THE SAFE MINDSET OF MANAGERS, SHIFTBOSSES AND MINERS ON A PLATINUM MINE IN SOUTH AFRICA

by

Nicolaas Jansen van Rensburg

Dissertation

Submitted in fulfilment of the requirements for the degree

MAGISTER PHILOSOPHIAE

Employment Relations

in the Department of Human Resources Management in the Faculty of Management at the

Study Leader: Prof. Karel J. Stanz

November 2008
STATEMENT

I certify that the dissertation submitted by me for the degree M.Phil. at the University of Johannesburg is my own independent work and has not been submitted for purposes of a degree at any another faculty or University.

Nicolaas Jansen van Rensburg

November 2008
Dedication

I wish to dedicate this study to all of those brave men and women who earn their daily living deep within mother earth in the pursuit of wealth...
ACKNOWLEDGEMENTS

To my Lord and Saviour Within and through Whose grace I live
everyday…

I wish to express my sincere gratitude and appreciation to the
following people and institutions who made this study possible:

- The University of Johannesburg where I am fortunate to have conducted all my postgraduate studies.
- Prof. Karel J. Stanz, my study leader, for his latitude and patience – you really teach people how to fish…
- Prof. Petri Schutte who allowed me the application of the Safe Human Mindset Model and Measuring Instrument and Hugo Botha for his assistance with the initial report to the mine. Petri, you became a friend and I appreciate our continuous relationship. You really are a pioneer in research of safety in the Mining Industry in South Africa.
- Anneli Hardy and Statcon at the University of Johannesburg for the statistical processing and analysis of the data.
- Prof. Faans Steyn and Dr. Suria Ellis at the Department of Statistics at the University of North-West Potchefstroom Campus for the statistical processing and validation of data in a professional manner. Your advice is always invaluable.
- Proff. Kobus Slabbert, Jos Coetzee and Dawie Smith who collectively put me on track.
- Chris Griffith who approved the study and Mark Farren who supported the study on the mine.
- Chris Kern for his continued understanding and support.
- Lilly Timms and Santa Kukard for their professional typing.
- Sharon Ramborosa for her support and meticulous proofreading.
- The Managers, Mine Overseers, Shiftbosses and Miners who participated with diligence and honesty in the application of the study.
- The library staff at the University of Johannesburg for their assistance.
• My friends and family for their interest and support.
• Mr. Frans Gräbe, the vice principal at Ermelo High School who persuaded me to follow a tertiary education.
• My late parents: Another milestone achieved in life’s journey…
• My two sons Bert and Nicie. You really can achieve anything if you put your head into it. This I proved to you.
• To my wife Antjie. Thanks for your loving understanding and moral support in this continuing search…

“Om baie heuning te eet, is nie goed nie, maar om swaar sake na te speur is ‘n eer” - Spreuke 25:27
ABSTRACT
THE SAFE MINDSET (SAFETY MOTIVATIONAL INTENT) OF MANAGERS,
SHIFTBOSSES AND MINERS ON A PLATINUM MINE IN SOUTH AFRICA

By : Nicolaas Jansen van Rensburg
Promoter : Prof. Karel. J. Stanz
Department : Department of Human Resource Management
            Faculty of Management Sciences
            University of Johannesburg
Degree : M. Phil.
Date : November 2008

Background
The mining industry in South Africa is in a process of transformation, which can be ascribed to various influences. First and foremost is the process of the conversion of mineral rights, employment equity and black economic empowerment. The ethnic distribution of mining employees at the time of the study reflected that Managers were predominantly white, the majority of Shift bosses were white and Miners were predominantly black.

Central to the transformation process is maintaining and improving production output in a safe manner.

Leadership in addition also impacts on health and safety in the workplace and the process to transform the organisation to world-class status commences with leadership.

Transforming health and safety in the organisation to world-class status is a leadership imperative.
The fatality rates in South African mines are continuously being addressed not only through initiatives from the Chamber of Mines of South Africa, but also through the various mining houses.

The introduction of the Mine Health and Safety Act and Regulations 29 of 1996 made a profound impact on health and safety management on South African Mines. The introduction of blasting certificate holders replaced the scheduled person (contract miner). Various mining houses grasped the opportunity and trained their own miners from previously disadvantaged communities. This also assisted in achieving transformation objectives.

The fatalities on platinum mines in South Africa since 1995 have remained constant up to 2007 although a slight decrease is reported. Nevertheless, injuries and fatalities in South African mines are attracting negative attention from society and the investment community. This is not in the interest of the mining industry.

Research indicates that unsafe behaviour contributes 87% and more to incidents and injuries (including fatalities) on mines. The study of behaviour as a contributing factor in organisational safety is a relatively young science since the first reported studies in the 1980's. Research in this domain strives to develop an understanding of behaviour as a contributing factor in organisational safety.

**Problem Statement**

Injuries and fatalities are a result of a low safety motivational mindset (intent) originating at Manager, Shiftboss and Miner status (production leader levels) within the target organisation.

**Research Objectives**

The objectives of this study are divided into those of a literature study as well as empirical observations. In terms of the empirical research objectives, secondary objectives are also identified.

The primary literature objective is twofold:
The first is to discuss the World-Class organisation in theoretical context and the second is to discuss the theoretical framework of the Safe Human Model.

**The primary empirical research objective** is to apply the Safe Human Measuring Instrument (SHMI was developed to measure the various constructs of the Safe Human Model) to the three leader levels of Managers, Shiftbosses and Miners in the target organisation with the aim of identifying differences in their respective mindsets with regards to safety.

**Literature Research**
The literature review of the World-Class organisation identified contemporary studies in leadership, business ethics and corporate governance as post-1998 developments (when the original world-class model was founded) in terms of the World-Class organisation.

The literature review revealed that there was no integrated approach to a safe mindset of production leaders and subsequently the Safe Human Mindset Model™ was theoretically discussed together with the constructs and sub-constructs of the model.

**Empirical study**
The SHMI measures the constructs of relationship credibility, climate and culture, which collectively form the Safe Human Mindset™ Model.

The SHMI is a statistically validated measuring instrument that measures the safe mindset of the target population.

The various sub-constructs of relationship credibility, climate and culture are also supported by an appropriate number of statements (items) in the SHMI. The SHMI was administered to all the Managers, Shiftbosses and Miners in the target population. The total population for each of the three leader groups were included in the study Managers (N1=18), Shiftbosses (N2=28) and Miners (N3=60), Total (N=106).
The study was conducted on three levels:

The first level entailed the overall SHMI where the three leader levels were compared in terms of their responses subsequent to detailed statistical analysis.

The second level entailed the three main constructs of relationship credibility, climate and culture, which collectively form the SHMI. The three leader levels were compared in terms of their responses to the three main constructs subsequent to detailed statistical analysis.

The third level entailed the sub-constructs of the main constructs namely:

- Relationship credibility
  - Trust
  - Caring Support
  - Ownership
- Climate
  - Physical environment
  - Safety intent
- Culture
  - Values
  - Beliefs

The three leader levels were compared in terms of their responses on the third level of analysis subsequent to detailed statistical analysis. Only sub-constructs which yielded Cronbach-Alpha values of > .7 were subjected to statistical analysis.

The sub-constructs of culture (values and beliefs) were not subjected to statistical analysis since no statistical difference with regards to culture existed amongst the three leader levels.

**Study Design and Methodology**

The study is quantitative by nature with the aim of establishing the safe mindset (safety motivational intent) of Managers ($N_1=18$), Shiftbosses ($N_2=28$) and Miners...
Total (N =106) in the target organisation. The target organisation is a platinum mine with a total workforce of 7300 employees. The mine is situated in the North West Province in South Africa. Since the target organisation is relatively young in operation, the production leaders participated willingly and enthusiastically because safety formed the focal point of the research.

The SHMI consists of a 60 item -4 point- Likert-type scientifically validated questionnaire. All respondents completed the SHMI individually in a controlled environment free from disturbances. Responses included nominal data (responses to demographic questions). Ordinal data was obtained through the application of the SHMI to the three production leader levels.

Two demographic variables namely age and tenure were included. Gender and language were excluded since gender was not a factor for consideration and the target organisation is conversant in English. With the aim of addressing the study objectives, the research process consisted of the following steps:

Research Process

Step 1
A comprehensive literature review of both the World-Class organisation and the Safe Human Mindset Model was undertaken. The aim was to build a common frame of reference regarding what constitutes World-Class and the Safe Human Mindset.

Step 2
The Safe Human Mindset Survey (the measuring instrument) was administered to the Managers, Shiftbosses and Miners (three production leader levels), on a platinum mine (the target organisation). The application of the measuring instrument (SHMI) generated a set of data.

Step 3
The data was statistically analysed by the statistical Consultation Service (STATCON) at the University of Johannesburg (UJ) using the SPSS for Windows statistical programme.
The original data set (previous application on mines) of the Safe Human Mindset Model™ was administered by the Department of Statistics at the University of North-West (Potchefstroom Campus) using the SAS statistical analysis programme.

The aim of this study is to statistically (empirically) determine the results (The Safe Mindset) of the application of the SHMI on the three production leader levels. The results will be used to test hypotheses and identify areas for development to eliminate incidents and fatalities on the mine.

**Step 4**
The results will be analyzed and interpreted with the intention of making recommendations to address identified areas for development within the three leader levels in the target organisation. Possible future research opportunities emanating from the study are also provided.

**Statistical Analysis**
The SHMI was administered to the total population of the three leader levels and the results were subjected to inferential and Multiple Comparisons Post Hoc Tests statistical analysis.

The data was captured on an Excel spread sheet that the Statcon Department of the University of Johannesburg analysed by means of the SPSS for Windows statistical package.

The University of North-West (Potchefstroom Campus) is the custodian of the statistical data of the Trade Mark Safe Human Model applying the SAS System for Windows Release 9.1 TS level 1 M3 programme. The analysis of the previous application of the SHMI reconfirmed the SHMI as a scientifically validated measuring instrument.

The analysis of the data in this study was conducted in two phases.

- Phase One entailed capturing, processing and application of descriptive statistics.
Phase Two entailed the application of inferential statistical analysis (Parametric and non-parametric tests) and Multiple Comparisons Post Hoc tests for purposes of testing hypotheses.

- **Phase One**
  A univariate approach to data processing, analysis and interpretation was applied with the emphasis on descriptive statistics.
  - The frequency distribution indicated a normal distribution, which was slightly negatively skewed with a leptokurtic inclination. Both the mean and standard deviation were calculated per item, as well as the overall Safe Human Mindset Index, the constructs and sub-constructs. The result of the factor analysis of the application of the SHMI prior to this study (N=11929) retained twelve factors that could explain 75.2% of the variance in data with a minimum communality of .55 and maximum communality of .85. The average communality of .74 is > .5. The result of the factor analysis of this study (N=106) retained seventeen factors that could explain 72% percent of the variance in data. The communalities varied between a minimum of .61 and maximum of .79 with an average communality of .66 which is > .5.

The reliability of the measuring instrument is therefore confirmed. The difference between the extracted factors could be ascribed to the small sample used in this study and since this study is exploratory by nature, a confirmative or comparative approach to data was not conducted.

- With regards to reliability the previous application of the SHMI reflected a Cronbach coefficient alpha value of .78 > .7.
  The Cronbach Coefficient - Alpha values obtained in this study for the overall SHMI yielded .89 and when items were reflected, an overall Cronbach Coefficient - Alpha Value of .911 was obtained. The SHMI is therefore both a valid and reliable measuring instrument to determine the Safe Mindset of the target population.
• **Phase Two**

A three level approach was followed in the application of the inferential and Multiple Comparisons Post Hoc Tests statistical procedures on the three leader levels (Managers, Shiftbosses and Miners).

- The first level of analysis focused on the overall Safe Human Mindset Index.
- The second level of analysis concentrated on the constructs of the Safe Human Model namely relationship credibility, climate and culture and
- The third level of analysis dwelt on the sub-constructs of trust, caring support, ownership, physical environment and safety intent.

The sub-constructs of culture, namely, values and beliefs were not subjected to further analysis since statistical analysis revealed that no statistical difference between the Managers, Shiftbosses and Miners existed with regards to culture. The constructs of relationship credibility, climate and culture yielded Cronbach-Coefficient Alpha values of >.7.

Only sub-constructs which yielded Cronbach Coefficient - Alpha values of >.7 were subjected to statistical analysis. The small sample size (N = 106) of the three leader levels is a contributing factor to Cronbach Coefficient - Alpha values <.7 obtained for the sub-constructs respect, attitude towards the job and attitude towards the company.

The following statistical procedures were applied in the three levels of statistical analysis.

- One-Way ANOVA
- Levene’s Test of Equality of Error Variances (a) to determine homogeneity or heterogeneity of variance
- ANOVA F-ratio (homogeneity of variance occurred) Test of Between Subject Effects
- Brown-Forsythe Robust Test of Equality of Means Test (heterogeneity of variance occurred)
• Kruskal-Wallis Test Ranks and Test statistics (a, b) non parametric equivalent of ANOVA
• Multiple Comparisons Post Hoc Tests (Scheffé when homogeneity of variance occurred and Dunnett T3 when heterogeneity of variance occurred).

The integrative Hypothesis (H1) that formed the basis of this study was; 'there is no statistically significant difference between the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners' in the target organisation.

Nine sub-hypotheses were formulated with regards to the constructs and sub-constructs to enable in-depth analysis of the data within the three levels of statistical analysis (discussed above).

The key findings of the study are divided into the two main objectives of the study, namely, literature and empirical study objectives.

• The literature objective was to discuss the World-Class model from a theoretical perspective and secondly to describe the theoretical base of the Safe Human Mindset Model (constructs which are measured by The Safe Human Measuring Instrument (SHMI).

It is proposed that the aspects of Corporate Governance and Business Ethics be included in Business Results in the World-Class model. These aspects were developments subsequent to the introduction of the World-Class model in 1999.

• The empirical study objectives were addressed in a two-phased approach:
  • Phase One focused on descriptive statistics.
    The SHMI is both a valid and reliable instrument that measures the various constructs of the Safe Human Mindset Model.
    The SHMI has construct, factorial and content validity.
    The reliability analysis indicated a Cronbach Alpha Coefficient of .911.
Phase Two focused on the application of inferential and Multiple Comparisons Post Hoc Tests in the three levels of statistical analysis with the aim of testing the nine stated sub-hypotheses.

With regards to the three levels of statistical analysis, a significant statistical difference exist between Manager, Shiftboss and Miner level with the exception of culture (second level of statistical analysis) where no statistically significant difference between Manager, Shiftboss and Miner exist.

- With regards to the first level of statistical analysis (the differences in the overall safe mindset or safety motivational intent), a significant statistical difference exists between Managers and Miners originating at Shiftboss level.
- With regards to the second level of statistical analysis, a significant statistical difference exists between Managers and Miners with regards to relationship credibility originating at Shiftboss level. With regards to climate, significant statistical differences exist between Managers and Shiftbosses as well as Managers and Miners originating at Manager level. No statistical significant differences exist between Manager, Shiftboss and Miner levels with regards to culture.
- The third level of statistical analysis revealed significant statistical differences between Manager and Shiftboss as well as Manager and Miner levels with regards to trust. With regards to ownership significant statistical differences exist between Manager and Miner as well as Shiftboss and Miner levels originating at Shiftboss level. A significant statistical difference exists between Manager and Miner level with regards to the physical work environment originating at Shiftboss level. With regards to safety intent a significant statistical difference exists between Manager and Miner level originating at Shiftboss level.

Conclusion and Recommendations
The results of the analyses indicated that both the literature and empirical objectives of the study have been realised.
The study has theoretical, methodological and practical significance. From a theoretical perspective it contributes to the literature on the World-Class model. From a methodological point of view, the results of the study can be utilised to develop the organisation through a structured approach.

From a practical perspective, attitudes of leaders can be identified and addressed through behaviour modification processes and associated systems applicable to safe production. From an organisational perspective, relevant Human Resource Development as well as Employment Relations policies and interventions can be implemented together with health and safety practices that would contribute to sustainable performance and the elimination of injuries and fatalities.

A significant limitation of the study is that it was conducted in one organisation, however the nomothetic value of this study is apparent to similar high-risk organisations with regards to occupational health and safety.

Considering the recommendations that were made in terms of theoretical, methodological and practical perspectives, the following suggestions for potential research opportunities are forwarded:

- The interrelation between Corporate Head Office and mine(s) with regards to Health and Safety and a Safe Human Mindset.
- The Safe Human Mindset of leaders and workers in order to gain a broader picture of Safe Human Mindset in an organisation.
- The barriers to an organisational Health and Safety Strategy in the effort to effectively implement an Occupational Health and Safety Strategy in an organisational context.
- The impact of leadership and joint governance in the conflict of interest between production and safety.
- The introduction of Broad Based Black Economic Empowerment, Employment Equity or Women in Mining (Mining Charter requirements-legislation) policies and their impact on Occupational Health and Safety. This is also linked to the concepts of diversity and transformation. A
diverse workforce due to transformation will result in a broadening of organisational culture (values and beliefs).

The findings of this study not only provide valuable insight into the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners, but also provides methodological and practical contributions towards an improved safe mindset of the identified leaders.
# TABLE OF CONTENTS

Statement .......................... ii  
Acknowledgements .................. iv  
Abstract ............................. vi  
Table of Contents .................. xviii  
List of figures ...................... xxv  
List of Tables ....................... xxvi  
List of references ................. 480

## CHAPTER 1: INTRODUCTION TO THE RESEARCH ................................. 1

1. Introduction ................................................................. 2  
1.1 The reality of globalisation .............................................. 3  
1.2 The concept and meaning of ‘World-Class’ ......................... 7  
1.3 Values as building blocks in joint governance ................. 10  
1.4 The Safe Human Mindset .............................................. 12  
1.4.1 Relationship credibility .............................................. 13  
1.4.2 Climate (work life experience) ................................. 13  
1.4.3 Safety Culture ....................................................... 13  
1.4.4 Values and beliefs .................................................. 14  
1.5 Background to the Research Problem .............................. 14  
1.6 Problem Statement ..................................................... 16  
1.7 Research Questions ..................................................... 16  
1.8 Empirical Study Objectives ............................................ 17  
1.8.1 Primary Objectives .................................................. 17  
1.8.2 Secondary objectives .............................................. 17  
1.9 Hypotheses ............................................................... 18  
1.10 Research design ........................................................ 19  
1.10.1 Research method ................................................... 19  
1.10.2 Sampling ............................................................. 20  
1.10.3 Research process ................................................... 20  
1.10.4 Method of data collection and processing ................... 21  
1.11 Limitations of the study ................................................. 22  
1.12 Chapter Layout ........................................................ 23  
1.13 Conclusion ............................................................. 24
CHAPTER 2: LITERATURE REVIEW ............................................................ 25

2.1 Introduction ............................................................................................... 26

2.2 The World-class Class organisation ......................................................... 26
  2.2.1 Direction ............................................................................................. 29
    2.2.1.1 Leadership .................................................................................... 29
      2.2.1.1.1 Introduction to leadership ....................................................... 29
      2.2.1.1.2 Leadership and organisational strategy .................................. 36
      2.2.1.1.3 Leadership and organisational change ................................... 46
      2.2.1.1.4 Leadership and organisational culture and climate ................. 66
        2.2.1.1.4.1 Introduction ....................................................................... 66
        2.2.1.1.4.2 Organisational culture and climate.................................... 66
      2.2.1.1.5 Leadership Care and Growth................................................. 75
      2.2.1.1.6 Transactional and Transformational Leadership .................... 84
        2.2.1.1.6.1 Introduction ...................................................................... 84
        2.2.1.1.6.2 Transactional Leadership ................................................. 84
        2.2.1.1.6.3 Transformational Leadership ........................................... 88
      2.2.1.1.7 Contemporary studies in leadership....................................... 92
    2.2.1.2 Customer - Centred Strategy....................................................... 105
  2.2.2 The delivery system ........................................................................... 114
    2.2.2.1 The organisational fabric ............................................................ 114
      2.2.2.1.1 Lean organisation ................................................................. 115
      2.2.2.1.2 Partnering ............................................................................. 121
      2.2.2.1.3 Information architecture........................................................ 122
    2.2.2.2 Joint Governance ...................................................................... 125
      2.2.2.2.1 Introduction .......................................................................... 125
      2.2.2.2.2 Participation......................................................................... 126
      2.2.2.2.3 Team- based operations....................................................... 132
      2.2.2.2.4 Learning............................................................................... 138
      2.2.2.2.5 Remuneration and performance .......................................... 143
      2.2.2.2.6 Empowerment ..................................................................... 148
      2.2.2.2.7 Values ................................................................................. 152
      2.2.2.2.8 Communication ................................................................... 157
  2.2.3 Business Results ............................................................................. 168
    2.2.3.1 Introduction................................................................................ 169
2.3.2.2.7 Frontline visibility ................................................................. 267
2.3.2.3 Respect .................................................................................... 269
  2.3.2.3.1 Dignity ................................................................................ 270
  2.3.2.3.2 Openness .......................................................................... 271
  2.3.2.3.3 Approachability ................................................................. 272
  2.3.2.3.4 Confidentiality ................................................................. 273
  2.3.2.3.5 Courtesy ............................................................................ 274
  2.3.2.3.6 Helpfulness ....................................................................... 275
  2.3.2.3.7 Friendliness ..................................................................... 275
2.3.2.4 Ownership ............................................................................. 276
  2.3.2.4.1 Information quality ............................................................ 276
  2.3.2.4.2 Truth ............................................................................... 278
  2.3.2.4.3 Job security ....................................................................... 279
  2.3.2.4.4 Creative scope .................................................................. 281
  2.3.2.4.5 Willingness to listen .......................................................... 282
  2.3.2.4.6 Backing .......................................................................... 283
  2.3.2.4.7 Future prospects ............................................................... 284
2.3.3 Work life experience ................................................................. 285
  2.3.3.1 Introduction .......................................................................... 285
  2.3.3.2 Workforce satisfaction .......................................................... 288
    2.3.3.2.1 Attitude towards the job (job satisfaction) ......................... 288
    2.3.3.2.2 Attitude towards the company (company satisfaction) ...... 291
  2.3.3.3 Work environment and perceived supportive relationships ...... 294
    2.3.3.3.1 Physical work environment ............................................. 294
      2.3.3.3.1.1 Safety housekeeping .................................................. 297
      2.3.3.3.1.2 Safety meetings ......................................................... 297
      2.3.3.3.1.3 Safety inspections ...................................................... 298
      2.3.3.3.1.4 Recognise safe performance ...................................... 298
      2.3.3.3.1.5 Safety feedback ......................................................... 299
      2.3.3.3.1.6 Safe working conditions ........................................... 301
      2.3.3.3.1.7 Understanding safety goals ....................................... 302
    2.3.3.3.2 Safety intent .................................................................... 303
      2.3.3.3.2.1 Trust amongst employees ........................................... 303
      2.3.3.3.2.2 Communication .......................................................... 305
2.3.3.2.3 Management support ....................................................... 305
2.3.3.2.4 Involvement in safety matters .............................................. 306
2.3.3.2.5 Friendly atmosphere ........................................................ 308
2.3.3.2.6 Valued human beings ...................................................... 309

2.3.4 Culture: Behaviour in company context .................................................. 310
2.3.4.1 Introduction .................................................................................. 310
2.3.4.2 The nature of organisational culture ............................................ 311
2.3.4.3 Factors that determine formation and choice of culture ............... 318
2.3.4.4 Role and importance of culture .................................................... 322
2.3.4.5 Function of organisational culture ............................................... 325
2.3.4.5.1 Establishing standards ........................................................... 327
2.3.4.5.2 Culture act as control measure .............................................. 327
2.3.4.6 Culture and organisational safety ................................................ 328
2.3.4.7 Integrating organisational culture and occupational safety ........... 329
2.3.4.8 Occupational health and safety .................................................... 333
2.3.4.8.1 Introduction ............................................................................ 333
2.3.4.8.2 Defining occupational health and safety ................................ 334
2.3.4.8.3 Concepts associated with occupational health and safety .... 335
2.3.4.8.4 Causes of occupational injuries .............................................. 336

2.4 Conclusion ................................................................................................. 339

CHAPTER 3: EMPIRICAL RESEARCH METHODOLOGY ......................... 341
3.1. Introduction ............................................................................................... 342
3.2 Research design ....................................................................................... 343
3.2.1 Ontology ............................................................................................... 343
3.2.2 Epistemology ........................................................................................ 344
3.2.3 Methodology ......................................................................................... 344
3.2.4 The use of data .................................................................................... 344
3.2.5 Research design choice ....................................................................... 345
3.3 The Safe Human Mindset Model on which the SHMI is based ............ 345
3.4 The Measuring Instrument ....................................................................... 346
3.5 Sample ....................................................................................................... 350
3.6 Research process ..................................................................................... 350
3.7 Statistical analyses applied in the study .................................................. 351
### 3.7.1 Approach to be followed ................................................................. 356
### 3.7.2 Factor analytic data mode ................................................................. 356
### 3.7.3 Criteria to determine number of factors ........................................... 356
### 3.8 Conclusion ......................................................................................... 359

#### CHAPTER 4: EMPIRICAL RESULTS OF THE STUDY .......................... 360

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Introduction</td>
<td>361</td>
</tr>
<tr>
<td>4.2 Objective of the study</td>
<td>361</td>
</tr>
<tr>
<td>4.3 Phase One: Sampling, frequency and descriptive studies</td>
<td>362</td>
</tr>
<tr>
<td>4.3.1 Sample statistics</td>
<td>362</td>
</tr>
<tr>
<td>4.3.2 Frequency analysis</td>
<td>363</td>
</tr>
<tr>
<td>4.3.2.1 Introduction</td>
<td>363</td>
</tr>
<tr>
<td>4.3.3 Item descriptive statistics for the SHMI (Safe Human Measure Instrument)</td>
<td>367</td>
</tr>
<tr>
<td>4.3.4 Results of the factor analysis</td>
<td>371</td>
</tr>
<tr>
<td>4.3.5 Results of the reliability analysis</td>
<td>375</td>
</tr>
<tr>
<td>4.4 Phase Two</td>
<td>383</td>
</tr>
<tr>
<td>4.4.1 Testing of hypotheses</td>
<td>383</td>
</tr>
<tr>
<td>4.4.1.1 The first level of statistical analysis</td>
<td>386</td>
</tr>
<tr>
<td>4.4.1.2 The second level of statistical analysis of the constructs relationship credibility, climate and culture</td>
<td>390</td>
</tr>
<tr>
<td>4.4.1.3 Third level of statistical analysis</td>
<td>407</td>
</tr>
<tr>
<td>4.5 Summary of Main Findings</td>
<td>436</td>
</tr>
<tr>
<td>4.5.1 Application of the SHMI</td>
<td>436</td>
</tr>
<tr>
<td>4.5.2 Conclusion Phase Two</td>
<td>440</td>
</tr>
<tr>
<td>4.6 Conclusion</td>
<td>440</td>
</tr>
</tbody>
</table>

#### CHAPTER 5: DISCUSSION OF RESEARCH RESULTS .............................. 442

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Introduction</td>
<td>443</td>
</tr>
<tr>
<td>5.2 Review of the study</td>
<td>443</td>
</tr>
<tr>
<td>5.3 Key results of the literature review</td>
<td>443</td>
</tr>
<tr>
<td>5.3.1 The World-Class organisation</td>
<td>444</td>
</tr>
<tr>
<td>5.3.2 The Safe Human Mindset Model</td>
<td>444</td>
</tr>
<tr>
<td>5.4 Key empirical findings</td>
<td>444</td>
</tr>
<tr>
<td>5.4.1 Phase One: empirical findings</td>
<td>445</td>
</tr>
<tr>
<td>5.4.1.1 Descriptive statistics</td>
<td>445</td>
</tr>
</tbody>
</table>
5.4.1.2 Factor analysis ................................................................. 445
5.4.1.2.1 Validity ............................................................................. 445
5.4.1.2.2 Reliability ........................................................................ 445
5.4.2 Phase Two ............................................................................ 447
5.4.2.1 Level One ........................................................................... 448
5.4.2.2 Level Two ........................................................................... 449
5.4.2.2.1 Relationship credibility ..................................................... 449
5.4.2.2.2 Climate .......................................................................... 450
5.4.2.2.3 Culture .......................................................................... 451
5.4.2.3 Level Three ........................................................................ 452
5.4.2.3.1 Trust .............................................................................. 452
5.4.2.3.2 Caring support ................................................................. 452
5.4.2.3.3 Ownership ................................................................. 453
5.4.2.3.4 Physical environment ..................................................... 454
5.4.2.3.5 Safety Intent ................................................................. 454
5.4.3 Originating levels pertaining to the differences in the safe
mindset of leaders ........................................................................... 455
5.4.4 Conclusion: Phase Two .......................................................... 456
5.4.5 Conclusion ........................................................................... 457

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS ............ 459

6.1 Introduction .............................................................................. 460
6.2 A brief overview of the study ..................................................... 461
  Chapter 1 .................................................................................. 461
  Chapter 2 .................................................................................. 462
  2.2 The World-Class organisation ................................................. 462
  2.3 The Safe Human Mindset Model ............................................. 462
  Chapter 3 .................................................................................. 462
  Chapter 4 .................................................................................. 463
  Chapter 5 .................................................................................. 463
6.3. Key findings of the study .......................................................... 464
  6.3.1 Action Research as an Organisational Development Process .. 465
6.4 Recommendations ................................................................... 467
  6.4.1 Recommendations in terms of theory ................................... 467
  6.4.2 Recommendations in terms of methodology ....................... 469
6.4.3 Recommendations in terms of practice ............................................ 472
6.5 The value contribution of the study ....................................................... 474
   6.5.1 Theoretical contribution ............................................................... 474
   6.5.2 Methodological contribution ......................................................... 475
   6.5.3 Practical contribution ................................................................. 475
6.6 Limitations of the study ....................................................................... 476
6.7 Suggestions for future research ........................................................... 477
6.8 Conclusion .......................................................................................... 478

LIST OF FIGURES

Figure 1-1: A model of the world-class organisation ..................................... 9
Figure 2-1: OHSAS 18001 System ............................................................... 44
Figure 2-2: Eight step process to affect major change ................................... 48
Figure 2-3: The change cycle ..................................................................... 51
Figure 2-4: The accident iceberg ............................................................... 60
Figure 2-5: The accident behaviour safety cycle ......................................... 61
Figure 2-6: Intention and behaviour .......................................................... 63
Figure 2-7: Intent: Giving or taking ............................................................ 76
Figure 2-8: Path – Goal Theory ................................................................. 79
Figure 2-9: GENCOR Method of Instruction .............................................. 81
Figure 2-10: The Fiedler Model ................................................................. 86
Figure 2-11: Hersey and Blanchard’s situational leadership ......................... 88
Figure 2-12: Leadership from the inside out .............................................. 93
Figure 2-13: Emotional Intelligence: Four Capabilities .............................. 100
Figure 2-14: Six Leadership Styles ............................................................ 102
Figure 2-15: Fundamentals of a customer centred strategy ......................... 106
Figure 2-16: Management of the organisational fabric ................................ 114
Figure 2-17: Matching supply chains with products .................................... 118
Figure 2-18: Four generic strategy options ............................................... 126
Figure 2-19: World-class remuneration ..................................................... 143
Figure 2-20: Remuneration as transformation driver .................................... 147
Figure 2-21: Six steps to values-driven leadership ....................................... 157
Figure 2-22: The Johari Window ............................................................... 161
Figure 2-23: Simplified Model of Consumer behaviour ............................ 197
LIST OF FIGURES

Figure 2-24: A Model of Competitive advantage.............................................. 219
Figure 2-25: Corporate Governance ................................................................. 232
Figure 2-26: Implementation Approach to World-Class status............................ 243
Figure 2-27: The Safe Human Mindset Model ................................................ 248
Figure 2-28: The Cycle of Respect .................................................................. 270
Figure 2-29: Manifestations of Culture at Differing Layers of Depth ............... 313
Figure 6-1: The Safe Human Model ................................................................. 459
Figure 6-2: Chapter Process Sequence........................................................... 460
Figure 6-3: Action Research Organisational Development Model ................. 465
Figure 6-4: The Employee Safety Growth Chain ............................................ 468
Figure 6-5: Continuous Improvement Strategy ............................................. 470
Figure 6-6: The interrelationship between Risk and Safety ......................... 470

LIST OF TABLES

Table 2-1 Number of fatalities in the platinum industry .................................. 59
Table 4-1 Frequency table of respondents .................................................... 363
Table 4-2 Frequency table of Tenure in the Organisation – all respondents ....... 364
Table 4-3 Frequency table of Tenure for Managers in the Organisation......... 364
Table 4-4 Frequency table of Tenure of Shiftbosses in the organisation ...... 365
Table 4-5 Frequency table of Tenure of Miners in the organisation ............. 365
Table 4-6 Frequency table of Age of all respondents. ................................ 365
Table 4-7 Frequency table of Age of Managers in the organisation ............ 366
Table 4-8 Frequency table of Age of Shiftbosses in the organisation .......... 366
Table 4-9 Frequency table of Age of Miners in the organisation ................ 367
Table 4-10 Item Descriptive Statistics of the SHMI ........................................ 368
Table 4-11 Test of normality – Kolmogorov - Smirnov (a) ................................. 370
Table 4-12 Factor analysis: Total variance explained ...................................... 371
Table 4-13 Factor Analysis: Communalities .................................................... 373
Table 4-14 Case Processing Summary ............................................................. 375
Table 4-15 Reliability statistics ......................................................................... 376
Table 4-16 Item total statistics for the SHMI .................................................. 376
Table 4-17 Reliability studies: reflected items ............................................... 379
Table 4-76 ANOVA –F-ratio comparison of Between-subject Effects for the three leader groups and Ownership ................................................. 421
Table 4-77 Kruskal-Wallis Test Ranks ........................................................................ 422
Table 4-78 Kruskal-Wallis Test statistics (a, b)............................................................ 422
Table 4-79 Scheffé Multiple Comparisons Post Hoc Test ........................................ 423
Table 4-80 Case processing Summary – Physical Environment ............................... 424
Table 4-81 Reliability Statistics – Physical Environment ......................................... 425
Table 4-82 Item Total Statistics – Physical environment .......................................... 425
Table 4-83 Descriptive Statistics for the three leader group levels and Physical Environment ................................................................. 426
Table 4-84 Levene's Test of Equality of Error Variances (a) – Physical Environment .................................................................................. 426
Table 4-85 Brown-Forsythe Robust Test of Equality of Means .............................. 427
Table 4-86 Kruskal-Wallis Test Ranks ....................................................................... 427
Table 4-87 Kruskal-Wallis Test statistics (a, b)............................................................ 427
Table 4-88 ANOVA -F-ratio comparison of Between Subject Effects for the three leader groups and Physical Environment ..................... 428
Table 4-89 Dunnett T3 Multiple Comparisons Post Hoc Test ................................ 428
Table 4-90 Case Processing Summary – Safety Intent ............................................. 430
Table 4-91 Reliability Statistics - Safety Intent ......................................................... 431
Table 4-92 Item Total Statistics – Safety Intent ....................................................... 431
Table 4-93 Descriptive Statistics for the three leader group levels and Safety Intent ............................................................................. 431
Table 4-94 Levene's Test of Equality of Error Variances (a) – Safety Intent .......... 432
Table 4-95 Brown-Forsythe Robust Test of Equality of Means .............................. 432
Table 4-96 Kruskal-Wallis Test – Ranks .................................................................... 433
Table 4-97 Kruskal-Wallis Test Statistics (a, b)............................................................ 433
Table 4-98 Dunnett T3 Multiple Comparisons Post Hoc Test ............................... 433
Table 4-99 Summary of findings ............................................................................. 435
Table 5-1 Originating levels pertaining to the differences in the safe mindset of leaders ........................................................................... 455
CHAPTER 1

Introduction to the Research

Plans are Nothing, Planning Is Everything
- General Dwight D. Eisenhower
CHAPTER 1: INTRODUCTION TO THE RESEARCH

1. Introduction
This chapter introduces the research and places the total study in context by providing a framework for the problem under investigation. A brief description of the literature, the study, background to the research problem and specific questions that generated the study is provided. The objectives and research hypothesis are stated together with an overview of the intended research methodology inclusive of the measuring instrument, sampling, data gathering and statistical methods applied. The value and limitations of the study are also discussed.

The mining industry in South Africa is constantly engaged in productivity and cost-improvement processes to improve performance with the aim to compete globally. The promulgation of the Mine Health and Safety Act 29 of 1996 (the Act) reinforced the interrelation between production and safety and made profound changes to the management of safety in the mines in South Africa. Employees have the right to refuse to work in unsafe conditions. Emphasis is placed on the improvement and maintenance of a safe working environment including safe working conditions and practices.

The Act also defines the specific responsibilities of the owner (employer) with regards to safety. Responsibilities and safety performances are reflected in the functioning of health and safety committees, safety representatives and designated duties and responsibilities for the various levels in the organisation. Compliance with the Act and the safety performance of a mine(s) is closely monitored by the Department of Minerals and Energy. Performance management is therefore a high priority, specifically where safety is concerned. Management as agents of the owner of a business are accountable for the performance of non-management employees according to Swanepoel (2003). This introduces the concept of performance management through the implied employment relationship between employer and employee.
Legitimacy and efficiency create competitive advantages through leadership who installs common values and management ensuring performance through a competent workforce (Esterhuysse, 2004). Profitability, liquidity and solvency are associated with organisational performance and are, according to Esterhuysse (2004) elements in the template for Corporate Governance. It stands to reason therefore that sound employment relations is a strategic management imperative integrative of performance excellence reflected in good Corporate Governance. In the mining industry, sound corporate governance includes the health and safety of employees.

Safety according to Haase (2003) is a moral licence to mine. The fatality rate in the platinum industry is morally unacceptable and Anglo American plc recently stated this publicly in London. This invites the negative attention of the global investment community, which is not in the best interest of the industry. Such negative publicity also dulls the competitive edge of an organisation and reduces its claim to world-class status. The effects of globalisation and the ability to compete in the global arena is thus the primary reason for an organisation to strive for ‘world-class’ status (Swanepoel, 2003).

1.1 The reality of globalisation

The new political dispensation in South Africa after 1994 plunged the country and the economy back into the global arena. This posed certain challenges in terms of meeting global standards and requirements. In his book “The Third Wave”, Toffler (1984) proposed that information technology was the third wave that swept through and was changing the world at a rapid rate. In the South African context, as a Third World developing country, this meant adapting inter alia the education system (over a generation or two) to enable people to deal with rapidly developing technology and to prepare new entrants into the labour market.

Castell (1999) confirmed Toflers’ advocation and states further that a new economy emerged over the past two decades. This economy had two distinctive characteristics, namely:

- it is global, because the production, consumption and circulation activities are organised on a global scale and
it is informational since the productivity and competitiveness of the role players in the economy depend on their capacity to access and provide knowledge rich information.

Slabbert (2003) defines globalisation as the rapid increase in cross border economic, social and technological exchange under conditions of free market capitalism. This process incorporates the best input in production as well as the latest technology and equipment by attracting the most and best investment from trans-national and foreign countries. The reality of globalisation according to Slabbert (2003) is evident in the expansion of global markets. In the platinum industry this is particularly evident in the growth in platinum jewellery markets in Asia and the USA in recent years.

Marquardt (1999) postulates that the global marketplace is brought about by technology, travel, trade and television and motivates his argument by stating that:

- Foreign investment in the USA has surpassed the $3 billion mark;
- One-third of the US economy is based on exports;
- Franchises, e.g. McDonalds, KFC, Xerox, Honda and many more operate globally.

It is an economic fact that the economic health of a country is measured by its trade account (import vs. export). Technology facilitates investment in global markets on a 24-hour basis, thus goods are imported and exported constantly.

Slabbert (2003) states that the impact of globalisation can be observed in many spheres in society:

- **Political**
  There is a change and impact on the sovereignty of the nation state since world economic debate is centred in world economic co-operation, promotion of free trade and controls to regulate unfettered international competition;

- **Economical**
The information age is facilitating fast economies through rapid investments and usage of trade opportunities. The influx and outflow of capital in countries is increasing as protective measures disappear.

- **Information technology**
  
  Our interconnected world is made increasingly boundary-less through telecommunications technology and global networks of competitors. Being part of a global network of communication is critical for success.

- **The world of work**
  
  Technology changes the speed and location of work, jobs become less descriptive but more roles defined as people become more mobile.

- A rapid growth of the middle class around the globe has been experienced as a result of the increase in world trade, improvement of global communications and expansion in the growth of small businesses.

Prinsloo, Moropodi, Slabbert and Parker (2000) report that South African business organisations fared exceptionally poorly when compared with other developed and developing countries. South African workers are rated the worst where training, development and competitive advantages are concerned. Relationships between labour and management fall within the bottom 25 percent for developed and developing nations. Prinsloo et al (1999) also point out that the competitiveness of South African companies’ rate below international benchmarks. According to the world competitive scoreboard as reported by Cornelius, Blake, and Paua, South Africa ranked 39th out of 49 countries researched in 2002. In addition, the Beeld (2007) reported the World Economic Forum (2005) as placing South Africa 39th out of 49 countries when measured for economic competitiveness indicating that the situation is not improving.

Labour and Mining Headlines (2007) reports that South Africa ranked 24 out of 30 countries according to the global talent index and ranked the lowest at attracting skilled people. Considering the comparative low competitiveness of South Africa and the impact that globalisation is exercising on South African organisations, the ability to survive and compete internationally becomes a strategic imperative. This introduces the concept of change, not only to survive, but to position organisations to compete effectively. Slabbert and Swanepoel (2003) state that the common factor
why companies failed in their endeavour was as a result of the failure to manage change, and the implications thereof.

The South African mining industry is presently undergoing fundamental changes and transformation due to legislation with regards to the conversion of mineral rights, health and safety, equity and economic empowerment. Hesselbein (1998) associates change with transformation and argues that for an organisation to reach their destination, banning the organisational hierarchy is a milestone that has to be achieved. This means removing people from their boxes in the organisational chart in order to facilitate strategic planning. Strategy is the responsibility of leadership in organisations hence Wickens (1999) states that leadership is about creating strategy, values, the sense of purpose when all members are inspired by and share them.

Kanter (1998) asserts that leaders and managers must change their strategic thinking if they are to guide their organisations to success. This is primarily done through unlocking the imagination in people. Kotter (2001) however distinguishes between leadership and management and agrees that both are distinctive and complementary systems of action and both are necessary for success in the increasingly complex and volatile business environment. Swanepoel and Slabbert (2003) also distinguish between transactional leadership (management) and transformational leadership and argue that both have an important role to play in modern organisations. Without transformational leadership organisations aspiring to world-class status are doomed to failure in ‘trying to fire a canon from a canoe!’

Schuitema (2004) associates caring support and growth with transformational leadership traits. Caring is associated with giving unconditionally with generosity and courage, whilst growth provides means, ability and accountability that will lead to high morale, high energy, independence and results. It is only when the above is reached, that the supervisor has legitimate power (Schuitema, 2004). This however is not the common case in South Africa.

Veldsman (2002) reported management style in organisations as rigid, bureaucratic, intimidating, and asserted that a lack of employee involvement in decision - making was prevalent in South Africa where companies do not meet the world-class criteria
for people management. This is typical of the traditional organisation, which is characterised by one centre control, hierarchical structures which are rigid and leads to a chain of command in a boss-subordinate relationship. Rhinesmith (1996) contrasts this type of organisation with the global company which is characterised by networking resulting in a variety of centres, which are organic, processed based, interactive resulting in various channels wherein decisions and authority is vested so that the way things are done reflect a specific organisational culture.

Veldsman (2003) describes organisational culture as the glue that holds organisations together and argues that a static culture may compromise the ability of an organisation to renew its competitive edge over time. Therefore not adapting or changing to circumstances may affect the organisations’ viability. Similarly, Tompkins (1995) associates a dying organisation with a dinosaur and archaic culture which is reflected in control analysis, slow decision making, optimisation as well as authoritarian bureaucracy.

Rhinesmith (1996) constitutes that for an organisation to be globally competitive, does not only mean survival in the global village, it also needs to have a corporate culture and value system that allows it to move resources anywhere to enable the organisation to achieve its greatest competitive advantage.

Considering the changing nature of work, Bews (2003) argues that restructuring in organisations and the way it is handled has an impact on the level of trust of employees. This affects teamwork severely since the effective functioning of teams depends on high levels of trust within an organisation.

Where empowerment was concerned, Slabbert and de Villiers (2003) state that in recent studies only 36 percent of companies with 500 employees and more were committed to providing a process of empowerment. When the above aspects are taken into consideration, the rationale for change becomes imperative if an organisation wants to survive and prosper.

In conclusion, low competitiveness, dying organisational culture as a result of an archaic management style, poor teamwork as a result of low levels of trust and failure to empower people to unleash their potential, is a direct call on leadership in
organisations to strategise, transform and position their organisations to proactively respond to changes and lead organisations to become world-class.

1.2 The concept and meaning of ‘World-Class’

Prinsloo et al (1999) states that ascending to ‘world-class’ in simplistic terms means becoming competitive with other business organisations in the global arena and this by implication means benchmarking performance. Nel (1994) is of the opinion that the ability to respond effectively to the prevailing challenges in a manner that surpasses that of the competitors is ‘world-class’.

Grates (1998) states that ‘world-class’ refers to a specific status of the best organisations in the world, whilst Owusu, (1999) and Kasul and Motwani, (1995) define it as the ability of an organisation to compete effectively in global markets and make profits, a view that is shared by Slabbert, Theron and Roodt (2001). This by implication means benchmarking performance and outputs on a continuous basis.

Kasul et al (1995) highlight certain characteristics of a world-class organisation as:
- Commitment of management
- Customer focus
- Advanced technology and
- Organisational flexibility.

Prinsloo et al (1999) recognise these characteristics but express a need for a comprehensive framework or model, which represents the building blocks of a world-class organisation.

The model integrates these building blocks and consists of:

- Leadership and a customer-centred strategy that provides direction.
- A delivery system that reflects the organisational fabric and joint governance, which influence the output since business results consist of organisational culture and financial measurements.
Rhinesmith (1996) suggests that a global competitive business organisation not only does business internationally, but in addition must also have a corporate culture and value system that allows it to move resources anywhere to achieve the greatest competitive advantage. The world-class organisations’ strategic intent is thus to deliver the highest quality product or service to the most profitable world markets at the lowest cost under changing market and competitive conditions (Rhinesmith, 1996).

Slabbert and Myburgh (2003a) postulate that values must be shared at the different organisational levels, thereby supporting vision and creating a network of common interest. Values as a binding block in joint governance are not only the foundation of any employment relationship according to Slabbert et al (1998) but also give direction to the behaviour, attitudes and perceptions of employees.

Slabbert et al (2003a) reason that the psycho-social contract is the departure point for managing by values. What is of concern in the South African context according to Prinsloo et al (1999) is the gap between the emotions and the state of peoples’ dissatisfaction as the socio-economic realities in the country continues to widen. It is to be expected then that these external factors will also impact on the internal work...
environment resulting in calls for the establishment of a psychological and social contract in the workplace (psycho-social contract) to accommodate reciprocal expectations from both employer and employee in the effort to enhance relationships.

Slabbert et al (2003a) describes the psycho-social contract as the invisible, unwritten set of reciprocal expectations evolving over time between the various parties that have an interest in the organisation. This interest presupposes a relationship either individually or collectively.

Slabbert et al (2003a) describe the employment relationship as a social exchange where two parties, employer and employee, cooperate to achieve mutual benefits. The formal employment contract however has an inherent inability to fully reflect the employment relationship, which results in the formation of informal contracts aimed at reducing individual uncertainty about undefined elements of the employment relationship. Slabbert et al (2003a) distinguish two forms of informal contracts namely the implied and psychological contracts. The former entails the mutual obligations between employer and employee, whilst the latter refers to the individual's belief regarding the terms and conditions of the agreement and is formed unilaterally according to the perceptions of the individual.

The psycho-social contract according to Slabbert et al (2003a) provides security and legitimacy between the parties and functions as a behavioural control mechanism in situations not regulated by formal agreements and is the departure point for managing by values.

1.3 Values as building blocks in joint governance

Prinsloo et al (1999) associates participative partnerships inter alia with being ‘world-class’ and state that employment relations strategies must direct the way in which people in the organisation are treated towards exercising the behaviours associated with being world-class.

Purcell and Ahlstrand (1994) propose four strategic options for managing employment relations and propose that joint efforts to create a caring environment,
joint problem solving, integrative bargaining, high trust and the treatment of trade unions as valued partners in humanising the workplace is the preferred strategy.

Swanepoel (1995) associates this strategy with joint governance and Prinsloo et al (1999) place values as a building block within the ambit of joint governance. With regards to the role of values, McEwan (2001) refers to values as the principles or standards people use individually or collectively to make judgments about what is important in their lives. Robbins (1996) explains values in terms of a specific mode of conduct and a value system as the ranking in terms of intensity and distinguishes between terminal values (desirable end status of existence) and instrumental values (preferable modes of behaviour).

Slabbert et al (2003a) postulate that core values are frames of reference to the behaviours, attitudes and perceptions of people and are the foundations of any employment relationship underpinned by reciprocal rights and responsibilities. In an organisational safety context Schutte (1998) associates values with standards, goals and philosophies that explain and analyse observable safety dimensions. These values are indicative of what behaviours are designed to achieve and indicate the desired consequences that behaviour seeks to elicit.

Slabbert et al (2003a) argue that values are inherent in a partnership contract or the formulation of an employment relationship since it serves as a code of conduct or behaviour for people in an organisation. They also emphasise the importance of core values that have intrinsic significance and importance for all employees (Slabbert et al, 2003a). Core values are not only the organisations’ one or two building blocks but are the most essential and enduring tenets according to Collins and Porras (1997).

It is up to the leadership in organisations to demonstrate and instil commitment that eventually install the desired organisational culture according to Slabbert et al (2000). Values can only be successfully adhered to when they are integrated with personal and core interpretations of values (Slabbert et al, 2003a).

The aspects of values and beliefs will be addressed in the theoretical framework proposed for the study.
It is common cause that the ascendance to world-class through the practice of joint
governance is more difficult in the South African context than the classic first world
countries due to aspects of language proficiency, literacy levels and diversity.

The majority of workers in South African organisations are black and the leaders are
traditionally white. There is a potential conflict of the values of African employees
with the core values of first world organisations which are still categorised by
autocracy, steep multi layered organisational structures and limited participation in
decision making (Slabbert et al, 2000). This has obvious employment relation
consequences. The call is on organisational leadership to address this imbalance to
ascend the organisation to world-class status.

Leaders have a profound impact on organisational health and safety outcomes. They
create vision (Kotter1996), strategies (Swanepoel and Slabbert, 2003), manage and
lead change (Scholes, 2002) and transform organisations (Yukl, 1994). Thus, the
transformation of the organisation to world-class commences with leadership
(Prinsloo et al 1999).

The literature review revealed that leadership and safety has been extensively
researched (Flin and Yule, 2004 and Clarke and Ward, 2006). However, it also
indicated that differences in leaders with regards to occupational safety have not
been pertinently researched although O'Dea and Flin (2003) identified that different
leader attributes at different levels in the organisation contributed to occupational
safety.

Since transforming the organisation to world-class commence with the leaders, the
application of the safe human measuring instrument (that measures the safe human
mindset) to Managers, Shiftbosses and Miners (three production leader levels) is
aimed at eliciting differences in the safe mindset of leaders. These differences in the
safe mindset of leaders need to be addressed to transform the organisation to world-
class status.

1.4 The Safe Human Mindset
The dimensions of the Safe Human Mindset Model (Schutte, 1998) (associated with a safe mindset or safety motivational intent) will be measured with the application of the Safe Mindset Survey. The dimensions are briefly introduced below and discussed in detail in Chapter 2 in the theoretical foundation of the model.

1.4.1 Relationship credibility
The key success factors that are functional to the relationship credibility are trust, support, ownership and respect all of which are leadership traits. Leaders need to create, live and ensure compliance. Commitment follows compliance (Schutte, 1998).

1.4.2 Climate (work life experience)
Organisational commitment refers to the degree an employee identifies with the organisation and its goals and the wish to retain membership. The ability of an employee to see the connection between his work and the strategic objectives of the organisation is a driver of positive behaviour according to Rucci, Kirn and Quinn (1998). Thus, work environment plays a significant role in promoting strategic objectives in an organisation.

The work environment is put firmly under the control of management inside and outside the workplace according to Stranks (1997). Pybus (1996) supports this view and argues the work environment is associated with management and strategy practice. Inside the workplace the employer must ensure recognition, measurement evaluation and hazard control and outside ensure that people in the vicinity of the workplace are not exposed to pollution, thus creating a culture of safety within and without the organisation.

1.4.3 Safety culture
Safety culture refers to the way things are done in an organisational context. According to Schutte (2004) cultural perceptions are intangibles that bring people to share or deny a common vision for an organisation and its goals. The organisational characteristics indicative of workforce behaviour, rationale behind behaviour, unquestioned rules and unstated or unconscious beliefs are all associated with the culture prevailing in an organisation.
The outcome is safety intent, which Schutte (1998) describes as the perception regarding the commitment of management to lead by example and to utilise elements such as safety meetings, recognition, safety environment and safety outlets to enhance safe behaviour. It is in the absence of shared values and beliefs (specifically where safety is concerned) that it becomes a primary function of leadership to instil and monitor the safe mindset of the workforce to forestall a fatalistic approach and mindset (Schutte, 1998). These have profound implications for the mining industry and shop floor relations.

1.4.4 Values and beliefs

Values are standards, goals, philosophies and prevailing social principles. According to Schutte (2004) values are expressed in behaviour (employee offers behaviour) and values are indicative of what workforce behaviours are designed to accomplish.

From a safety point of view it represents a brothers’ keeper mentality, opportunity to prevent risk, positive supervision and team commitment with regards to safety. Beliefs provide the context and reality in which behaviours occur and refer to the unquestioned rules, unstated and unconscious beliefs and assumptions that are taken for granted. It finds expression in the culture - the way things are done (Schutte, 2004).

Since new generation employees entering the workplace accredit a high premium on loyalty to relationships, the values of supervisors as is displayed in behaviour, influence the climate within an organisation (Robbins, 1996).

1.5 Background to the Research Problem

The safety statistics for Platinum Mines in South Africa indicate an increase from 24 fatal injuries per annum in 1994 to a peak of 65 in 2004 and down to 40 in 2006. Injuries and incidents have remained constant at approximately 700 per annum during the same period. The human factor is prevalent in these incidents. Heyneke (2003) reports that 87% of fatalities on a mine investigated were as a result of human error.
Investigations of fatalities in the underground operations stated above, occurred after the Mine Health and Safety Act 29 of 1996 introduced the blasting certificate holder (miner) to previously disadvantaged people by eliminating the scheduled person (contract miner). Various mining houses grasped the opportunity and trained their own miners.

The miner has no specific assigned legal responsibilities with regards to the Act but must adhere to Codes of Practice developed by each mine and approved by the Department of Minerals and Energy. The shift supervisor to whom the miner reports has specific legal responsibilities with regards to the Act. A possible conflict of interest thus arises which is defined as an economic (production) Miner vs. safety (Shiftboss). It is not intended to research this issue in the study but it may lead to further research on the subject of leadership and joint governance.

In the mining industry safety, quality, productivity and costs are business goals which are both interdependent and integrative of each other. According to Schutte (2004) the mindset or motivational intent of a workforce is fundamentally shaped by the relationship credibility, which leads to a specific climate (work life experience) resulting in a specific culture (behaviour in company context). The proposed study is aimed at examining this in the context of Managers, Shiftbosses and Miners (production leaders) on a platinum mine.

The platinum mine included in the study has commenced with three specific safety interventions:

- Development of the leadership in the organisational hierarchy.
- Introduction of behaviour based safety as an intervention to address and eliminate at – risk behaviour. This is a bottom up as well as a top down process and uses the principles of behaviourism and group dynamics to achieve sustainable safe behaviour on all organisational levels.
- Introduction of mission directed work teams to:
  - Establish business focus, goal alignment and visual management of quality, speed and cost performance on the workface.
  - Improve functioning of natural teams in the organisation hierarchy.
Credible leadership must ensure sound relations on the shop floor (at the workplace) by creating a specific climate and a compelling work atmosphere that results in a specific value-based culture and common beliefs, which are lived by all, so creates the desired safe behaviour. Schutte (2004) postulates that the lack of credible leadership that must ensure a compelling place to work and who have not instilled common values and beliefs result in a poor mindset or low motivation resulting in a fatalistic approach.

Heyneke (2003) states that leadership plays an important role in the behaviour of employees in the work situation and contributes to the minimising of work related incidents and injuries. A number of visible behaviours could be identified which negatively impacts on safety. Safe and productive leaders in the underground working environment act in relation to personal, inter-personal and professional leadership principles.

The safety record and statistics in the platinum mining industry indicate that the elements required to be reported as world-class with regards to safety have not been developed to the required level of sophistication. The proposed study is set to examine this concern in an attempt to explain the relatively high fatality rate.

1.6 Problem statement
The fatalities experienced in the platinum industry can be ascribed to the relatively low safety motivational intent (mindset) of the production leaders. Since the various leader levels are directly involved with the workers on a daily basis, the assumption can be made that they impact negatively on the mindset of the workers, resulting in injuries and fatalities. The low safety motivational intent originates from within the leader levels in the target organisation.

1.7 Research Questions
The questions that motivated this study and led to the problem statement are as follows:
- Does the safe mindset of the three leader levels differ?
• To what extent does the safe mindset of the three leader levels differ with regards to each other?
• What are the dimensions that impact on the safe mindset of the three leader levels that need to be addressed at each level?

1.8 Empirical Study Objectives
The number of fatalities is unacceptable and the results obtained through the study will be utilised to address this phenomenon. Considering the research questions stated above, primary and secondary objectives are identified next.

1.8.1 Primary objectives
• The primary literature review objective is to create a frame of reference of both the World-Class organisation and the Safe Human Mindset Model; the empirical research is based on the latter.
• The primary empirical research objective is to establish the safety motivational mindset (intent) of Managers, Shiftbosses and Miners (production leaders) in a platinum mine in South Africa. The Safe Human Mindset survey (measuring instrument) is aimed at identifying the key success factors that enhance proactive health and safety management. Improved safe and productive behaviour is achieved through identifying, measuring and addressing the key success factors.

1.8.2 Secondary objectives
• Identify and prioritise strategic and operational job and safety related solutions of a sustainable nature that will enhance an incident-free, competitive and profitable organisation.
• Through the application of the Safe Human Mindset survey (measuring instrument) the motivational intent of Managers, Shiftbosses and Miners will be established and interventions recommended. The results will be evaluated to establish both similarities and dissimilarities together with recommended interventions.
• The possible differences in expectations between Managers, Shiftbosses and Miners need to be identified and appropriate interventions recommended to enhance a safe mindset.
• The recommended interventions will be implemented to develop production leaders to enhance safety and quality production.
• Best practice and benchmarks on the safe mindset of production leaders will be formulated since a probable state of emotional intelligence (state of relationship) can be established. The needs of the two groups in question can be established and a safety consciousness developed in order to promote a vested interest in sustainable safety.
• The development needs of specific groups can be addressed from the results obtained whilst from a recruitment and selection perspective improved criteria can be developed for both groups.
• The rationale behind a fatalistic and/or destructive behaviour and approach in both groups will be identified and common values and beliefs that explain behaviour need to be identified in both groups together with recommended interventions.
• The implementation of recommended interventions will improve employment relations on the various leadership levels and will contribute to the elimination of fatal injuries.
• The study could also stimulate further research from a team perspective since both groups have subordinates and function as teams whilst management could be researched from a cultural or policy execution point of view.

1.9 Hypothesis
The effect and influence that leaders have on followers have been amplified in various studies (Bass, 1990; Yukl, 1994 and Wong and Law, 2002). When leaders in an organisational safety context have a mindset conducive to safe production, their subordinates would also develop a mindset conducive to safe production resulting in safe behaviour. An integrative hypothesis for the empirical study is formulated from the empirical study objectives stated (in paragraph 1.8) above.
The integrative hypothesis H01 is formulated as follows:
There is no statistically significant difference between the safe mindset (safety motivational intent) of the Managers, Shiftbosses and Miners in the target organisation.

Rationale:
No empirical evidence exists in the literature that the safe mindset of the various production leader levels in an organisation differed significantly thereby impacting on organisational safe performance.

1.10 Research Design
The following is a brief outline of the study design process to be followed as well as statistical procedures applied in this study. Chapter 3 titled Empirical Research Methodology provides a more detailed discussion in this regard.

1.10.1 Research method
The method of research proposed is a quantitative approach (survey) by means of the application of the Safe Human Mindset Measuring Instrument (SHMI) to the Managers, Shiftbosses and Miners (three production leader levels).

The survey (measuring instrument) is a statistically validated, Likert type survey scale that measures the various constructs of the Safe Human Mindset Model.

Schutte (1998) developed the SHMI in his research in the South African Mining Industry. According to Schutte (1998) the motivational intent or workforce mindset is fundamentally shaped by the relationship credibility between a supervisor and subordinate, leading to a specific work life experience (climate) resulting in a culture of the way things are done and which is supported by a value and belief system.

The study is specifically aimed at safety. It is at the latter level (subordinate) where the fatalities in the Platinum Mines are experienced. It is intended to establish the mindset (motivational intent) at these levels since all are in leadership positions and provides direction which consequently is a prerequisite for the classification of the organisation as world class.
1.10.2 Sampling
The approach differs from the classical randomised cross sectional survey in that the total population for Managers (N1=18), Shiftbosses N2=28) and Miners (N3=60) (Total N=106) will be subjected to the survey.

The study is conducted on a platinum mine in the North-West Province which has been in existence for six years and is considered a young mine in mining terms.

1.10.3 Research Process
With the aim of realising the study objectives, the research process consists of the following steps:

Step 1
A comprehensive literature review will be conducted on both the world-class organisation and the Safe Human Mindset Model. The aim is to build a common frame of reference regarding what constitutes world-class and the Safe Human Mindset.

Step 2
The administering of the Safe Human Mindset Survey (the measuring instrument) to the Managers, Shiftbosses and Miners (three production leader levels) on a platinum mine (the target organisation). The application of the measuring instrument (SHMI) generates a set of data.

Step 3
The data will be statistically analysed by the statistical Consultation Service (STATCON) at the University of Johannesburg (UJ) using the SPSS for Windows programme. The original data set of the Safe Human Mindset Model (trade mark) will be administered by the Department of Statistics at the University of North-West (Potchefstroom Campus) using the SAS statistical analysis programme.

The aim is to statistically (empirically) determine the various psychometric results of the application of the SHMI on the three production leader levels in the study.

Step 4
The results will be analyzed and interpreted and recommendations made to address areas for development within the target organisation as well as possible future research opportunities emanating from the study.

1.10.4 Method of data collection and processing
Responses include nominal data (responses to the demographic questions), as well as ordinal data on a four-point Likert type scale.

Statistical analyses
The Statcon Department at the University of Johannesburg will conduct the Statistical analysis using the SPSS statistical package and the Department of Statistics at the University of North-West (Potchefstroom Campus) will also conduct statistic analysis on the applied measuring instrument and data collected using the SAS Institute Inc. 2007 SAS System for Windows release 9.1 TS level 1 M3.

- The processing of the data will be done by means of validated statistical procedures. In processing the data the main emphasis will be on descriptive statistics, which is defined by Berenson and Levine (1996) as those methods involving the collection, presentation, and characterisation of a set of data in order to describe properly the various features of that set of data. A univariate process of analysis will be followed (De Vos, Strydom, Fouche, Poggenpoel, Schurink and Schurink, 2000).
- Descriptive statistics are thus used to organise and summarize the masses of numerical data that are collected according to Lind & Mason (1994).
- In order to evaluate the respective statements and questions, the data is presented as a frequency distribution to facilitate certain calculations, namely the means, standard deviation and levels of confidence, as well as to make the process of data analysis and interpretation more manageable and meaningful as described by Berenson et al (1996). According to Lind and Mason (1994) a frequency distribution is a grouping of data into categories showing the number of observations in each mutually exclusive category, and is thus an indication of how many respondents assigned a specific value to a question or statement. Histograms are used to portray the frequency distributions graphically.
• The arithmetic mean, which is the most commonly used average of measure of central tendency according to Berenson et al (1996), is calculated for each question or statement.

• According to De Vos et al (2000) the mean specifies the centre of gravity or balance point of the distribution.

To determine the representativeness and reliability of the mean, the standard deviation as a measure of dispersion is calculated for each question.

• **Cronbach-Alpha**

To determine the within-group variation and thus the reliability of the data and statistical significance, Huysamen (1994) proposes that the Cronbach-Alpha test be applied. Cronbach’s coefficient alpha is a measure of the internal consistency of the questionnaire. The standard mean, median and standard deviations will be established.

To determine whether empirical evidence of significant statistical differences exist between the three leader levels, analysis of variances (ANOVA) will be conducted depending on the normal distribution of data. In addition inferential statistics (parametric and non-parametric tests) together with Multiple Comparisons Post Hoc Tests will be applied with the aim of testing hypothesis (Struwig and Stead, 2004).

The results in the first instance are interpreted for purposes of testing hypothesis. Secondly, the results are interpreted for recommendations to address possible areas for development and lastly for recommendations regarding possible future research opportunities.

### 1.11 Limitations of the study

The limitations of this study lies within its specific focus on production levels in a mining environment and are identified as follows:

- The study is aimed at Managers, Shiftbosses and Miners and not employees.
The quantitative design of the study allows for voluntary completion of the measuring instrument (questionnaire) by the three production leader levels namely Managers, Shiftbosses and Miners depending on their goodwill.

As a result of the numbers of the three leader levels, the total populations for the three leader levels were included in the study.

The mine is a relatively young mine in mining terms and is progressing to establish a climate and culture of safe work performance.

The study is applied in an environment conducive to production which make generalizations to service industries such as financial institutions and retail markets impossible.

**Proposed value of the study**

The proposed values of the study lie in the specific focus areas and are:

- The safe mindset (safety motivational intent) of the three production leader levels is established with identified areas for development.
- Behaviours influencing a safe mindset are determined which facilitate leader development processes and interventions on both the intra and interpersonal levels.
- Although the study is aimed at a specific target organisation and not the group of organisations to which the target organisation belongs, the areas identified for development can be applied within the supervisory skills and leader development processes group wide.
- The results of the study facilitate processes to achieve zero fatalities and injuries.
- Although the SHMI has been applied in the mining industry, this study is the first to be submitted for academic purposes.

1.12 Chapter layout

The proposed study will be conducted within a specific framework and consists of six chapters:

1. **Chapter 1**
   Background and introduction to the study

2. **Chapter 2**
Theoretical discussion of both the World-Class model and the Safe Human Mindset Model

3. Chapter 3
   Research Design and Methodology

4. Chapter 4
   Empirical Results of the study

5. Chapter 5
   Discussion and interpretation

6. Chapter 6
   Conclusion and recommendations

1.13 Conclusion
The mining industry and specifically the platinum industry is in a process of change presently where policies (influenced by legislation), structure and job design is constantly addressed.

This intended study provides a diagnostic departure point in ascendance to world-class status specifically where safety is concerned. By identifying the various aspects of concern that impact on the safe human mindset of the workforce, the capacity of leaders can be built to transform the organisations to zero fatalities, which is a strategic imperative.

By becoming world class through applying inter alia the required leadership skills and creating the desired organisational culture and climate supported by an agreed value and belief system, a psycho-social contract can be formed to ensure the commitment of every individual to safe working practices. The study seeks to elicit these features.
CHAPTER 2

Theoretical discussion of the World-Class Model and the Safe Human Mindset Model

Every problem has in it the seeds of its own solution. If you don’t have any problems you don’t have any seeds.

- Norman Vincent Peale
CHAPTER 2: LITERATURE REVIEW

2.1 Introduction
The previous chapter contextualised the intended study. The purpose of Chapter 2 is firstly to provide a literature review of the world-class organisation and secondly to discuss the theoretical foundation of the Safe Human Mindset Model on which the measuring instrument intended to be applied in this study, is founded.

2.2 The World-Class Organisation
South Africa has been reintegrated into the global economy for the past thirteen years. Its economic global competitiveness has not improved since 1994 and is seriously lagging behind. Prinsloo, Moropodi, Slabbert and Parker (1999) reported that South Africa ranked number forty-five out of forty-six developing countries where productivity was concerned.

This ranking has subsequently not improved. Several sectors of the economy have been adversely affected due to global competitiveness. The agricultural sector for instance is affected by subsidization in various countries globally, which inhibits investment, global competitiveness as well as benchmarking performance. The mining industry has experienced the closure of several mines, mergers of mining houses and de-listings on the Johannesburg Securities Exchange. The debate about the calculation of employment levels and continuous reduction in labour in various sectors for example the textile industry, strengthens the concern that employment levels are declining. The trade union marches in August and September of 2005 and disruptive stay away in May 2006 and 2007 organised by COSATU countrywide, indicates a growing concern and dissatisfaction in the ability to grow the economy, provide services and create employment. On the other hand competition is increasing globally and the take-over of ABSA bank by Barclays of the United Kingdom as well as the opening of more internationally accredited business schools in South Africa are recent examples. The need to change or adapt to survive and excel in this competitive global economy is therefore imperative.
The South African history of paternalism and authoritarian rule also created adversarial relations leading to mistrust and disrespect between management and worker, thus inhibiting the development of a culture of excellence and performance.

The South African mining industry is constantly under pressure due to lower or stable product prices, expensive mechanisation that is associated with deeper mining, as well as increasing labour costs. The predicament that rising costs cannot be passed on to the consumer due to sensitive world market prices adds to the dilemma. The mines in South Africa are also the deepest in the world and are prone to more seismic activity. This challenges mining engineers to continuously improve safe working practices and mine cost efficiency whilst improving productivity. In addition the fatality index for platinum mines in South Africa has not improved since 1994 despite continuous efforts. All of these factors affect the industry’s striving towards world-class status.

Prinsloo et al (1999) propose the World – Class Model (referred to in Figure 1-1) as a benchmark for organisations to strive towards. The various components of the model will be addressed in this chapter from a theoretical perspective and where applicable, as well as from an organisational safety dimension. According to Prinsloo et al (1999), world-class means becoming competitive with other business organisations by means of benchmarking performance. The transformation to world-class must be achieved through total stakeholder participation in mobilizing support, allocation of responsibilities, delegation and acceptance. Thorne and Smith (2000) argue that any organisation working to become world-class in future needs action, visionary and purposeful leadership allied to trustworthy, value-adding employees. To this end, Thorne et al (2000) identify certain key factors to define and analyse core competencies as required by the organisation of the future:

- Organisational leaders will replace the traditional approaches to organisational controls with a model based on competence, loyalty and trustworthiness. Ways to encourage creativity and to nurture every employee’s unique knowledge and capabilities will have to be found.
• Technology will drastically change the way work is performed, communication takes place and people socialize. Technological innovation will also improve work processes and accommodate horizontal workflows by providing cross-functional information flow and performance feedback.

Hence, the way work is organized and performance is managed will be affected. This has profound implications for the organisational structures in organisations and the conventional structure will make way for team based work on a cross-functional level (Thorne et al, 2000).

Team based structure
According to Thorne et al (2000), individuals with specific knowledge and expertise will combine to make decisions and provide direction. Leadership will also be transformed from individual to a team based structure.

• People come first
World-Class companies treat their people as their most important asset and the most successful enterprises will be the ones with the fastest reactions, innovative management and the best people. There will be four basic management styles applied depending on situational requirements namely delegating, supporting, coaching and directing.

• New social responsibility
Organisations will increasingly take responsibility for the establishment of infrastructure and community welfare. Evidence of this can be noted in remote rural areas where the mining industry has provided roads, power and water supply as well as social investment projects aimed at long-term sustainability.

• Partnership with customers
Customers will be incorporated into the business as partners and as an extension of the organisational culture identifying with the value and belief system of the organisation.

• Leadership in world-class organisations
The organisation will need a strong purpose and vision and be focused on its core values in order to make the work meaningful in a bid to attract, motivate and retain outstanding people. This implies fierce competition for intellectual
capacity. It is up to leadership to create and instil a shared vision and a common purpose in order to ensure motivation by employees to perform the organisations' work.

- **Transient management**
  Leaders will need experience and understanding of multi cultural values and beliefs to function effectively in increasingly international markets.

- **Psychological strength**
  As a result of increasing pressures, leaders will need perseverance and persistence. They will need to be innovative and creative and operate from clear moral and ethical values.

- **Stable social order**
  World-class organisations of the future will gain competitive advantage from providing a stable social order. The most enlightened organisations will actively promote the world wide mutual benefit of providing efficient and effective social goods and infrastructure that supports the operation of global markets for consumer goods.

Prinsloo et al (1999) postulate that whilst organisations will continue to focus on the management aspects, the transformation to world-class will be facilitated through leadership. The discussion that follows addresses the world-class organisation from a theoretical perspective in terms of the model proposed by Prinsloo et al (1999).

Leadership and customer centred strategy are the directive forces whilst organisational fabric and joint governance form the delivery system. Organisational culture together with the key performance drivers of cost, quality and speed of delivery, satisfied employees and customers as well as community members, profits and competitiveness components represent positive business results.

### 2.2.1 Direction

#### 2.2.1.1. Leadership

#### 2.2.1.1.1. Introduction
The ascendance to world-class status requires leaders at the various levels in the organisation to provide the necessary input and direction to transform the organisation. It has been reasoned in chapter 1 that leadership is about:
- deriving and implementing strategy
- directing organisational transformation
- affecting change
- creating the desired organisational climate and culture and
- care and growth of people

The discussion that follows on leadership and the various organisational aspects related to and influenced by leadership is aimed at the study at hand and is not inclusive of all relevant theory in this regard. Leadership impacts on various organisational processes and acts as a catalyst to bring about desired results in the organisational context. A review of the literature elicit the following aspects of leadership:

- **Leadership and organisational strategy**
  It is the primary function of leadership to ensure an organisational strategy and to mobilise the workforce in achieving what it wants to achieve (Yukl, 1994).

- **Leadership and organisational change**
  To firstly transform the organisation to world-class status as well as to change the safety strategy in order to eliminate fatalities will require a change strategy as well as measuring format to ascertain progress (Kotter, 1996).

- **Leadership and organisational culture and climate**
  Leadership needs to install a climate conducive to performance and a culture of safe working practices (Yukl, 1994).

- **Leadership care and growth** are styles of management that benefit both the individual and the organisation (Schuitema, 2004).

- **Transactional and transformational leadership**
  To affect the intended changes the organisation needs to be transformed. Transactional leadership or management however need to be maintained since both are necessary during change (Robbins, 1996).

- **New developments in studying leadership**
  Although the correlation between safety in the workplace and leadership style has not yet been established, new insights into the study of leadership focus on
the leader and leadership as an inward-outward process arguing that once a leader is in touch with the inner-self, the outward process of leading people can commence (Smith, 2002).

Leadership according to Wickens (1999) is about creating the strategy, values, the sense of purpose and the goals of the enterprise, then living them so that all members are inspired by them and come to share these goals. Leaders also need to create the environment in which leadership can be displayed at all levels, where all people are valued and can perform to their full potential, establish their own goals, successfully implement them and be innovative. Leadership must also ensure that gains are sustained and that the enterprise is continuously improving by managing work that other people do, thereby integrating leadership and management (Zaleznik, 2004). To be successful leaders in business, Kotter (1996) asserts that one must have a strong competitive drive and an interest in lifelong learning. The latter is strongly associated with risk taking, reflection on success and failures, promotion of listening skills, soliciting ideas from others and feedback.

It is evident that leadership involves a social process of influence by one individual over other individuals to structure activities and relationships in a group or organisation. This then presupposes an understanding of group behaviour (Yukl, 1994). According to Yukl (1994), studies by Hemphill and Coons introduced the multi-directional concept of communication in exercising leadership. Their definition of leadership focused on the behaviour of an individual when the activities of a group towards a shared goal, is directed. In large organisations the effectiveness of middle and lower level managers depend on their influence over superiors, peers and subordinates. The three-sixty degree performance evaluation process supports this philosophy. This was a fundamental shift in the study of leadership, which concerned itself with studying traits of leaders since the 1920’s as a result of the developments of psychological tests. Traits were described as the variety of individual attributes, including aspects of personality such as temperament, needs, motives and values.

Yukl (1994) argues that the results of trait research were inconclusive pertaining to leadership success since a leader with a specific trait could be successful in one situation but ineffective in another situation. Robbins, Odendaal and Roodt (2003)
state that trait theory described the characteristics of leaders for example Margaret Thatcher of Great Britain, our own Nelson Mandela and Adolf Hitler (however destructive) as charismatic, courageous and enthusiastic. Trait theory had limitations and Robbins et al (2003) offer four reasons for this 1) Traits appeared to predict leadership in selective situations 2) Traits predicted leadership more in weak than strong situations where strong referred to strong behavioural norms being prevalent, strong incentives for specific behaviours and clear expectations as to which behaviours were rewarded or punished were applied 3) An unclear distinction between cause and effect for example were leaders self-confident or did success as a leader build self-confidence 4) Traits exceeded in predicting the appearance of leadership than actually distinguishing between effective and ineffective leaders. This inability to identify traits led researchers to look at behaviours displayed by specific leaders.

The behaviour theories as reported by Robbins (1996), were formulated by researchers at the Ohio State University and the Michigan University in the mid 1960's. Effective leadership was described in terms of two dimensions by the Ohio State University namely, initiating structure and consideration. Initiating structure referred to the extent that the leader defined and structured their own and employees' roles to achieving goals. Consideration described the extent to which the leader would have work relationships, which were characterised by mutual trust and respect for feelings and ideas of employees. The Michigan University studies also identified two dimensions of leader behaviour namely employee oriented and production oriented behaviour. Employee oriented leaders emphasised interpersonal relationships, took personal interest in needs of employees and accepted individual differences. In contrast production oriented leaders emphasised the task aspects of the job. The managerial grid developed by Blake and Mouton is based on this theory and reflects a graphic portrayal of the two dimensions of concern for people and concern for production.

Scandinavian researchers reviewed the data from the above - mentioned studies and argued that in a changing world effective leaders would exercise developmental behaviour (Robbins, 1996). The results appear that leaders who demonstrated
development-oriented behaviour have more satisfied employees and are seen to be more competent.

Contingency theory in leadership developed as a result of the difficulty in predicting leadership success as well as a failure by researchers to obtain consistent results, directed attention to situational influences. Several approaches for example the Fiedler contingency model, which proposes that effective group performance depends on the proper match between the style of the leader and the degree to which the situation gives control to the leader, was developed (Robbins, 1996).

Yukl (1994) reports that the definition of leadership by Tannenbaum and Schmidt (1961) introduced a situational variable in leadership and defined leadership as an interpersonal influence exercised in a situation through a process of communication towards goal attainment. He accords Tannenbaum and Schmidt (1958) with having found that decision-making forces reflected forces in the leader, forces in the subordinates and forces in the situation. The conclusion that the leader is not only involved in the relationship with subordinates but also the traits, characteristics and goals of followers was drawn by Stogdill in 1948 as reported by Yukl (1994). This also varied from situation to situation introducing situational leadership, which was formulated much later in 1984 by Hersey and Blanchard.

Situational leadership theory developed by Hersey and Blanchard, Path-goal theory introduced by House and leader-member exchange theory, are examples of contingency theory according to Robbins et al (2003). Neo-charismatic theories on leadership have three underlying common themes according to Robbins et al (2003) namely: 1) Symbolic and emotionally appealing leader behaviours are emphasised 2) An attempt is made to explain how certain leaders are able to achieve extraordinary levels of follower commitment and 3) a man in the street approach is followed without emphasising theory. The most common approaches in developing leadership theory are based on behavioural approaches and include charismatic leadership and differences between transactional and transformational leaders. Since the conclusion can be drawn that effective leaders adapt to varying situations and are not fixed on a single style, additional issues are raised pertaining to leadership. Emotional intelligence, team leadership, moral and ethical leadership as
well as cross-cultural leadership in an increasing global and multi-cultural environment are contemporary leadership study topics.

The argument is now raised is that if the emphasis is on leadership, then the place of management in the organisation needs to be addressed. Yukl (1994) argues that effective management is influenced by power and influencing relationships, which can both be gained or lost. Leadership is associated with and exercised through participation and delegation, strategy (as a function of top executives), power and influence, decision-making groups, transformation and managing both relationships and work. This introduces the concept of leadership and management although Kotter (1996) argues that both are necessary and complementary to each other despite the difference.

Kotter (2001) argues that leadership is not a replacement for management and reasons that both leadership and management is necessary for business success.

Management is more about directing and controlling in an organisational context. One can argue that management is about the transactional process and leadership is associated with transformation. Robbins et al (2003) argue that both management and leadership are necessary in the organisation. The differences between management and leadership proposed by Yukl (1996) and Kotter (2001) can be summarized as follows:

<table>
<thead>
<tr>
<th>Management</th>
<th>Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Coping with complexity</td>
<td>• Coping with change</td>
</tr>
<tr>
<td>• Complexity is managed by planning and budgeting</td>
<td>• Change commences with setting a direction</td>
</tr>
<tr>
<td>• Capacity to achieve plan through organizing and staffing, create organisational structure and jobs for accomplishment of plan through competent individuals</td>
<td>• Aligning people</td>
</tr>
<tr>
<td>• Plan achievement assured through controlling and problem</td>
<td>• Achieving vision requires motivating and inspiring people in</td>
</tr>
</tbody>
</table>
Management is about planning, organizing, leading, controlling and directing the activities in the organisation towards the achievement of goals. Thus management deals with complexity. Leadership is about inspiring and motivating people towards a vision, aligning people through communication and affecting change through providing direction, motivation and establishing values.

Kotter (1996) explains the relationship between vision, strategies, plans and budgets through leadership and management activities as such: Leadership creates vision (a sensible appealing picture of the future) and strategies (logic of how the vision can be achieved). Management creates plans with steps and timetables to implement strategies as well as budgets with plans converted into financial projections and goals.

Zaleznik (2004) however reasons that the conceptions held between order and chaos distinguishes managers from leaders. The difference between management and leadership is explained through five concepts:

<table>
<thead>
<tr>
<th>Manager</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager versus Leader Personality</td>
<td>Rationality and control</td>
</tr>
<tr>
<td></td>
<td>Entrepreneurial culture</td>
</tr>
<tr>
<td>Attitudes towards goals</td>
<td>Impersonal</td>
</tr>
<tr>
<td></td>
<td>Personal and active</td>
</tr>
<tr>
<td>Conceptions of work</td>
<td>Problem solving and balancing opposing views</td>
</tr>
<tr>
<td></td>
<td>Develop fresh approaches and open issues to new options</td>
</tr>
<tr>
<td></td>
<td>Limit risk</td>
</tr>
<tr>
<td></td>
<td>Risk tolerant</td>
</tr>
<tr>
<td>Relations with others</td>
<td>Seek compromises and balance of power</td>
</tr>
<tr>
<td></td>
<td>Intuitive and empathetic</td>
</tr>
</tbody>
</table>
• Senses of self
  Harmony with duties and responsibility
  Feel separate from their environment
  Form wide attachments
  Create and end intensive one-on-one relationships

Considering the attitude towards goals, Zaleznik (2004) argues that the leader influences moods, creates expectations and specific objectives thereby directing the business in a determined way. This introduces the concept of emotional intelligence, which will be addressed in the section on new developments in studying leadership.

It stands to reason then that both management and leadership are required skills for managers in organisations especially in the South African context where organisations are dealing with complexities like global markets as well as changing and transforming organisations inter alia due to legislation e.g. Employment Equity. Consequently organisations need both strong management and leadership for optimum effectiveness.

2.2.1.1.2 Leadership and organisational strategy
In this discussion of leadership and organisational strategy, the role of leadership in establishing strategy as well as the concepts and process of establishing strategy will be addressed. The strategy with specific relevance to safety in the organisation being studied will also be discussed.

In an open systems approach, organisations do not function in isolation but exist as a system in the wider environment in which it exists as a subsystem (Slabbert et al, 2003).

In a modern approach, companies may also be seen as resources belonging to and serving society. This approach is evident in the South African context where organisations actively take part in the development of the larger society with
corporate social investment and sustainable development initiatives. This also assists in providing functional legitimacy.

According to Slabbert et al (2003), strategy has its origins in the military more than two thousand five hundred years ago in ancient China. In more modern day management terms strategy refers to an integrated, overall plan for achievement of the goals of an organisation (Slabbert et al, 2003) and centres around the survival and success of the enterprise. Since organisations operate in an external environment and often globally, events that occur externally are of equal and in some instance more importance, than events within the organisation for instance where organisations compete in volatile global markets. These issues or events are anticipated and addressed in the strategic planning process.

It will be argued further in this chapter that leadership establishes the purpose, vision and mission of the enterprise. The strategic planning process commences with this statement of existence.

_When nothing is sure anything is possible_

- Margaret Drabble

Slabbert et al (2003), postulate that leadership is mobilising people through processes of influencing and active engagement towards the attainment of goals. The actual effectiveness of the leader in terms of his influence on the future performance of the organisation also depends on how the attributes of the leader are perceived by the followers. Yukl (1994) states that the capacity of executives to affect and implement major strategic changes depend in part on the perception of followers and stakeholders that these changes are in fact necessary and beneficial.

Yukl (1994) argues that top - level executives mediate between forces of stability and forces for change. Forces of stability increase during periods of convergence when small and incremental changes are made to solidify and reinforce the new strategy and increase consistency between strategy, organisational structure, culture and people. This also allows for delegation of responsibility to middle and lower level managers.
The potential of executives to influence organisational performance is much larger when changes in the environment threaten to undermine the effectiveness of an existing strategy or provide unusual opportunities to pursue a new strategy. An executive who anticipates the need for change and takes bold steps to deal with threats and capitalise on opportunities can have a dramatic effect on the long-term effectiveness of the organisation.

Yukl (1994) associates leadership with strategy, participation and delegation, decision-making groups and transformation. Leadership is also exercised through power and influence, managing relationships and work. Strategy is a function of top executives and Yukl (1994) argues that there are many reasons why top executives only affect incremental changes, rather than initiate major strategy reorientation. Executives are strongly influenced by implicit beliefs, assumptions and values underpinning the prevailing culture and strategy. Attention to make the prevailing strategy work, cutting of costs and tightening of controls only result in temporary improvements in performance resulting in the executive appearing to be successful. When crisis looms for instance through declining performance or new competition, the strategy is first to amend the existing strategy rather than evaluate the effectiveness and rationale. In the absence of crisis the need for change is questioned and even resisted. Yukl (1994) reasons that in the absence of crisis to affect successful change, unusual talent, energy and power is required.

Change does not only affect the reporting structures and the concurrent adaptations in the power relationships (some people gain and others relinquish power at the expense of each other, resulting in resistance to change), but also allocation of resources, interaction activities, communication, operational procedures, norms and values about how things are done (culture), staffing of key positions and the assignments of roles. For change to be successful, strategy, structure, processes and people need to be reoriented to avoid resistance, making it imperative for the executive to direct the desired change and provide the vision, energy and guidance to succeed. According to Yukl (1994) studies conducted by Tushman and Romanelli (1985) revealed that top executives constantly mediate between forces of stability and forces for change. The way executives perceive and react to these forces and deal with them has major implications for organisational performance. In certain
instances and circumstances it may be necessary to move the organisation away from an existing state towards a new state, through a process of strategic change especially where new products or markets require a new course of action. This will be discussed appropriately in the section dealing with leadership and change.

The survival and prosperity of the organisation depends on the adaptation to the external environment by devising a strategy for product marketing, obtaining resources and dealing with external threats (Yukl, 1994). The purpose of planning is to ensure the efficient organisation of the work unit, co-ordination of activities, effective utilization of resources and adapting to a changing environment. Yukl (1994) expresses the need for the executive team to provide commitment to the effective implementation of the strategy, which hinges on some form of consensus. An integrative approach, where strengths and weaknesses of all options were considered and detailed actions and budgets implemented together with the preferred alternative, contributed to effectiveness.

A clear, appealing vision and strategy for attaining this is essential. The strategic vision helps to identify the purpose and priorities of the organisation whereas the strategy focuses on the core mission of the organisation. A precondition for success is that the strategic vision must reflect the values and aspirations of other organisational members.

Competencies that are becoming increasingly important are cognitive complexity, self-learning and cultural sensitivity.

Swanepoel et al (2003) refer to strategic management as involving two concepts namely management, which involves planning, organising, leading and controlling; and strategic management as the overall or total plan to achieve organisational goals. The process of strategic management is made up of several components that entail strategy formulation, implementation and evaluation. Since the time – focus of strategic management is long-term, planning focus around the vision, mission, strategies and long-term goals of the organisation. Swanepoel (2003) distinguishes between two strategy options namely generic strategy which concentrates on the how to do business and grand - strategy which is closely related to corporate
strategy which determines the broad approach to taking the organisation into the future. The grand strategy will guide the long-term decisions in the organisation.

As a result of globalisation, increased competitive pressures, greater technological complexities, increased diversity of the workforce, growing environmental concerns and changing socio-cultural values, Yukl (1994) advocates that executives will need at least four new competencies to remain effective:

- The ability to develop cognitive complexity and to analyse and change one’s own mental models and cognitive processes, increased flexibility to challenge own assumptions will demand self-learning.

Destiny is not a matter of chance, it is a matter of choice;
It is not a thing to wait for, it is a thing to be achieved
-William Jennings Bryan

- Cultural sensitivity is becoming more important since the workforce is increasingly diverse and thus requires an understanding of the values, beliefs and attitudes of the workforce. This is particularly evident in the South African context.
- The changing structure of organisations to more flat structures with the emphasis on teamwork, the improving technology of accessing information, task teams and project teams give rise to more competencies required in leadership of teams, empowerment and integrative problem solving.
- Due to the changing organisational structure becoming flatter and the outsourcing of non core business, process managers need to be more entrepreneurial with associated skills, negotiation of agreements with culturally diverse parties, build common commitment to joint ventures and co-ordinate interdependent activities which are spread geographically.

It has been argued that an organisation functions within a larger system. The interrelation between the internal environment (organisation) and the external environment (for example markets, community and legislation) form the basis of strategic planning. Porter (1996) defines strategy as ‘the creation of a unique and
valuable position involving a different set of activities’. Swanepoel et al (2003) quote Johnson and Scholes’ definition (2002) of strategy as ‘the direction and scope of an organisation over the long term, which achieves advantage for the organisation through its configuration of resources within a changing environment and to fulfil stakeholder expectations’.

Swanepoel et al (2003) describe the establishment of a strategy as a process. Firstly it commences with strategic thinking which is present throughout the strategic management process as to where the organisation is going. This involves as many organisational members as possible. The second step is to analyse the information gathered to establish and understand the strategic position of the organisation derived through a process of analysing the external environment and the internal situation of the organisation. It is only when the internal and external environments have been assessed, the impacting variables identified, forces and issues that have a potential impact on the long term success and competitiveness of the organisation have been identified as well as their potential influence on the strategic positioning and direction of the organisation established, that certain strategic choices can be made. Thirdly strategic choices are based on the evaluation of alternatives that have been generated in two above. These alternatives according to Porter (1985) may require trade-offs that can be acquired to establish sustainable strategic positioning. The fourth step is to derive detail steps and actions to pursue the set strategy.

Yukl (1994) describes action planning as an important step in implementing strategy and assists in determining time frames to execute projects, avoid delays, identify potential problems in implementing strategy, costs, allocating responsibilities and facilitates co-ordination between people and departments. Yukl (1994) provides the following guidelines for action planning:

- Identify action steps for each strategy
- Identify the optimal sequence of action steps
- Estimate the time needed to execute each action step
- Determine time frames of action steps (start and end time)
- Estimate costs for each action step
• Determine accountability for each action step
• Develop monitoring procedures for each action step
• Develop procedures for monitoring progress
• Consult with others to coordinate plans

The fifth step is to establish a control or measurement framework to ensure successful implementation. Kaplan and Norton (1992) propose the balanced scorecard approach, which motivates breakthrough performance, to reflect the measurement framework.

The balanced scorecard provides complex information about the organisations’ competitive agenda and forces executives to take cognisance of all information. Kaplan and Norton (1992) also postulate that the scorecard is most effective in organisations in transformation or dealing with change since it links performance measures. Kaplan et al (1992), state that the scorecard puts strategy, and not control at the centre. Financial measures are not the only measures indicating performance and the scorecard can be adapted to reflect these. It also assists in focusing attention and keeps organisations attention focused on the future. The elements, for which goals and measures are established, focus on financial issues, the internal and external business perspective as well as the innovation and learning issues.

*If we open up a quarrel between the past and the present,*
*We shall find that we have lost the future.*

* - Sir Winston Churchill

Since safety is a strategic imperative in the mining industry in South Africa, a safety strategy needs to be developed to eliminate incidents and injuries. Safe working practises are legislated in South Africa with the provision of systems and processes. The Department of Minerals and Energy is represented by inspectors who have prescribed duties, responsibilities and powers which, under certain circumstances may lead to suspension of mining activities and the closure of mines should legal requirements not be adhered to.
A safety strategy emanates from the overall risk management strategy of an organisation, which Esterhuysen (2004) argues originates in and supports good Corporate Governance. Corporate Governance is the system by which companies are directed and controlled. It structures the rights and obligations of all participants and stakeholders and entails the rules and procedures of decision making on corporate matters. The structure for setting objectives, means and measures for attaining these as well as monitoring performance are also provided.

The organisation represented in this study has a detailed implemented safety system based on the Occupational Health and Safety Assessment Series (OHSAS) 18001 internationally accredited system and has implemented systems and processes to ensure legal compliance to the Act. Representation and participation structures for example will be addressed in the section examining joint governance.

According to the OHSAS (1999), the objective of the OHSAS 18001 specification system is to establish requirements for an occupational health and safety management system to enable organisations to control the occupational health and safety risks and improve performance.

The OHSAS 18001 system prescribes policies, systems and procedures that need to be established to comply with certification standards.

Figure 2-1 explains the elements of the Occupational Health and Safety System (OHSAS 18001) and the organisations’ system in operation.
Safety, Health and Environment policy.
The organisation has a detailed implemented safety, health and environment policy with associated management principles ensuring management commitment, competence, risk assessments, prevention and control measures, performance management, and evaluation of the system, stakeholder involvement as well as continuous improvement to give effect to the policy.

- Occupational health and safety objectives will be documented and maintained for every relevant function and level in the organisation.
- A procedure to establish and maintain the identification and assessing of legal and series requirements is implemented.
- The top management of the organisation will, at pre-determined intervals, review the series’ implementation together with management systems with the aim to ensure the continuing suitability, adequacy and effectiveness. The review will establish the information required to conduct the evaluation, and be documented. The review shall address possible changes to policy, objectives and other elements of the series for continuous improvement.
- To give effect to the structure and responsibility requirements, roles, responsibilities and authority of employees who manage, perform and verify activities affecting the occupational health and safety (OH&S) risks must be established. The impact on the facilities, activities and processes shall be defined, documented and communicated to facilitate (OH&S) management.

- An audit programme will be established and maintained together with a procedure for periodic OH&S audits. Audit specifications are prescribed.

- Planning for hazard identification, risk assessment and risk control are done via established and maintained procedures for ongoing identification of hazards, the assessment of risks and the implementation of control measures for all activities and people having access to the workplace including visitors and contractors.

- Performance measurement and monitoring procedures will be implemented to ensure OH&S performance in accordance with objectives which will include both qualitative and quantitative measures for pro- and reactive measures of performance in terms of organisational needs be established.

- Skills and competence
  The series prescribe appropriate training, awareness and competence. Employees shall be competent to perform tasks that may impact on (OH&S) in the work-place. Appropriate education, training and/or experience will form the basis and define competence. Procedures are in place to ensure employees working in the various disciplines and levels are aware of:
  - the importance and conformance to the series’ requirements, policy and system consequences of their work actions
  - their role and responsibility to ensure compliance to the requirements of the series
  - potential consequences of deviating from operating procedures. The training procedures shall take cognisance of the differing levels of responsibility, ability, literacy and risk.

- Behaviour
  The organisation has implemented a behaviour based safety system with associated structures and processes to manage behaviour. Behaviour observations and leading indicator analyses are utilised to manage fatal risks.
• Standards and procedures for series compliance in terms of hazard identification, risk assessment and risk control, documents, data and operational control, record and record management, emergency preparedness and response are established. Standards and procedures for handling and investigating of accidents, incidents and non-conformances are established and implemented.

• Equipment

• All equipment is to be risk assessed. These assessments are to be properly recorded and data maintained.

• The organisation has implemented a visible, felt leadership process to improve Occupational Health and Safety. Safety meetings, safety drives, coaching of employees, odd shifts and recognition in the form of awards complement visible felt leadership.

• The organisation have both company and organisation specific safety rules that are communicated through the various programme elements and are aimed at entrenching OH&S practices in all organisational members.

In conclusion leaders define the vision and mission of the organisation, which are realised through the application of strategies and actions. The defined strategy is a result of an evaluation of the organisation and in terms of its existence within the external and internal environment, translated into actions. This however does not ensure commitment to the strategy. Leaders through their actions create commitment to the strategy and actions and mobilise people to achieve the objectives of the organisation. The control framework to ensure achievement is the balanced scorecard that acts as a monitor for progress in the achievement of the strategies. In organisational context a well-defined and executed safety strategy supports the overall risk management strategy of the organisation.

2.2.1.1.3. Leadership and organisational change

We live in a world that is constantly changing. In nature the daily change between day and night, light and darkness and the four seasons affect all organisms. From a human perspective we are born, grow up, we age and we die. Organisations do the same and the mergers, take-overs, de-listings on securities exchanges bears testimony to this.
Kotter (1996) argues that the forces that drive organisational change namely technology, international economic integration, maturation of markets in developed countries and the fall of communist and socialist regimes leads to a globalisation of markets and competition, creating more hazards or opportunities resulting in more large scale changes in organisations.

Strategic change occurs when choices about the fundamental direction of the organisation are to be made (for example product diversification), or when mergers or acquisitions occur, or in cases of restructuring and or re- engineering. An in depth thinking process is required before these fundamental changes are affected which is associated with strategic change. It stands to reason then that affecting strategic change is inseparable from strategic management and leadership.

There are two important aspects to be derived from organisations that have successfully transformed (Swanepoel et al, 2003). The first aspect refers to process in that successful change is associated with a multi step process that create power and motivation that surpasses the sources of inertia in the organisation. The second aspect refers to leadership. Swanepoel et al (2003) report that Johnson and Scholes (2002) argue the management of change is linked to the role of the strategic leader. High quality leadership drives the change process and not just good management and although management development is introduced by all big companies and learning institutions, little is done to teach and develop leadership. It has been stated that leadership affect the desired change in organisations.

Kotter (1996) proposes an eight - step process to affect major organisational change.
Figure 2 – 2: Eight step process to affect major change (Adapted from Kotter, 1996)

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Create a sense of urgency</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Analysis of markets and own position</td>
<td></td>
</tr>
<tr>
<td>- Address or initiate crises to focus attention</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>Establish a guiding coalition</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Managers and leaders that work in tandem lead the change</td>
<td></td>
</tr>
<tr>
<td>- The guiding coalition function as a team</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3</th>
<th>Create a vision and strategy to affect the change</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Break through resistance</td>
<td></td>
</tr>
<tr>
<td>- Create strategies to affect the vision</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 4</th>
<th>Communicate the change vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Use every communication possible to communicate the change vision</td>
<td></td>
</tr>
<tr>
<td>- Role model desired behaviour through the guiding coalition</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 5</th>
<th>Empowering broad based action</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Remove obstacles</td>
<td></td>
</tr>
<tr>
<td>- Adapt systems and structures to support the change vision</td>
<td></td>
</tr>
<tr>
<td>- Encourage new ideas, risk taking and actions to support change</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 6</th>
<th>Create short-term wins</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Sustain and accelerate change</td>
<td></td>
</tr>
<tr>
<td>- Reward change and wins</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 7</th>
<th>Consolidate gains and produce more change</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Grow internal interdependencies</td>
<td></td>
</tr>
<tr>
<td>- Use acquired credibility to change systems, structures and processes to support change</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 8</th>
<th>Anchor changes in the organisational culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Ensure new norms are lived through behaviour</td>
<td></td>
</tr>
<tr>
<td>- Train leaders in value driven leadership</td>
<td></td>
</tr>
</tbody>
</table>
The first four steps assist to defrost the status quo and prepare the organisation for change. Steps five to seven introduce new practices whilst step eight anchors the changes in the corporate culture. This approach confirms the three steps approach to organisational change as is reported by Sutherland, Makin and Cox (2000) as unfreezing, changing and refreezing the organisation.

The first step is to create a sense of urgency to initiate and mobilise action. Low overall performance standards, organisational structures focusing on narrow functional goals, internal measurement focusing on the wrong performance indexes, low confrontational or kill-the-messenger culture, happy-talk managers, busy or stressed people who are in denial and the absence of visible crises result in the institutionalisation of complacency.

Urgency can be created in various ways. In organisational context higher standards can be introduced via planning sessions, performance measures can be changed to focus on desired outcomes and rewards for confronting problems and resultant successes introduced. In the absence of crises, artificial crisis can be introduced for example by setting higher production targets or rates. The resultant shortfalls thus focus attention.

The second step requires putting together a guiding coalition that can direct the change process. Both managers and leaders who work in tandem are required in a guiding coalition. A good guiding coalition portrays four characteristics: 1) Position power require enough main line managers on board to ensure those left out cannot block the process 2) Expertise and experience is required from work disciplines to ensure that informed decisions are made 3) Credible people with good reputations are represented and 4) Leaders that can drive the change process are represented. Teamwork based on trust and a common goal is essential in the guiding coalition.

Step three in the process is creating a vision that breaks through resistance. A vision creates a picture of the future and serves three important purposes namely clarifying the direction to change, motivate people to action in the desired direction and coordinate actions of different people.
The fourth step is to communicate the change vision through every possible way and by having the guidance coalition model the expected behaviour of employees.

The fifth step is empowering broad based action. Unless employees assist, major change will not be possible. Structures, skills, systems are barriers to empowerment and these obstacles are to be addressed to ensure empowered employees.

The sixth step is to create short term wins to ensure that the change is sustained and accelerated and that the effort is worth it. Rewarding change agents also assist to take goals to the next step. The fine-tuning of strategies and undermining employees blocking change, create momentum for change and keep the bosses on board.

Step seven consolidates gains and produces more change. Increased competition require organisations to be faster, less costly and more customer focused and this results in the growth of internal interdependencies. Considerable effort is required in organisations where different forces impact on the behaviour of people and this can require a huge effort to change. The elimination of unnecessary interdependencies require an in depth knowledge of the functioning of the organisational systems.

Successful change results in acquired credibility, which acts as a catalyst for changing systems, structures and policies to fit the change. Many change initiatives can also be attempted simultaneously if a clear distinction can be made between leaders that lead the process and managers that implement the changes.

The eighth and final step is to anchor the changes in the culture of the organisation. Kotter (1996) defines culture as the norms of behaviour and shared values among a group of people. Changes can become null and void if new approaches have not been anchored firmly in group norms and values within the organisation. The importance of the eight - step process must be adhered to in sequence to affect the desired change and cannot be overstressed according to Kotter (1996).

The application of the eight - step process assist to affect required change initiatives within the organisation brought about requirements of the twenty first century.

The management of change become imminent in the twenty first century organisation, which is characterised by Kotter (1996) in terms of structure, systems and culture. With regards to structure fewer employees and rules will lead to non-
bureaucratic structures with fewer levels where management leads and the lower level employees manage.

Systems will depend on many performance information systems where performance data is distributed readily and widely supported by management training. The organisational culture will be externally oriented, empowering people to move and act quickly on decision making as well as being more risk tolerant. Leadership will bring this about. The successful organisations will adapt and move fast with changes, requiring from employees both leadership and management skills within the organisational hierarchy.

Organisations consist of systems, people and structures. Only people can bring about changes in the organisation. But as has been pointed out, change has an effect on people, who react to these changes in many different ways, which can either ensure successful change or jeopardise change efforts. The question arises how change and the effects can be measured on a personal level. Since change affects a person on emotional, behavioural and mental levels, understanding one's feelings, behaviours and thoughts becomes critical to assist one in taking personal responsibility for the eminent change one is being confronted with. Brock, and Salerno (1993) introduced ‘the inter change cycle’ consisting of a series of six stages anyone will pass through when dealing with any change.

![Change Cycle](image)

**Figure 2 – 3: The Change Cycle (Source: Brock and Salerno, 1993)**

51
The change cycle commences with a change intervention. The outer ring describes the stages a person will pass through and the inner ring in every stage describes the fee-lings, thoughts and behaviour experienced within every stage.

**It is not the strongest of the species that survives, nor the most intelligent, but rather the one most responsive to change**
- Charles Darwin

The first stage is loss and the primary emotional feeling associated with loss is fear. Attitudes and beliefs drive behaviour and both are internal processes that result in actions (externally). Change brings loss but this loss is neither good nor bad. Attitude determines which perspective is created. Consider moving to another job or town or being confronted with a serious illness. With this loss comes fear, for the known and the unknown and are expressed as hurt, frustration and physical and mental disorders at the extreme. Fear is also a sign that one feels inadequate to deal with a situation. In this stage thoughts are cautious as a result of the fear. Paralysed behaviour is the hallmark in this stage since no clear thinking and action is occurring. The skills that are proposed in this phase are 1) clearly define the change 2) establish desired outcomes and 3) distinguish between real and imagined fears.

The second stage is doubt and the associated emotion is resentment. On the upside resentment can become a challenge to motivate one to deal with the issues. On the downside feelings of anger or bitterness can originate which is time consuming. Thoughts in this stage are sceptical inhibiting the issues to be viewed from all sides. Used positively, scepticism causes questions to be asked to broaden one’s perspective of the issues at hand.

Behaviour becomes resistant in this phase due to threats being perceived rather than being real. The blame is expressed in aggressive behaviour that can be blatant or passive. The pro-posed skills are 1) reframe the change from negative to positive through context reframing by thinking of another context or situation where you or someone else would respond differently to the same behaviour 2) apply the law of cause and effect - everything you feel, think or do has an effect, therefore take
responsibility for your actions and 3) gather information that creates an accurate picture. An accurate picture provides a platform from where to act so the need for defending or blaming becomes obsolete.

The third stage is discomfort and is the make or break stage. When the reality of the change sets in, feelings of anxiety are experienced since one has a clear picture of the challenge but the worry of the possible effect that it will have is still current. Since the brain is working hard to sort information and present this to the conscious mind to use, mental chaos known as confusion sets in. This step precipitates learning. Behaviour is unproductive as a result of the experienced anxiety. The skills proposed to deal with this stage are 1) take mental action by listing thoughts and feelings in no particular order. This is a realistic self-check which provides meaning to what is experienced inside oneself and then applying the reframe process 2) creating mental distraction means doing something else like seeing a funny movie simply to distract the mind from the issues since time out can create a new perspective of the issues at hand 3) relieving the stress experienced in this stage is important and a commitment to physical activity can revitalise the body with the resultant benefits.

The first three stages and the danger zone warn one to stop and take cognisance of potential danger. It is imperative to move beyond the danger zone to complete the change process since getting stuck results in a never ending loop of stages one to three.

The strategies that are proposed to deal with the danger zone are to firstly recognise and then to avoid it. With regards to recognising the danger zone, four potential dangers with action strategies are proposed. The first danger is the overwhelming urge to give up because of the confusion, anxiety and stress experienced in the first three stages. By focusing on someone less fortunate, one’s circumstances get a different perspective. Re-consideration and re-focusing will provide the impetus to move forward. The second danger is to picture oneself as useless or hopeless since failure to complete tasks or goals can lead to that feeling. To do something that one is good at or rearranging one’s schedule or home assists in focusing attention. Danger number three is the belief that one can cover up the pain. One can’t since it intensifies. Someone trustworthy to talk to must be found but the truth must be shared and help sought. The fourth danger is the belief that one is working hard for
nothing. Anticipating the future will assist in creating focus by asking four pertinent questions. What would happen if I could stop the process of this change? What would happen if I didn’t stop the process and went forward with the change? What wouldn’t happen if I did stop the process of this change? What wouldn’t happen if I didn’t stop the change process and went forward?

With regards to avoiding the danger zone, five steps with actions are proposed. The first step is to be aware of the location of the danger zone and remain aware of the warning signs and costs of falling back to stages one to three by writing down the consequences. Step two is to increase one’s physical activity to combat anxiety and confusion that may lead to depression. Mild walking with a friend or garden work can assist. Step three is to stay committed and focused on the skills proposed in stage three by also writing down how this skill can fast track one’s forward mobility. Step four prescribes finding a partner that can assist with one’s change since it is easy to be drawn to someone who feels similarly. Regular scheduled meetings must be scheduled with a review on the stages of the change cycle as well as the skills applied in each stage. Intermittent meetings can assist between scheduled meetings to assist with creating and maintaining momentum. Step five requires mastering the skill of reframing any negative thoughts and feelings to positives.

Completing the first three stages assist in moving into stage four, the discovery stage. Caution is still in order since there might be issues still to be assimilated. Since the change is internalised and information is integrated a new perspective forms and this enhances one’s ability to seek and identify with others regarding the change.

In the discovery stage the emotion experienced is anticipation, which affects one’s attitude internally (feeling able to do something) and externally (perception of the world). In this stage thoughts are creative since choices and options are created. Behaviour becomes energised because of one’s being connected with the change. The associated skills are never to say no to any idea or suggestion, understand and practice perspective by seeing all sides to an issue, identifying and using one’s strengths (not just on oneself but on others too) and lastly by being willing to take risks (successful changers are moderate risk takers).
Understanding is the hallmark of the fifth stage. This is also called the green stage where one becomes ready to embrace the change and move through the change process. Where the previous stages were associated with anxiety, confusion and unproductive behaviour, feelings in the understanding phase are confident since understanding is improved. Thoughts are pragmatic since common sense prevails. Once this occurs, one’s thinking becomes more flexible and the many dimensions of the change can be observed. This results in more deliberate thinking and actions. Since actions become more deliberate, more can be done giving rise to self – esteem, which contributes to added energy and focus. It becomes a self-feeding process especially when the benefits of the change are identified and realised. The skills associated with this change are 1) identify the benefit 2) give credit where credit is due and 3) celebrate progress.

The sixth and final stage can be pursued by integrating the change and internalising it.

When balance is created, feelings of satisfaction emerge. Thoughts are focused with resultant success in time management, contribution to family increases and energy levels surge, which contribute to the attainment of balance. The skills associated in this stage are 1) gain new knowledge by creating a future view because learning can now be enhanced 2) offer assistance to others through demonstrated leadership and 3) be flexible. This will enhance the internalisation of any change. Depression for instance is a big illness of our time and Brock et al (1993) propose patterns to recognise traps in every stage. The first pattern is to avoid getting stuck in any stage since multiple changes (the second pattern) may be experienced which will greatly affect any individual unable to progress through the stages. Understanding the cyclical correlations of every stage assists in determining which stages one is bound to experience the most difficulty with by looking diagonally across it. If doubt is the hardest, then understanding is likely to be intensely experienced as well.

Whether change is experienced as traumatic or exciting for the individual, a group or an organisation, the success will depend on the process as well as the methods adopted to implement and measure the progress. The eight-step process and the change cycle assist in achieving this goal (Brock et al, 1993).
The organisational change process and the leadership role in the change process not only create extreme discomfort in the organisation and the people affected by the change, but also affect the leadership that must steer the organisation and the people through the change to overcome numerous hazards or difficulties that are encountered.

Heifetz and Linsky (2002) argue this has the potential to make or break the leader and offer a two part tactical survival approach during this trying time. The first part refers to an outward (external) process looking at the organisation and the people in it and the second part an inward focus on the needs and vulnerabilities of the leader. Heifetz et al (2002) argue that the external environment is hostile where people oppose change, new structures and ways of working are prone to internal conflicts. Four techniques are proposed to minimise these threats: Firstly, to operate in and above the fray requires the leader to maintain the capacity for reflection as events unfold. The reflection must be directed at the person itself as well as events that happen or as the strategy is implemented. Secondly the uncommitted have to be courted; these are the middle level of employees who have no direct stake in the change initiative but are influenced by the change process. They need to experience that the leader is serious but the leader also understands the effects of the change.

Practising what the leader preaches and acknowledging personal responsibility assists in creating understanding and support. Thirdly, the conflict that arises as a result of the change process requires the leader to manage them. A secure place, where the conflicts can be aired as well as controlling the temperature of the conflict to avoid it becoming destructive are two tactics that can be applied. The leader in a change process has to perform a delicate balancing act by creating enough tension to motivate change as well as keeping the people on board. This requires being acutely aware of the tensions at play. Fourthly by placing work where it belongs assist in establishing transformation as well as solving problems of authority and accountability. This keeps people involved and ensures that change is sustained. By challenging employees to take responsibility and action, the leader displays courage and leadership. The second tactical approach, namely the inward process refers to aspects within the leader. Since the intellectual, physical and emotional challenges
that confront the leader are demanding, personal reflection to assess the impact that
the challenges are having on the leader is essential. Heifetz et al (2002) offer two
actions for leaders to address the inner self. Action number one is to manage
hunger. The two most dangerous hungers are desire for control and for importance.

All organisations need order but more so in times of turmoil, which accompanies
change. An over desire for control inhibits the organisation to work through
contentious issues. Aligning control with placing work where it belongs as well as at
the respective levels is imperative for embedding the change initiatives and
empowering the people responsible for controls. Heifetz et al (2002) reason that
most people have some need to feel important and affirmed by others. The inherent
danger in this affirmation is that it may lead to an inflated view of oneself and one’s
purpose, leading to self-deception. Doubt plays an important part here. Doubt
reveals parts of reality that is not normally seen and the absence of doubt leads one
to see only that which confirms one’s own competencies which lead to disastrous
missteps. An inflated sense of self-importance also has another harmful effect in that
dependence on the leader is created. This denudes people of the responsibility of
moving the organisation forward.

The second action to address the inner – self that is suggested is to anchor oneself.
steadying and stabilising oneself is achieved through finding a safe harbour where
one can reflect on events, repair psychological damage incurred, renew emotional
resources and recalibrate one’s moral compass.

Where possible a confidant who is not a co - worker and is not confused with an ally
(who may be lost when new issues emerge), is someone one can talk to about what
is on the heart and mind without being judged or betrayed. The leader also needs to
distinguish between the personal self (which serves as an anchor in rough weather)
and the professional role that is required.

When people attack a person in authority they attack the role of the leader and the
effects that it has on their lives. By distinguishing between the two and not
experiencing these attacks personally the leader avoids becoming the issue.
Although difficult, it is imperative to distinguish the self (person) from the role
required. This enables one to be calm, focused and persistent in engaging people in tough issues.

There is an inherent danger in protecting oneself as a leader.

Heifetz et al (2002) argue that one can lead and stay alive but by deploying protective devices, the leader deprives him or herself from an acute experience of living. These protective devices are:

- Cynicism, which is often disguised as realism, undermines creativity and a daring attitude
- Arrogance posed as authoritative knowledge inhibits curiosity and questioning approach
- Callousness portrayed as thick-skinned diminishes compassion for others.

Although leadership and power is related to the latter, it is not enough to make the challenge worthwhile. Leaders engage themselves in challenges in order to make a positive influence in the lives of others although these challenges may be painful. Bearing this pain is offset against the positive changes that leaders make on the lives of others and themselves.

A case for change

An increased pressure internationally and locally to change the incidents, injuries and fatalities in industries become evident when the comments and data of respective agencies are considered. Schutte (1998) reported that according to the National Safety Council in the USA, direct costs of compensation as a result of incidents were up to fifteen times higher than total costs of the industry. This was only the direct cost. Hidden costs of lawsuits, re-training, replacements, production interruptions, increased insurance premiums and the effect on morale and productivity as a result of incidents are not even included.

In Britain the picture is also severe as 2000 lives could be saved annually if procedures were adhered to. Between 70%-88% of all injuries are behaviour related and when 95% of all behaviours occur in the unconscious state, the human behaviour element contributing to incidents require serious attention (Sutherland et al, 2000). The reality and result of safety (or lack thereof) implies trauma to people,
high costs, production losses, lower productivity and morale as well as impact on competitiveness.

Occupational health and safety locally and abroad is attracting increased attention, not only from Unions but also from the investment and insurance communities. Considering safety in the mining industry and specifically the platinum mines in South Africa, an increase from 46 fatalities in 2000 to 64 in 2004 (an increase of 39%) is reflected. The high cost of ineffective safety management is reflected in these statistics as well as rising costs as a result of insurance payouts and premiums, compensation, lost production, retraining of new incumbents and unwanted media attention. The chairman of the target organisation reflected in this study has publicly stated recently in London that the high fatality rate is unacceptable and needs to be changed.

The Chamber of Mines of South Africa provides mining industry statistics on injuries and fatalities and table 2 –1 below reflects the fatalities in the platinum industry from 1995 to 2006.

### Table 2 – 1: Number of fatalities in the platinum industry

<table>
<thead>
<tr>
<th>Commodity</th>
<th>'95</th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'00</th>
<th>'01</th>
<th>'02</th>
<th>'03</th>
<th>'04</th>
<th>'05</th>
<th>'06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platinum</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>40</td>
</tr>
</tbody>
</table>

Sutherland et al (2000) propagate a move away from the traditional approach to safety to a behavioural and continuous improvement process. Traditional approaches to safety are reactive in nature in that incident investigations (accidents are acts of God and, by the way, very few) are concerned with events that occurred and which are used to learn from. Although the re-active strategy has value for information derived from investigations, it is incomplete and flawed and Sutherland et al (2000) argue:

- It is both ethically and morally wrong to wait until something has occurred before action is taken since someone is already injured, maimed or killed.
- The attention of the workforce is focused on a negative event and not quite on the desired behaviour.
- People may think it is not applicable to them and incidents happen to someone else
- When it involves horror it brings defensive mechanisms into contention
- The impact differs from people already working under safe (positive) conditions to those not working under safe conditions (negative).
- It is costly to learn from mistakes in a changing business environment
- The data gathered from these investigations are simply not enough to derive scientific conclusions and in addition, all incidents are not reported.

Sutherland et al (2000) add another layer to the accident ‘iceberg’ called behaviour.

Figure 2 – 4: The accident iceberg (Source: Sutherland et al, 2000)
The behaviour-based approach to safety according to Sutherland et al (2000) is pro-active and assists work groups and teams to actively consider the potential for incidents as well as their own safe or unsafe behaviour before an incident occurs. The behaviour-based approach also specifies desired behaviour.

The behavioural approach thus focuses on behaviour and not attitudes and secondly emphasises the encouragement of desirable behaviour rather than the punishment of undesirable behaviour.

Since employees are aligned to individual and group behaviour in a group context, the way opens for empowerment by creating job ownership and commitment, decision making authority with the resultant responsibility, performance management and contributing employees. The high demand-pressure culture requires all to take responsibility and not just a few employees (Sutherland et al, 2000).

In the mining industry with wide underground workings it becomes a business imperative to address safety from a behavioural approach. Visible supervision can only contribute to a certain extent. The people who know more about the problem (safety) are those who work with it everyday.

Many organisations wait for something to happen before they react. This usually coincides when a situation has deteriorated to a level of dissatisfaction. Sutherland et al (2000) describe this in terms of zones varying from action to satisfaction to relaxation depending on the threshold levels. When the level of discomfort is reached, reactions are accompanied by e-mails flying, banging palms on tables, ad hoc safety training with the accompanying flyers and posters all crying for improvement (Sutherland et al, 2000).

![Figure 2 – 5: The accident behaviour safety cycle (Source: Sutherland et al, 2000)](image-url)
In the behaviour approach to safety, all employees are involved by focusing on safety from a pro-active perspective.

Before the theory underlying a behaviour – based approach is discussed, it is necessary to examine the factors that influence safe behaviour. Early studies reported personality traits, attitudes as well as organisational culture and climate as factors contributing to behaviour. However, with the introduction of risk management into organisations, perception of risk and risk decision- making were added (Sutherland et al, 2000).

Personality traits are associated with terms like accident proneness, negligence or people having a bad safety attitude as contributing to unsafe behaviour. However the cause of peoples’ behaviour (and ones’ own), is addressed through the attribution theory. Two main types of explanation for the causes for behaviour are offered. The first refers to internal factors as mentioned above and the second (external) as reacting to the demands of the particular situation. To change internal factors may require psychological processes and in the second instance it is easy to blame others or something external for ones' failures. Sutherland et al (2000) argue that the assumption that attitudes cause behaviour is not the complete picture. Attitudes and behaviour are more interrelated than a mere cause and affect equation. Sufficient evidence exists to confirm that behaviour changes attitudes as well.

Sutherland et al (2000) describe attitude as the psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. There is thus a stimulus presented to which a response is elicited. Attitudes also find expression in three ways namely cognitive (thoughts) for example ‘my boss is an autocrat’. The second way is affective (emotional) for example ‘I hate autocrats’ and thirdly conative (behavioural) where, as a result of the aforementioned, the boss is avoided, challenged or negotiated.

Brock et al (1993) state that attitudes determine how we see ourselves and other people and this knowledge is integrated into life experiences. Beliefs are basic truths, which form the foundation from where action is taken.
The theory of reasoned action explains the link between attitudes and behaviour being strengthened by measuring specific attitudes towards specific behaviours. In practice this means that behaving in a specific way is the result of a deliberate consideration of possible outcomes of that specific behaviour. The process to derive a specific decision results in an intention to behave, which Schutte (1998) explains as safety intent with regards to safety. This will be addressed in the second part of this chapter where the Safe Human Mindset measuring instrument and safety intent from a theoretical and literature perspective.

Sutherland et al (2000) propose a model to explain the relationship between intention and behaviour:

![Figure 2 – 6: Intention and behaviour (Source: Sutherland et al, 2000)](attachment:image)

Attitude is explained in terms of the three components as was discussed above namely cognitive (thoughts), conative (behavioural) and affective (emotional). Attitude is produced when beliefs (about the consequences of a particular behaviour) and the consequences (of the particular behaviour) are individually assessed against each other, which result in a specific attitude. Consider the belief in hearing protection aids (being uncomfortable or a hassle) and the evaluation of consequences of not wearing protection. The evaluation of both gives rise to an attitude of wearing or not wearing protection.

Subjective norms are created by beliefs of important people to the behaviour and individual compliance to the wishes of these important people. For example protection is not worn because the person is indifferent to the reaction of team members. Although the theory of reasoned action strengthened the link between
attitude and behaviour, the theory of planned behaviour expands on the theory of reasoned action by introducing the concept of perceived behavioural control. Perceived behavioural control (PBC) is a total assessment of behaviour being exercised or not, by evaluating both the situation and oneself, whether the resources are available and the strengths of obstacles in the way of exercising the behaviour.

Sutherland et al (2000) argue that habits and planning have specific relevance to safety. Since much work is repetitive by nature, past behaviour strengthens the foundation of future behaviour causing habit forming (behaviour which is exercised automatically).

There is thus no relation between habits and attitudes with habits directly influencing behaviour. Planning and the effects thereof strengthen the intention to behave as well as the behaviour. Strong plans eliminate the effects of attitudes on behaviour.

Two theories that explain the effect of behaviour on attitudes, cognitive dissonance (developed by Festinger, 1962) and self-perception theory as proposed by Bem (Sutherland et al, 2000).

According to Sutherland et al (2000), cognitive dissonance theory argues that people like to see themselves and be seen by others as being consistent for example between attitudes and behaviours. When there was dissonance between attitude and behaviour, psychological tension would be experienced by the individual. This tension needed to be reduced or eliminated and this occurred in various ways. If the tension was as a result of a contradiction with one’s attitude (forced to ignore safety rules for the sake of production), the tension was released by justifying behaviour (forced). However if it was voluntary, behaviour could change the attitude by using external inducements. In this way the behaviour could not be justified in terms of these inducements. The only way was to change attitude. Cognitive dissonance theory is concerned with attitudes (strong) that are involved in a persons’ self-identity and the dissonance between these attitudes and behaviour. From a safety perspective dissonance exists when a persons’ positive attitudes towards safety is not reflected in behaviour. To relieve the tension created by the dissonance, pressure to change attitude would exist. If behaviour is caused not by attitude but by
external influences (production pressure), little change will occur since the person justifies behaviour on an external influence. When these external influences are removed, no justification exists so the person changes either attitude or behaviour (Sutherland et al, 2000).

According to Sutherland et al (2000), self-perception theory suggests that we infer our own attitudes in a similar way that we infer the attitudes of others, i.e. we make assumptions about behaviours, be they our own or those of others. This worked best where attitudes were weak for example the wearing of personal protective equipment. A behaviour-based approach to safety is largely founded on these theories. As was mentioned above, risk and risk decision making also plays an important role in safe behaviour. Risk is assessed by weighing the probability of something occurring against the cost of the occurrence. Combined these two factors form a risk assessment. The basis of this assessment is then used to make a decision for example to fly rather than drive to a destination.

By changing to a behaviour based approach to safety, a continuous focus is created since more employees are involved and take responsibility for safety and not just managers or safety departments thereby creating a more pro-active approach to incident prevention and safe behaviour (Sutherland et al, 2000). Strong leadership however must affect this change to a more pro-active approach. By placing more responsibility on behaviour, management also place controls to the levels where behaviour is exercised. This is a specific pursued strategy calling for a planned change approach exercised by the leadership of the organisation. This type of change is pertinent when the safety statistics of mines in South Africa are considered. The changes need to be initiated from executive level in a planned approach considering all organisational factors.

A proactive approach to safety that is behavioural - based and aimed at continuous improvement places the responsibility and control in the hands of workers who are most accustomed to perform the tasks. The role of management is to specify desired behaviour and to introduce schemes that encourage safe behaviour. Planning with the focus on improving behaviour by removing obstacles to performance has the benefit of migrating control to the various organisational levels.
By changing to a behaviour based approach to safety, a continuous focus is created since more employees are involved and take collective responsibility for safety and don’t leave it to just managers or safety departments. Strong leadership however is required to affect this type of change at all organisational levels through the application of the change cycle process.

2.2.1.1.4 Leadership and organisational culture and climate

2.2.1.1.4.1 Introduction

When establishing an organisation, whether it is new or transformed, it is up to the leadership to create, install and maintain (adapt when required) a climate conducive of performance, create identification with the organisation and establish a culture of shared values and beliefs that will direct activities and behaviour to the achievement of individual and organisational goals. There are two aspects pertaining to the organisational culture that need to be explored when leadership in an organisational culture context is discussed. The first aspect refers to organisational culture, which is commonly described as the way things are done and the second aspect refers to the cultural diversity of the various employees within an organisation. Leadership has a profound impact on both.

2.2.1.1.4.2 Organisational culture and climate

Yukl (1994) argues that all efforts to transform or revitalize an organisation have little chance of success unless the culture is changed who also opines that the basic assumptions and beliefs shared by the members of a group or organisation reflect its culture. Assumptions and beliefs involve the view of the group of their world and their place in it, the nature of time and space, human nature and relationships. Robbins et al (2003) view organisational culture as a system of shared meaning that is experienced by members of the organisation. This shared meaning distinguishes one organisation from another.

According to Yukl (1994), Schein (1985) distinguishes between beliefs (which may be unconscious), and espoused values, which may or may not be consistent with these beliefs. The culture will be accurately reflected when espoused values are
consistent with underlying beliefs based on prior learning. Leaders have the greatest potential for embedding and reinforcing culture through five primary mechanisms (Yukl, 1994):

• Attention
The phrase ‘whatever gets measured gets done’ is exercised by the leader when communicating priorities and values through inquiring, measuring, and commenting on or praising and criticizing activities such as planning, review meetings or practicing management by walking around. Emotional outbursts serve as reinforcement of values and expressing concerns. An example is a leader who deals with an unsafe condition through either coaching or reprimanding a subordinate. By the same token, failure to respond also expresses a message that the issue is not important.

• Reaction to crisis
The emotionality surrounding crises increases the potential for learning about the values and underlying assumptions. An example is when faced with an economic crisis all staff agrees to reduce working hours with less pay as an alternative to layoffs and job reductions. This would communicate a strong concern for preserving jobs.

• Role modelling
Through their own actions, leaders communicate values and expectations by going the extra mile by doing work beyond the normal call of duty. This emphasizes loyalty and self-sacrifice. Strict adherence to policies and procedures focus on what is important and required in given circumstances.

• Allocation of rewards
By promoting or increasing salaries through established criteria the leader communicates what is valued and important. Formal recognition awards and ceremonies also communicate what is important and emphasised in the organisation.

• Criteria for selection and dismissal
Leaders strengthen the culture by appointing people who have specific values, skills and or traits or by promoting them to positions of authority. Clear job criteria and selection processes also screens out unsuitable applicants. Through the
establishment of codes of conduct and procedures to dismiss employees, leaders communicate what is important and valued.

In addition to these primary mechanisms, Yukl (1994) refers to Schein’s (1992) proposal of five secondary mechanisms that are useful to reinforce and embed the organisational culture specifically when they are consistent with the primary mechanisms:

1) organisational structure design emphasises either centralised or decentralised autonomy and rigid management (autocracy) or promotes teamwork 2) systems and procedures design places emphasis on issues of importance for example formal strategic plans and budgets, controls, performance reviews and leader, supervisory and management development programmes 3) designing facilities intentionally assists to reflect basic values for instance open plan offices reflect open communication and teamwork, similar offices and dining areas reflect egalitarian values 4) stories, legends and myths may be more a reflection of culture than an intentional way of promoting it. Successes of historically disadvantaged employees may promote the issue of equity but also inspire others to perform and rise in the organisational hierarchy whilst breaking barriers of inferiority and diversity 5) formal statements of values and written creeds communicates only a limited portion of the cultural beliefs of an organisation and are used as supplements to other mechanisms.

It is only when the organisational culture becomes institutionalised (embedded) that it provides members of the organisation with a common understanding of which behaviour is appropriate and meaningful. This occurs in the re-freezing stage of organisational change, which is discussed in the section on leadership and organisational change. Robbins et al (2003) define seven characteristics of the culture of an organisation:

1) innovation and risk-taking refer to the degree to which employees are encouraged to be innovative and take risks. Risk in this context does not refer to compromise safety when performing a task but refers to risk that will grow the organisation. 2) attention to detail describes to what extent employees are expected to be analytical, precise and pay attention to detail in performing their work 3)
outcome oriented framework refers to the extent management focuses on outputs and results rather than the inputs, systems and processes applied to the achievement of results 4) people orientation describes to what extent management considers the impact that decisions have on employees 5) team orientation describes the degree to which work activities are organised around teams rather than individuals 6) aggressiveness describes the degree to which employees are aggressive and competitive rather than happy go lucky and 7) stability refers to the extent the organisational activities are organised to maintain the status quo rather than focus on growth.

Robbins (1996), states that when culture is measured, respondents react on how the culture in the organisation is perceived at a given point in time. By rating the issues described above as for example high or low, culture is descriptive by nature. Organisational culture, according to Robbins et al (2003) also has distinct functions. Firstly it creates distinctions between one organisation and the next. Secondly it creates identity for the members that belong to the organisation. Thirdly it fosters commitment to something larger than self- interest. Fourthly it sets standards of behaviour that act as stabilisers in the social order of the organisation and fifthly serves as a control function by shaping and guiding members’ attitudes and behaviour.

The influence of a leader on the organisational culture of an organisation varies depending on the developmental stage of an organisation according to Yukl (1994). In a new organisation, culture is not embedded and the leader needs a vision, which is consistently reinforced to avoid a dysfunctional culture. The belief about the distinctive competence of the organisation that differentiates it from the competitors, are an important element in the culture of new organisations and reflects the uniqueness and superiority of products and services.

In young and successful organisations the culture tends to be strong since it is instrumental to its success. An organisational culture, which is strong (core values are held strongly and shared widely), reflects members’ acceptance and commitment to values. Robbins et al (2003) state that one benefit of a strong culture is increased behavioural consistency. In the mining industry, the high formalisation of rules and regulations through legislation, assist in creating predictability, orderliness and consistency. Leaders create organisational culture by selecting people who think and
feel likewise and then through indoctrinating, influencing and socialising shape the people into the desired culture. Through active role modelling behaviour, identity with the leader and internalising of values and beliefs are established (Robbins et al, 2003).

Over time the culture develops and as the organisation matures and other leaders emerge in departments or divisions, sub cultures form which can inhibit an organisation to adapt or transform to new challenges. Since culture also influences the selection of leaders, drastic changes become difficult unless a crisis is imminent, making changes to an existing culture more difficult (Robbins et al, 2003). Once organisational culture has been created, maintenance and sustainability is required. This occurs in various ways. Selection or de-selection of people, who fit or do not fit the culture, assists to strengthen the culture. Leaders also role model behaviour through what they say and do, which act as norms for conformance of people in the organisation. This affects to what extent people are free to act, the way the organisation is managed (autocratic vs. democratic) as well as performance and promotion standards are applied (Robbins et al, 2003).

- he who only knows his own generation remains always a child
  - Cicero

Robbins et al (2003) postulate that culture is established through learning and maintenance. Organisational culture is also introduced as well as learned. When a new employee enters the organisation, the culture is encountered. By working through problems encountered with the culture, the employee evaluates compatibility, changes and becomes comfortable with the organisational culture or, alternatively, leaves.

Cultural maintenance is important for the continued effectiveness of the organisation. Both cultural change and maintenance leaders articulate ideology, communicate strong convictions and high expectations and confidence in subordinates, motivate commitment to objectives and strategies and serve as role models. Cultural maintenance leaders however affirm existing values and beliefs appropriate for continued success and only affect incremental changes whereas cultural innovation leaders are more dramatic and expressive in promoting new values and strategies.
supporting radical ideologies (Robbins et al, 2003). Organisational culture learning takes place through conveying stories of success. Values are learned when honesty for example is rewarded and when success is celebrated, the rituals are learned.

From a safety perspective, Sutherland et al (2000) state that culture is a group phenomenon consisting of shared values and beliefs. Although Sutherland et al (2000) group climate and culture together, Schutte (1998) distinguishes between culture and climate from an organisational perspective. This will be addressed in the second part of this chapter where the theory of the theory of the Safe Human Mindset will be discussed. Suffice to mention that climate according to Schutte and Botha (2001) evolves around attitudes about the job and organisation (workforce satisfaction), work environment and perceived supportive relationships in organisational context (work environment and supportive relationships). These dimensions reflect the life experiences or climate of the organisation. Similarly, Schutte et al (2001) argue that workforce satisfaction has a great effect on employee loyalty and motivation reflecting the motivational intent of the workforce, which have a direct bearing on behaviour.

**Workforce diversity**

According to Robbins (1996), globalisation not only has the effect that international markets are becoming accessible and multinational companies across the globe are established, but employees and managers of these multinationals are working in different countries representing their organisations. This form of diversity is called international diversity and has implications for the leadership of multinationals to adapt not only to the culture of the country in which they operate, but also to adapt their organisational cultures to accommodate the cultures of the countries within they operate. Robbins (1996) argues that as a result of this, the workforce is becoming intra-nationally diverse allowing for interchanging between different countries with diverse laws, political systems and customs. The European Parliament and the African Parliament for example are institutionalising diversity in terms of trade agreements and people movement.
Diversity is however also experienced at national level. Robbins et al (2003) postulate that national culture affects leadership style through subordinates and studies report that national culture has a greater impact on employees than the organisational culture within which they operate.

In the South African context the workforce and national sports teams are increasingly representing the demographics of society. Legislation promoting equity and The Mining Charter for instance is promoting diversity for example women in mining with targets and time frames for achievement. This according to Robbins et al (2003) poses a challenge for the leaders of organisations who must manage the paradox between recruiting the diverse people and making them accept the core values of the organisation within which they work but simultaneously acknowledging and supporting their differences.

As effective leaders adapt their style and do not use any specific style, they are bound by the way they do things in terms of what subordinates expect. The challenge for leaders in multinationals as well as leaders in diverse organisations is to know these expectancies and adapt to changing demands (Robbins et al, 2003).

**An ethical man is a Christian holding four aces**
- Mark Twain

It has been reasoned that in the global economy, employees and leaders frequently interchange as required by the multinational organisations. Working and leading cross culturally thus becomes imperative. Considering the diverse cultural composition of South African society, cross-cultural leadership is also required. In a cross-cultural leadership study in Western Africa, Hale (2004) argues that cultural outsiders have a responsibility to model successful leadership that can serve as a catalyst for the creation of effective models of leadership. Hale (2004) associates cross-cultural leadership in the Western-African context with servant leadership (which is based on biblical grounds where Christ’s approach to leadership is to worship God and serve the welfare of others) and transformational leadership (which is discussed in the section transactional and transformational leadership).
The essence of leadership is not giving things
or even providing visions. It is offering oneself and
one's spirit
- Lee Bolman and Terrence Deal

Within organisational context where safety is concerned, Hidley (2004) states that leadership is one of the most crucial factors contributing to organisational success and to safety effort. Since the leadership role, more than anything else shapes and influences the culture that produces performance outcomes, with regards to safety, demonstrated leadership is found to be one of the most critical aspects.

Petersen (2004) argues that the effectiveness of a safety system depends on the prevailing organisational culture since employees’ perceptions of culture dictate or direct their behaviour and ultimately organisational results. The evidence that leadership adopts and supports a safety culture according to Abrahamsen and Zastowny (2003) is evident in 1) leadership actions that demonstrate a fundamental understanding and strong commitment to safety 2) safety governance in the organisation aimed at receiving, reviewing and acting upon safety issues in a timely manner 3) leadership demonstrate qualifications and competence to lead and participate in safety initiatives 4) visible felt leadership demonstrate safety as priority 5) leadership demonstrate contemporary knowledge of safety initiatives from local to international levels 6) support the reduction of high risk activities 7) leadership display competence in applying the tools for safety improvement for example root cause analysis and improvement techniques and 8) a learning culture is prevalent.

Employee driven efforts are critical to safety in the workplace and leadership needs to adopt a developmental approach to leading by providing direction without inhibiting employee involvement. Leadership impacts on every level in the organisation and more than anything else on downstream outcomes. This link needs to be developed and leveraged at every level in the organisation to achieve organisational goals (Abrahamsen et al, 2003).
Hidley (2004) propagates three advantages of connecting leadership to safety 1) Leadership strengthens behaviour-based safety efforts through strengthening employee efforts 2) Strong safety leadership supports all safety efforts and goes beyond safety leadership to organisational leadership by leading with safety into other areas and 3) Leadership in safety improves leadership in other areas since a safety improvement culture invariably impacts on employee performance, accomplishment and enjoyment.

Hidley (2004) proposes a three-pronged approach in strengthening leadership. The first approach is to establish where one is and where one wants to be through a gap analysis. The second aspect is to identify the leadership behaviours critical to close the gap and thirdly sustain the process through a continuous leadership development process.

Since it is the responsibility of the leadership in organisations to establish an organisational culture that elicits behaviour of performance, leadership in organisations need to be well aware of the functions of organisational culture and the mechanisms to embed the desired climate and culture in their organisations. Increased diversity in the work-place demand from leaders to adapt their leadership style since the required leadership in transforming and changing organisations differs vastly from the leadership exercised in maintaining organisational climate and culture. National culture influences organisational culture and effective leaders know these differences and how to respond to the challenges in a different way (Robbins et al, 2003).

In leading in a diverse cultural society, servant leadership that empowers employees and creates trust form the basis of successful transformation. When the leadership in the organisation creates a safety performance culture, performance is sustained across functions. This involvement strengthens the employee driven safety efforts creating a partnership between management and employees resulting in a culture of (safe) performance.
2.2.1.1.5 Leadership Care and Growth

Every person in a leadership position has the responsibility to develop subordinates. By providing the means to do a job, the ability to perform and keep people accountable, employees are developed and ultimately empowered. However there is an aspect called transference that has enormous power and leaders are advised to not only be aware of its consequences, but also manage the phenomenon (Schuitema, 2004). Establishing sound relations with subordinates lay the foundation for caring and growing employees. Although performance management as well as career development systems are instruments in processes of equipping leaders to develop subordinates, it will be argued that these are insufficient and need to be complimented by a caring and development or growth process.

In the South African context of a shortage of skills, skills development and equity are legislated to assist with fast tracking of employees to unleash human potential thereby addressing the inequalities of the past.

In the organisational context, the superior (leader) and the subordinate are in a specific hierarchical relationship. Considering popular definitions of leadership as achieving results through people, leadership can be stated as getting people to do what you want them to do. This by implication introduces the notion of choice to follow by a subordinate as well as power held by the leader. Schuitema (2004) reasons the exercising of power to ensure followers is in essence what leadership is about and the way it is exercised in the leader (superior) and follower (subordinate) relationship, created legitimacy for the leader. It is only once legitimacy of power has been achieved that a leader can care and grow subordinates (Schuitema, 2004).

Before examining the exercising of power in caring and growing of subordinates further, it is imperative to discuss a fundamental issue which influences attitude and behaviour, namely values. Robbins (1996) describes values as specific modes of conduct or an end - state of existence and are personally or socially preferable to opposite modes of conduct or end - states of existence. The main element contained in values is judgment, which carries an individual’s idea about what is right, good or desirable. Values have both content and intensity attributes. Content refers to the importance of a mode of conduct or end-state of existence and intensity refers to a
relative ranking of how important each value is. The content and importance of values form a persons' value system, which generally influences attitudes and behaviour. Robbins et al (2003) describe values in terms of terminal values comprising end-states of existence for example self respect, and instrumental values as preferable modes of behaviour for example honesty.

Schuitema (2004) emphasizes values and argues that in any interaction one engages with another person, an underlying value is operative in that interaction for example in communication, honesty is the underlying value. Values are bigger than the person and are only sincere when one stays true to them, especially where self-interest is at stake.

The leader for today and the future will be focused on how to be - how to develop quality, character, mind-set, values, principles and courage
- Frances Hesselbein

The debate of a difference between leadership and management is furthered, not through behaviour but through motivation or intent. Intent is oriented in two ways either to the self and self-interest (one gives in order to get or one is there to get) in other words one is there to take, or one is oriented to others, to give (Schuitema, 2004).

Giving can take two forms namely things or significance whilst one either takes objects or significance. Schuitema (2004) introduces a model to explain the difference.

<table>
<thead>
<tr>
<th>SIGNIFICANCE</th>
<th>TAKING</th>
<th>GIVING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objects</td>
<td>Megalomaniac (-2)</td>
<td>Leader (+2)</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Needs-based</td>
<td>Consumer (-1)</td>
<td>Virtuoso (+1)</td>
</tr>
<tr>
<td>behaviour</td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Victim</td>
<td></td>
</tr>
<tr>
<td>Values-based</td>
<td></td>
<td></td>
</tr>
<tr>
<td>behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Values-based</td>
<td></td>
<td></td>
</tr>
<tr>
<td>behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 – 7: Intent: Giving or Taking (Source: Schuitema, 2004)
Schuitema (2004) states that megalomaniacs base their behaviour on the need to be made significant by others and find expression by being either autocratic or democratic. The autocratic part is about achieving significance by directly and deliberately getting others to serve the self of the megalomaniac. Another megalomaniac need is the need for control since others cannot be trusted and must be governed with an iron hand. Megalomaniacs ensure that people dance to their tune by holding their fate in their hands. The underlying need is the need for power. The democrat however must ensure that as control is relinquished total abdication is not fostered. Affiliation is another need that all people have to a lesser or larger extent. This however becomes a danger for the megalomaniac democrat when closeness is set as a precondition for friendship. Such people cannot be trusted in positions of exercising authority since decisiveness will suffer and doing what is right and just falls by the wayside when issues of values are at stake (Schuitema, 2004).

Consumers are concerned with physical and security needs, the lower order needs as described by Maslow. Consumer leaders do not foster relationships since the key ingredients of loyalty and trust are absent. Since the focus is on getting, the consumer does not focus on contributing (Schuitema, 2004). Attention to what is right suffers when needs have to be satisfied, affecting job satisfaction which sometimes demand dealing with unpleasant issues.

Virtuosos throw themselves into their jobs heart and soul and find significance through doing a job well. Giving and growing is achieved through doing a job and by learning, which requires moving from the unknown to the known. This requires an element of risk, which demands courage. Two aspects are associated with virtuosos. Firstly, excellence and quality takes precedence over quantity in performing a job. The second aspect is aesthetics where excellence is appreciated but not necessarily where relations with people are concerned but in comprehending the natural world (Schuitema, 2004).

Leaders base their behaviour on values, which are based on significance of people. Respect is the core value hence the leader will not do something that may injure people. Intent finds expression in values of truth, caring and growing of people who work for them, respect through granting significance to others and not the self, co-
operation in pursuing team goals and not self-interest and justice by keeping people accountable. This is achieved through consistent and appropriate actions, decisiveness by being able to ‘hang a friend’ if need be, and most of all by bashing barriers through removing controls or hurdles that inhibit people to perform (Schuitema, 2004).

The caring and growing of people has its origins in the Path-goal theory developed by House and is described by Robbins (1996) as a contingency model of leadership. The basis of the theory is that it is the responsibility of leadership to assist followers in goal attainment as well as providing the required direction and support to align their goals with operational goals. Path-goal theory explains the degree to which subordinates view leader behaviour as an immediate source of satisfaction or future satisfaction.

According to Robbins (1996), leader behaviour is motivated to the degree it 1) makes subordinates need satisfaction contingent on effective performance and 2) provides the coaching, guidance, support and rewards that are necessary for effective performance. According to Robbins (1996), House identified four leader behaviours that test the above-mentioned statements:

1) directive leadership communicates to employees what is expected of them, work is scheduled and specific guidance is provided for task accomplishment (similar to the Ohio studies dimension of providing structure) 2) supportive leadership displays friendliness and shows concern for the needs of subordinates (similar to the dimension of concern for people) 3) participative leaders consult with subordinates and use their suggestions and inputs before a decision is made 4) the achievement oriented leader sets challenging goals and expects from subordinates to perform at their optimum capacity.

Contrary to Fiedler’s model (which accepts that leadership style is fixed) as discussed in transactional and transformational leadership, Path-goal theory accepts that leaders are flexible and can display all of the above-mentioned four behaviours and adjust their style depending on the situation. The under mentioned figure explains Path-goal theory:
Robbins (1996) states path-goal theory proposes two sets of situational or contingency variables that moderate the leader behaviour-outcome relationship. The first refers to those factors in the environment that are outside the control of the subordinate namely task structure, the formal authority system and the work group within which the subordinate functions. The second set is associated with the characteristics of the subordinate namely locus of control, experience and perceived ability. Environmental factors determine the type of leader behaviour that is required as to maximize subordinate outcomes. Personal characteristics of the subordinate determine how the environment and leader behaviour are interpreted. Path-goal theory proposes that leader behaviour will be effective 1) when it is contrary to environmental factors for example participative leadership is redundant where conflict exist amongst a group requiring a directive leadership approach or 2) when it is incompatible with subordinate characteristic for example directive leadership will be counterproductive when a subordinates’ perceived ability is high (Robbins, 1996).

Path-goal theory has substantive implications for leaders who wish to care and grow subordinates. Displaying the applicable leader behaviour by taking cognizance of both environmental factors and characteristics of subordinates leads to increased
employee performance and satisfaction. Hence, the basis for sound relations are established which form the foundation for caring and growing employees. Caring and growing of subordinates can only commence when legitimacy of power has been achieved. Schuitema (2004), postulates that any relationship of power can only be achieved if the objective is to empower the subordinate. Empowerment of a subordinate is achieved firstly through a planned, systematic and incremental suspension of control exercised over the subordinate and secondly the increased suspension of control accompanies an increased degree of trust and entrustment of the subordinate. The process is supported through holding the subordinate increasingly accountable for what he or she is doing. Accountability is reached when self-interest is sacrificed for doing what is right. When this level is achieved control can be suspended.

Schuitema (2004) associates three processes with empowerment of a subordinate namely means, ability and accountability. In organisational context, means refer to resources, tools, authority, information, standards of achievement and supervisory time and attention to perform the task or job. Ability is provided through coaching and or teaching someone how a job or task should be performed and why (the rationale) it should be done.

If only the how part is taught it emphasizes the notion of people being used (exploited) to achieve the organisational objectives. The why part of performing in a specific way adds significance to the task in terms of the contribution it makes to the organisational performance. From a safety perspective the why aspect assists in creating an understanding how the ‘why’ aspect contributes to the safeguarding of the individual or fellow team members in order to develop a brothers’ keeper mentality. In other instances the rationale adds to improved efficiency for instance why a hole is drilled at a specific angle and length.

Meij (1980) proposes a method of instruction or coaching process to enhance employee ability:
In step one the process commences by setting the learner at ease, showing the task (if difficult in steps), explaining the why aspects (rationale) and testing understanding.

In step two the learner is set at ease, the learner tries and the instructor (supervisor) tests understanding. If the task is performed to the required standard the learner passes through the gate and if not, step three is introduced where the learner is taught with all the prerequisites in the previous steps. Step 4 completes the process when the learner practices until competence is reached.

This process is of value for instance in the underground working situation where super-visors are confronted with daily situations where support of the hanging wall is not installed properly or safety precautions are not exercised to standards.

Accountability completes the empowerment process. When clear standards of what is expected from a subordinate are in place, measuring compliance is facilitated. When standards are exceeded rewards can be introduced and when standards are met the superior can recognize this achievement. However when standards are not met, depending on the outcome of an investigation, censuring in the form of...
warnings can be introduced where carelessness has been proved. When deliberate violations of standards occur (malevolence), this must be punished through the appropriate codes of discipline. Correcting behaviour or dealing with disfunctionality is consequently enhanced (Schuitema, 2004) and the legitimacy of the leader is entrenched.

Maccoby (2004) argues that leadership is required to both change the organisation and to produce results. Leaders however need followers who, on the other hand, have their own motivations, which rise from powerful images and emotions in the subconscious, which are projected onto relationships and in organisational context on superiors, peers and subordinates. Maccoby (2004) calls these attributes transference and reports that numerous studies have indicated that positive transference result in improved productivity. During the care and growth process, leaders need to be aware of, as well as manage this phenomenon in subordinates.

Maccoby (2004) defines transference as the glue that binds people to a leader. Although transference facilitates followers of a leader, an inherent threat is also evident, since past experiences projected onto the present destroys objectivity which may be negative. Expressed in the organisation, negative transference may even lead to subordinates fighting and sabotaging their superiors.

Prentice (2004) argues that for followers to recognize their leader for what he really is, may be as difficult for the leader to understand them completely. Some of the worst problems with relations between leaders and subordinates originate from a misrepresentation of reality. The task of the leader is to define reality for the subordinate. When the subordinate understands reality, clear and decisive actions can be taken.

In organisational context, Maccoby (2004) distinguishes between three types of transferences. The first is called paternal transference and originates from a belief of subordinates that their superior knows best and they only need to obey and follow. The need of the subordinate is recognition and protection satisfying an infantile need to be loved and protected. The second type of transference is maternal and stems from mothers being perceived as not only authoritative but loving unconditionally by providing life and support but also discipline.
Experienced positively, employees can feel powerful support. The third transference type is called sibling transference. Examples are Cain and Abel and Jacob and Esau who competed for the approval of The Father and their father respectively. The present age requires people to think for themselves and draw their own conclusions, hence the increasing questioning of superiors and the absence of close ties with them. Maccoby (2004) also argues that the absence of fathers and mothers who both work result in children relying more on peers and brothers and sisters for support. A network of relations with peers develops, which result in less interest in mentoring and mentorship being displayed.

In managing transference Maccoby (2004) suggests that leaders first need to understand their own transferences through a process of introspection (bringing the unconscious to consciousness), which creates self- knowledge. This will be discussed in the section on new approaches to leadership.

**Conclusion**

Since it is not possible for leaders to completely control subconscious motivations and issues of transference of subordinates, the building of understanding personal differences, motivations and modes of learning of individuals, assists with managing a diverse work force. Establishing values that contribute to a belief system that people can relate to, ensures a culture of empowerment through providing employees with the means, ability and accountability. The legitimacy of the leadership that is created through this process lays the foundation for a developmental work relationship aimed at the care and growth of the individual, teams and the larger organisation.

Care and Growth leadership is values based and is associated with servant leadership. When the leader gives unconditionally, people become significant, which is the basis for their care and growth. The intent of leaders is also exposed in this process and trust develops between followers and leaders when the aim is the development of followers (subordinates). The development of followers result in their empowerment and this creates legitimacy for the leader to exercise power. This in return is a prerequisite for caring and growing subordinates. Giving and not receiving is the key.
2.2.1.1.6. Transactional and transformational leadership

2.2.1.1.6.1. Introduction

Behavioural theory of leadership evolved after trait theorists in the late 1940’s became aware of the limiting factors of trait theory (Robbins et al, 2003). Trait theory for example did not concern itself with the impact of situational factors on leadership. The behavioural theories of leadership dominated research up to the middle of the 1960’s and introduced for instance the concept of followership in leadership as well as addressing the situational factors in leadership in predicting leadership success. Where trait theorists researched the differences between leaders and non-leaders through personality, social, physical or intellectual traits, behavioural researchers of leadership postulated that specific behaviours differentiated leaders from non-leaders.

Transactional and transformational leadership should not be viewed as opposing styles of leadership but as complimentary to each other. Yukl (1994) is of the opinion that effective leaders know when to apply each suggesting that their application is dictated by circumstances. Robbins et al (2003) argue that transformational leadership is built on top of transactional leadership and create follower effort and commitment beyond what would result in a transactional approach.

2.2.1.1.6.2. Transactional leadership

Transactional leaders according to Robbins (1996) guide or motivate subordinates in the direction of established goals through clarifying roles and task requirements.

Both Burns and Bass (as reported by Yukl 1994) viewed transactional leadership as an exchange of rewards for compliance.

Yukl (1994) identifies three components of transactional leadership.

- Clarification of the work required to obtain rewards. The use of incentives to influence motivation is called contingent rewards
- Monitoring of subordinates and corrective action to ensure the work is performed effectively is called active management by exception
- The use of contingent punishments and other corrective action in response to obvious deviations from acceptable performance standards is called passive management by exception.

Transactional leadership according to Robbins et al (2003) originates from contingency theory of leadership, which evolved when the behaviourist approaches to the study of leadership realized that as situations changed, so the leadership style had to change and which the behavioural approaches did not recognize.

Robbins (1996) reports that the studies that had the most influence on the transactional approach to leadership were the behavioural theories of Ohio State University, Fiedler’s contingency model, path - goal theory and leader participation model (contingency theories). The Ohio research identified initiating structure (define and structure own leadership role as well as that of subordinates) and consideration (defined as relation-ships characterized by mutual trust, respect for the ideas of subordinates and regard for feelings) as the two primary independent dimensions of leader behaviour. Fiedler’s contingency model proposes that effective group performance depends on a proper match between the style of the leader when interacting with subordinates and the degree to which the situation gives control and influence to the leader. The least preferred co-worker questionnaire (LPC) measured a persons’ task or relationship orientation which reflected basic style. Fiedler now matched the leader to the situation and identified three contingency dimensions which Fiedler reasons define the key contingency situational factors that determine leadership effectiveness (Robbins, 1996).

These are 1) leader- member relations, which reflect the degree of confidence, trust and respect that subordinates have for their leader 2) task structure is the degree to which job assignments are structured or unstructured (procedurals) and 3) position power derived from the leaders position in the organisation for instance power to hire dismiss, discipline or promote subordinates. By mixing the three variables, Fiedler identified eight categories as reflected in the following figure:
According to Robbins et al (2003), Fiedler found that leaders performed better in situations that were very favourable to them and in situations that were unfavourable. In situations I, II, III, VII and VIII, task oriented leaders would perform better. Considering that Fiedler argued that the leaders’ style was fixed, the applicability of the model lies in matching leaders and situations. The LPC scores of a leader would determine the type of situation for which he or she is best suited by evaluating the three contingency factors. Leader effectiveness in the Fiedler model can only be improved in two ways by either changing the leader to fit the situation (when a group relation rates as unfavourable, replace the leader with one who is high task oriented) or change the situation to fit the leader (through restructuring tasks or increase or decrease leader power to hire or dismiss, promote or discipline subordinates).

Consider a leader who is in a category II situation. By improving position power, the leader would be operating in category I and the leader-situation match would be compatible with high group performance (Robbins, 1996).
Robbins et al (2004) report the Leader – Participation model developed by Vroom and Yetton relates leadership behaviour and participation to decision making. The theory provides a set of rules to determine the form and amount of participative decision- making as different situations dictate, recognizing that leadership behaviour has to adjust to reflect the task structure. Five alternative leadership styles namely Autocratic I and II, Consultative I and II and Group II is proposed. Originally seven contingencies were identified to match with leadership style but Vroom and Jago added five additional contingency variables (Robbins 1996). The benefit of the model is to assist the leader to choose the appropriate style in different situations.

Whereas the above theories focus on the leader, Hersey and Blanchard developed a leadership model called situational leadership theory. Situational leadership is a contingency theory but focuses on followers. Hersey and Blanchard argue that leadership is successful on selecting the appropriate leadership style, which is contingent on the followers’ readiness or maturity. Readiness is described as both being willing and able to perform a specific task. The rationale to focus on the follower originates from the belief that followers accept or reject a leader and it is the actions that followers portray that determine leadership effectiveness. The basic premise in situational leadership, reflect the leader- follower relationship. As the relationship matures, leadership style needs to be adjusted. Hersey and Blanchard apply the same two dimensions as in the Fiedler model namely task and relationship but in addition classify them as high or low and combine them into specific leader behaviours namely telling, selling, participating and delegating (Robbins, 1996).

Telling (high task- low relationship) occurs when the leader defines roles and tells employees what, how, when and where to perform a specific task. Selling (high task- high relationship) takes place when the leader exercises both directive and supportive behaviour. Participating (low task- high relationship) reflect shared decision making between the leader and follower where the leader adopts a facilitating and communicating role. Delegating (low task - low relationship) where the leader provides little direction and support (Robbins, 1996).

According to Robbins (1996), Hersey and Blanchard define four stages of follower readiness namely R1 where people are both unable and unwilling to take responsibility for a task. Followers lack competence and confidence. The R2
component reflects that followers are unable but willing to perform a task. They are motivated but lack competence. The R3 component reflects that people are able but unwilling to accomplish what the leader desires. They lack motivation. The R4 component reflects that people are both willing and able to perform a given task. The following figure explains the model proposed by Hersey and Blanchard:

Figure 2 – 11: Hersey and Blanchard’s situational leadership (Source: Stanz, 2005. Adapted from Robbins, 1996)

In stage R1 followers need clear and specific directions. A high task and high relationship is required at stage R2. High task solves the inability issue and high relationship behaviour obtains the buy-in of the followers. Stage R3 addresses the unwillingness of subordinates through a supportive, non-directive participatory style and in stage R4 the leader can delegate both power and authority to subordinates. Although situational leadership has been absorbed by many organisations, Robbins et al (2003), caution against endorsing the theory with too much optimism for
reasons that range from difficulty with the research methodology to ambiguities in the model.

2.2.1.1.6.3. Transformational leadership

According to Thorne et al (2000) the future in business lies in visionary, transformational leadership that can balance the opportunities created by rapid technological change and the demands imposed by the need to rely on highly skilled and more independent workers.

Yukl (1994) states that since the 1980’s, researchers became more interested in the way leaders transform and revitalise organisations and defines transformational leadership as to the process of building commitment to the objectives of the organisation and empowering followers to accomplish these objectives.

Burns (1978) defines leadership as a process and not a set of acts being a ‘stream of evolving interrelationships in which leaders are continuously evoking motivation and responses from followers and modifying their behaviour as they meet responsiveness or resistance, in a ceaseless process of flow and counter flow’. Transformational leadership can be viewed on the micro level as an influence process between individuals and on the macro level as a process of mobilizing power to change social systems and reform institutions. This involves shaping, expressing and mediating conflict among groups of people in addition to motivating people.

According to Yukl (1994), transformational leadership is primarily measured in terms of the effect on followers. The leader transforms and motivates followers by 1) making them more aware of the importance of task outcomes, 2) inducing followers to transcend their own self-interest for the sake of the team or organisation and 3) activating their higher-order needs (social, esteem and self-actualization needs as described by Maslow).

Yukl (1994) identifies four behaviours associated with transformational leaders namely 1) charisma as a process wherein a leader arouses strong emotions and identification with the leader, 2) intellectual stimulation as a process wherein a leader increases follower awareness of problems and influences followers to view problems
from a new perspective, 3) individualized consideration through providing support, encouragement and developmental experiences to followers and 4) inspiration to the extent a leader communicates an appealing vision, uses symbols to focus subordinate effort and models appropriate behaviour.

Transformational leadership is in essence the empowerment of followers to perform effectively by building their commitment to new values, developing their skills and confidence and institutionalising changes in the organisation.

Robbins et al (2003) argue that transactional and transformational leadership should not be viewed as opposing approaches to getting things done but transformational leadership produces levels of follower effort and performance that goes beyond transactional leadership.

Yukl (1994) reports that research on transformational leadership conducted was mostly descriptive and qualitative through conducting interviews. The interviews were analyzed to establish the processes that occur when leaders transform organisations, the behaviours that supported the transformation and the traits and skills that are characteristics of transformational leaders.

From a process point of view distinct phases were evident commencing with recognizing the need for change, managing the transition, creating a new vision and institutionalising the changes. Behaviours exercised in transformation were persuasiveness in change, diagnosing problems and help people to accept the change without letting them feel responsible for failure and build self-confidence and optimism to transform successfully.

Effective transformational leaders had attributes of being agents of change, risk taking, believing in people and sensitivity to needs, articulated core values which guided their behaviour, flexible and open to learning experiences, possessed cognitive skills, disciplined thinking and careful analyses of problems and were visionaries who trusted their intuition (Yukl, 1994).
Transformational and transactional leaders share a common trait in that both are charismatic. Bass (1990), Robbins (1996) and Schutte (2004) distinguish between transactional and transformational leaders, which are summarised as follows:

<table>
<thead>
<tr>
<th><strong>Transactional leaders</strong></th>
<th><strong>Transformational leaders</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Contingent reward</td>
<td>Charisma</td>
</tr>
<tr>
<td>Contracts exchange of rewards for effort, promises rewards for good performance and recognises accomplishments</td>
<td>Provides vision, instils pride, gains respect and trust</td>
</tr>
<tr>
<td>• Management by exception (active)</td>
<td>Inspiration</td>
</tr>
<tr>
<td>Watches and searches for deviations from standards, takes corrective action</td>
<td>Communicates high expectations, uses symbols to focus efforts.</td>
</tr>
<tr>
<td>• Management by exception (passive)</td>
<td>Intellectual stimulation. Promotes intelligence, rationality and careful problem solving.</td>
</tr>
<tr>
<td>Only intervenes when non compliance to standards</td>
<td>Individual consideration.</td>
</tr>
<tr>
<td>• Laissez-faire</td>
<td>Gives personal attention, treats each employee individually, coaches and advises.</td>
</tr>
<tr>
<td>Abdicates responsibilities and avoid making decisions</td>
<td>Inspires followers to transcend their own self-interest for the good of the organisation</td>
</tr>
<tr>
<td>• Guide or motivate followers in the direction of established goals by clarifying role and task requirements</td>
<td>Drives compliance</td>
</tr>
<tr>
<td>• Drives compliance</td>
<td>Drives values and thrusts of idealized behaviours</td>
</tr>
<tr>
<td>• Explicitly clarifies expectations</td>
<td>Balances emphasis on people and results (profits)</td>
</tr>
<tr>
<td>• Instructive/directive</td>
<td>Invest in developing relationships</td>
</tr>
<tr>
<td>• Facilitate subordinate actions</td>
<td>Establishes clear goals and objectives</td>
</tr>
<tr>
<td>• Monitor mistakes</td>
<td>Align employee goals with broader strategy</td>
</tr>
</tbody>
</table>
• Create risk avoiders Help employees to see the meaning of their work
• Create non innovators Unleash individual competence
• Create mediocre performers Liberal with praise and encouragement
• Express measured satisfaction Raise employee motivational maturity
• Attention on irregularities and mistakes Convince employees to strive for higher level of potential
• Keep track of mistakes Develop higher level of team trust

Organisations are changing constantly through internal and external influences. Leaders need both transactional and transformational attributes to ensure the achievement of organisational goals and objectives and adapt the organisation to meet changing demands. These required skills in leaders have to be developed and nurtured.

2.2.1.1.7. Contemporary studies in leadership

The study of leadership is a continuous process and new approaches and insights develops continuously. Definitions of leadership are also externalised for example the effect on followers (Robbins 1996), managing the work that other people do (Zaleznik, 2004) and expressed in vision, judgment and charisma (Cashman, 1998). Two aspects are evolving in recent studies on leadership:

Cashman (1998) introduces the concept of leadership as an inward-outward process and Goleman (2004) found direct ties between measurable business results and emotional intelligence, which is associated with leadership. Goleman (2004) evaluates the success factors of effective business leaders and calculates the ratio of technical skills, IQ and emotional intelligence. Emotional intelligence proves as much as two times more important than the other two.

Cashman (1998) reasons that leader success is measured to which extent the external environment has been mastered. In organisational context this relates to inter alia profits, cost savings and market share.
Leadership, according to Cashman (1998), is authentic self-expression that creates value and postulates that leadership from the inside out involves the awakening of the inner identity, purpose and vision so that one’s life thereafter is dedicated to a conscious, intentional manner of living. As the person grows, so does the leader, relating to a development or growth process. A focus on one’s purpose replaces the focus on external success.

Cashman (1998) proposes a seven step inter related process to master one’s life as a whole that assist in a more fulfilling and effective life. It is postulated as an inside – outside approach.

![Figure 2 – 12: Leadership from the inside out (Source: Cashman, 1998)](image)

**Step 1. Personal mastery**

Personal mastery is achieved through authentic self-expression. One has to understand oneself and this is achieved through questioning one’s belief system which creates reality. What one believes one becomes and Cashman (1998) also argues that as one believes, so one leads. A distinction is made between conscious and shadow beliefs. Conscious beliefs are explicit and known and relate to what one believes about oneself, other people, life and one’s work.

Shadow beliefs are more difficult to uncover and are cast when one avoids dealing with something. This inhibits personal transformation since one can only transform what one sees. Shadow beliefs need to be aired and addressed to limit their potential harm. Not dealing with shadow beliefs lead to addictive behaviours, difficulty in relationships, imbalanced lifestyles and ultimately health problems. In
order to gain personal mastery, shadow beliefs have to be transformed to conscious beliefs.

To leave our self-defeating behaviours behind we must use our conscious minds to undermine the destructive but unconscious beliefs that cause us to defeat ourselves

- Milton Cudney and Robert Hardy

Leaders either have a positive or negative impact in what they do. Cashman (1998) reasons that the more conscious the self-awareness, the more light the leader brings. Collingwood (2001) describes leadership as a personal quest, one that can produce blazing triumphs even as it plunges the leader into the darkest, most mysterious reaches of the self. Breakthrough leadership is personal but nothing can assist a leader who lacks self-knowledge.

The ideal is in thyself; the impediment to is in thyself

- Thomas Carlyle

Jung (2004) argues that from a leadership competence point of view, self-awareness is the most important since generating feedback from others might be difficult, (subordinates may fear vindication and others might want to save you the hurt). Feelings also impact on self-awareness. Book (2004) states the ability to know how you are feeling and why as well as the impact that your feelings have on your behaviour, become entrenched in the leader.

Goleman (2004) describes self-awareness as a persons’ understanding of his or her values and goals, and self-aware leaders are self-confident, thrive on constructive criticism and can assess their own and others’ capabilities. Self-regulation goes hand-in-hand with self-awareness. Since biological impulses drive emotions they have to be managed. Self-regulation is important in two ways namely people who are in control of themselves create an environment of trust and fairness. Leaders who have mastered their emotions are able to move with changes, which relate to competitiveness. Self-regulation also enhances integrity, which is both a personal virtue and an organisational strength.
An important component of emotional intelligence is isolated by Goffee (2004) namely situation sensing and refers to the ability to sniff out signals in the environment and figure out what is occurring without being told.

Cashman (1998) introduces the concepts of character and persona and reasons that character transforms but persona copes. Character is the essence of who one is and persona is created to cope with life circumstances. It is imperative to question where one’s leadership comes from and whether it is from character or persona. Character is the essence, the being of the leader and the purpose is to transform or open up to possibilities and potentialities. Persona on the other hand protects and helps with coping in circumstances. An over emphasis on persona results in insensitivity and can prevent new possibilities, learning experiences and potentialities.

**Step 2. Purpose mastery**

Purpose mastery refers to how the leader continuously discovers how to express his or her gifts to add enriching value to the world. According to Cashman (1998) purpose is discovered and is the broad context that integrates all life experiences into a meaningful whole.

*Some people die at the age of thirty- you just bury them at seventy*

- Danie Craven

Cashman (1998) is of the opinion that purpose is bigger and deeper than personal goals. It gives meaning and direction to all life and is the foundation that one's life is built on. Understanding what is important to oneself and what gives meaning to one’s life is the compass to finding one’s purpose. Finding ones’ purpose is not the end. Achieving ones’ purpose is. Motivation is the vehicle to achievement. Not for the sake of more money but for the sake of achievement alone. The achievement drive creates passion for work, seeking out creative challenges, displaying high energy levels to perform better, raising performance to new levels, keeping score and taking pride in work well performed.

**Step 3. Change mastery**
Cashman (1998), states that our lives are an endless flow of change. The ability to adapt to change contributes to one’s growth. Change is also very personal and points to new directions, new options and tests one’s potential. Boyatzis (2004) emphasizes that change requires a positive motivation. One has to want to change. Change driven by hopes and aspirations that is pursued out of desire will endure. Through mastering change one develops an inner confidence that one can learn from and handle anything. Coping with change not only improves one’s quality of life, but also enhances one’s effectiveness. Dealing with the present and not the past or the future will assist to focus one’s thinking and efforts. Purpose and values provide direction during times of change.

**Purpose is the most essential core of leadership. Without purpose there is no mission, vision, or reason for being**

- Tom Votel

Cashman (1998) proposes another key ingredient to deal with change effectively namely adaptability. Life is about growth and motion and being inflexible is the greatest threat to an effective life.

Since all change begins with self-change, the inside-out approach has profound implications. Change becomes an internal process of learning and development. There are only three ways to deal with change namely resistance, adaptation and learning. The latter two require resilience and Cashman (1998) postulates that resilience needs to be developed in order to thrive in change.

**Experience is not what happens to a man; it is what a man does with what happens to him**

- Aldous Huxley

**Step 4. Interpersonal mastery**

Cashman (1998) describes personal mastery as the blending of personal power with synergy power to create value and contribution. He reasons that leadership is self-expression that makes a difference, enriches the lives of others and operates in relationships, which are crucial for leaders to succeed. Creating value and
contribution simultaneously is the key to success. This is achieved by balancing personal power (authentic self-expression) with synergy power and contribution power (creating value).

In order to achieve this balance, the intention-perception gap needs to be eliminated (Cashman, 1998). Intention is from the inside of a person and perception is from the outside. A 720 degrees analysis is proposed. The first 360 degrees is from the inside (a deep, broad understanding of oneself) and the next 360 degrees evaluation is from the outside (colleagues, superiors and subordinates). By conducting a 720-degrees feedback, the leader integrates both the inner and outer context.

Cashman (1998) connects both personal and interpersonal mastery. As one grows as a person, one grows in the relationship and as one grows in relationships, one grows as a person.

When one is a stranger to oneself, then one is estranged from others too
- Anne Morrow Lindbergh

Goleman (2004) argues that where self-awareness, self-regulation and motivation impact on the self of a person, empathy and social skill impact on the relationship with others and play a critical role in interpersonal interactions. Through empathy the leader thoughtfully considers the feelings of others together with other factors when making decisions. Empathy is becoming increasingly important to facilitate teamwork and workforce diversity that is expanding due to globalization. The production teams in the mining industry in South – Africa are team based, diverse in nature and much is invested in developing both individuals and teams to produce efficiently. Social skill is based on the premise that nothing gets done alone. Moving people in the desired direction requires rapport through a social network and finding common ground with all kinds of people. It is fortunate that these attributes can be learnt and acquired through effort and commitment.

Step 5. Being mastery
Cashman (1998) postulates that being is one’s true nature, one’s core, one’s inner Self and the essence of one’s deepest level of character. Life evolves from the inside out and fears and anxieties are created from within. Exploring one’s being is an ongoing process and is the source of thought. In a cause and effect analogy being is ‘cause’ and thinking ‘effect’. To be alive, effective and fulfilled, a state of being is required.

Cashman (1998) proves that successful action is based on effective thinking but on days when one does not feel emotionally well, thoughts are less effective and actions less precise. Thus feeling is more fundamental than thinking and in a sequential process then feeling gives rise to thinking which results in action. These three concepts of feeling, thinking and action have one common denominator- they are forever changing and culminating into Being which underlies all areas of life. Being is not only experienced in activity but also in inactivity. Meditation, yoga and other methods not only relax the person but also assist in self-searching and creativity.

Cashman (1998) provides seven leadership benefits of being:
- Inner calm attracts others where thoughtful advice and counsel can be obtained
- Rapid change can be better dealt with since one is more calm and centred within
- The drive for external success is enhanced by awareness of deeper and more fundamental values which result in external success having more meaning and depth
- Tough, challenging problems can be solved more easily
- Profound rest of Being provides the ability to refresh oneself
- More balance in life is created which people sense and trust thoughtful calmness
- The sense of growing and becoming more uniquely and authentically oneself, enhance.
- To do more one first has to be more.

No amount of human having or human doing can make up for a deficit in human being
- John Adams
Step 6. Balance mastery

Cashman (1998) defines balance mastery as the dynamic centering of one’s life to build resilience and to enhance effectiveness and fulfilment. Since life is full of challenges from work to parenthood to keeping friends and family, balance is not a luxury for leaders but survival. Cashman (1998) reasons that mastery of balance means finding ways to connect with one’s center so one can deal with outside dynamics. Stewart (2004) supports the concept of balance and states that a leader experiences a problem when there is dissonance (disconnect, imbalance) between the inside and outside and stresses the importance of keeping both aligned.

Give me beauty in the inward soul; may the outward and inward man be at one

- Socrates

To see balance in action one only has to turn to nature where balance is expressed in two cycles namely activity and rest, which coincides with day and night. The four seasons also create a balanced cycle.

Balance is created by focusing on purpose where mind and body is in harmony (exercise), life’s damaging habits are dealt with, less seriousness, stress is managed effectively, nurturing close relationships, simplifying one’s life, taking real vacations (not just breaks) and integrating more reflection and introspection into one’s life.

The human body is the best picture of the human soul

- Ludwig Wittgenstein

Step 7. Action mastery

Cashman (1998) describes action mastery as an ongoing commitment to creating value through enhanced authenticity and self-awareness. Three core principles that underlie action mastery are distinguished 1) Being authentic through trust and truth 2) Self-expression relating to the future that is created through action and 3) Create value through broadening one’s interest by reconciling self-interest with common interest (Cashman 1998). In addition, Cashman (1998) describes two steps to action
mastery. The first step is to outline one’s growth commitments and secondly to build an awareness and act on growth commitments. This is achieved by firstly building awareness then changing the behaviour.

Goffee (2004) argues that authentic leadership begins with self-awareness or having a deep knowledge of oneself. Self-awareness is a capacity that can be expanded throughout life. It is also the understanding of one’s strengths and weaknesses, purpose in life, values and motivation as well as why a specific response is elicited in a given situation. It requires two processes namely introspection (reflective analysis) and the ability to internalise feedback from others. Kellerman (2004) reveals that leaders, as everyone else, have a dark side. Without self-awareness leaders and everyone else fail because they pretend not to have this dark side.

*The future is not something we enter; it is something we create*
- Leonard Sweet

An aspect that is interconnected in all seven steps above is emotional intelligence. Mayer (2004) defines emotional intelligence as the ability to accurately perceive your own and other’s emotions, to understand the signals that emotions send about relationships, and to manage your own and the emotions of others. Goleman (2000) offers four emotional intelligence capabilities in this regard:

<table>
<thead>
<tr>
<th>Self-Awareness</th>
<th>Self-Management</th>
<th>Social Awareness</th>
<th>Social Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Emotional self-awareness:</em> the ability to read and understand your emotions as well as recognise their impact on work performance, relationships, and the like.</td>
<td><em>Self-control:</em> the ability to keep disruptive emotions and impulses under control.</td>
<td><em>Empathy:</em> skill at sensing other people’s emotions, understanding their perspective, and taking an active interest in their concerns.</td>
<td><em>Visionary leadership:</em> the ability to take charge and inspire with a compelling vision.</td>
</tr>
<tr>
<td><em>Accurate self-assessment:</em> a realistic evaluation of your strengths and limitations.</td>
<td><em>Trustworthiness:</em> a consistent display of honesty and integrity.</td>
<td><em>Organisational awareness:</em> the ability to read the currents of organisational life, build decision networks, and navigate politics.</td>
<td><em>Influence:</em> the ability to wield a range of persuasive tactics.</td>
</tr>
<tr>
<td><em>Self-</em></td>
<td><em>Conscientiousness:</em> the ability to manage yourself and your responsibilities.</td>
<td></td>
<td><em>Developing others:</em> the propensity to bolster the abilities of others through feedback and guidance.</td>
</tr>
<tr>
<td></td>
<td><em>Adaptability:</em> skill at adjusting to changing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Service</em></td>
<td></td>
</tr>
</tbody>
</table>
confidence: a strong and positive sense of self-worth.

conditions and overcoming obstacles.

• Achievement orientation: the drive to meet an internal standard of excellence.

• Initiative: a readiness to seize opportunities

orientation: the ability to recognize and meet customers’ needs.

• Communication: skill at listening and at sending clear, convincing, and well-tuned messages.

• Change catalyst: proficiency in initiating new ideas and leading people in a new direction.

• Conflict management: the ability to de-escalate disagreements and orchestrate resolutions.

• Building bonds: proficiency at cultivating and maintaining a web of relationships.

• Teamwork and collaboration: competence at promoting cooperation and building teams.

**Figure 2 – 13: Emotional intelligence: Four capabilities (Adapted from Goleman, 2000)**

Goleman (2000) states that leadership styles follow from emotional intelligence and these styles impact on organisational climate.

Goleman (2000) report that six key factors influence organisational climate:

1) Flexibility or the freedom of employees to innovate unencumbered by red tape
2) Responsibility in terms of the individual towards the organisation
3) The level of standards that is set
4) Aptness of rewards and accuracy about performance feedback
5) Employee clarity about mission and values
6) Level of commitment to a common purpose.
Goleman (2000) goes beyond emotions and defines emotional intelligence as the ability to manage oneself and ones’ relationships. Goleman (2000) reports that, as a consequence of research, six leadership styles originate from the different components of emotional intelligence. These styles have a profound impact on the climate of an organisation and subsequent business results and are depicted in figure 2-14 below:

<table>
<thead>
<tr>
<th>The leaders modus operandi</th>
<th>Coercive</th>
<th>Authoritative</th>
<th>Affiliative</th>
<th>Democratic</th>
<th>Pacesetting</th>
<th>Coaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demands immediate compliance</td>
<td>Mobilizes people toward a vision</td>
<td>Creates harmony and builds emotional bonds</td>
<td>Forges consensus through participation</td>
<td>Sets high standards for performance</td>
<td>Develops people for the future</td>
<td></td>
</tr>
</tbody>
</table>

The style in a phrase
- "Do what I tell you"
- "Come with me"
- "People come first"
- "What do you think?"
- "Do as I do, now."
- "Try this."

Underlying emotional intelligence competencies
- Drive to achieve, initiative, self-control
- Self-confidence, empathy, change catalyst
- Empathy, building relationships, communication
- Collaboration, team leadership, communication
- Conscientiousness, drive to achieve, initiative
- Developing others, empathy, self-awareness

When the style works best
- In a crisis, to kick start a turnaround, or with problem employees
- When changes require a new vision, or when a clear direction is needed
- To heal rifts in a team or to motivate people during stressful circumstances
- To build buy-in or consensus, or to get input from valuable employees
- To get quick results from a highly motivated and competent team
- To help an employee improve performance or develop long-term strengths

Overall impact on climate
- Negative
- Most strongly positive
- Positive
- Positive
- Negative
- Positive

Figure 2 – 14: Six leadership styles (Adapted from Goleman, 2000)

Coercive leaders demand immediate compliance, authoritative leaders mobilize people towards a vision, affiliative leaders create emotional bonds and harmony, democratic leaders build consensus through participation, pacesetting leaders expect excellence and self-direction and coaching leaders develop people for the future.
Goleman (2000) reports both positive and negative correlations between leadership style and the factors influencing climate and proposes that the six styles of leadership be applied according to the demand of a particular business situation.

However, it is evident from the above table that not all styles are effective. Both coercive and pacesetting styles have a negative impact on climate. Considering coercive style of leadership, the ‘do as I say’ destroys flexibility (lack of new ideas) and responsibility, have a negative impact on rewards (extrinsic) and does not foster commitment.

The authoritative style has a positive effect on all the dimensions of climate.

Considering clarity, the leader shapes a vision and mobilizes commitment through clear standards and keeping employees responsible for achievement of goals, reward performance and promotes new ideas.

Goleman (2000) reports that from all the styles of leadership, coaching is used least. Since it is a powerful tool that, when applied, impacts on climate and performance, not only does personal development attract attention but business results improve as well. From a flexibility point of view, an employee feels free to experiment since the supervisor is in constant touch. Responsibility and clarity is enhanced since the employee knows exactly what is expected and how the job fits into the realization of vision and strategy. Employee commitment is created because the employee can realize that the coach (supervisor) is investing in the development of the employee.

Leaders need many styles and Goleman (2000) reasons that leaders who have mastered four or more (authoritative, affiliative, democratic and coaching) styles are able to create the best climate and invite high levels of performance. The imperative lies in understanding which emotional intelligence competencies underlie these leadership styles and which they are lacking to enable them to expand their repertoire.

Goleman, Boyatzis and Mckee (2001) argue that emotional intelligence improves business results. The mood of the leader plays a key role in this achievement. The assumption can thus be made that emotional intelligence is inward-outward
connected since leaders must manage not only their own emotions and that of others, but the organisation as well.

Goleman et al (2001) opine that the mood and behaviours of the leader drive the mood and behaviours of everyone else and creates a certain culture or work environment. However, as a balancing act the leader must, through reflective analysis, determine how his or her emotional leadership drive the mood and actions of the organisation and adjust behaviour accordingly. They also argue that most leaders care about their impact on the organisation. The difficulty is how and to what extent, since nobody will convey a negative impact (invasion of privacy), and trying to analyze themselves is impossible.

Goleman et al (2001) propose a five - step process towards mentally emotional intelligent behaviour:

- **Step 1: Imaging yourself**
  Through self-awareness, discover missing elements in emotional style and focus on who do you want to be

- **Step 2: Leadership style**
  How others perceive your leadership style through who you are (interpersonal mastery). The 360 - degree feedback focus both internally and externally- as discussed above.

- **Step 3: Tactical plan**
  Develop a tactical plan to bridge the gap between step one and two above.

- **Step 4: Internalize change**
  Internalize the change to make it last by practicing activities in the plan (personal, interpersonal, change, being, balance and action mastery)

- **Step 5: Create supporters**
  Create supporters who can help you to improve your emotional intelligence or change leadership style through a constant process of feedback and action.

Although Book (2004) states that intelligence quotient (IQ) is fixed at about ten years of age, emotional intelligence can be learnt, developed and improved over time. The danger however, is in overemphasizing one concept at the expense of another. Balance is required and Goffee (2004) warns against this imbalance. Extreme self-
awareness but lack of empathy may be perceived as being difficult to read. Successful self-management but lack of transparency may be perceived as being inauthentic.

Consideration has been given to the concept and improvement of emotional intelligence from an individual and leadership perspective. Druskat and Wolff (2001) however add a dimension to emotional leadership study in groups or team relations. Teams need to create emotionally intelligent norms through attitude and habit forming that supports the behaviours for building trust, group identity and group efficacy. Team emotional intelligence is more complicated than individual emotional intelligence since an additional dimension is added; that is the team is the sum of the emotions of its members and not only bears the members’ emotions in mind but also other groups and people not in their boundary. Awareness is not enough, regulating the emotions within is important.

Emotionally intelligent teams are aware of individual members’ emotions and regulate them. Team members also confront each other when norms are broken. Constant feedback from in- and - outside the group is solicited regularly to ensure high levels of self-awareness and teams are aware of the needs and concerns of people not in the team to enable them to develop relationships with those people. Through establishing norms for emotional awareness and regulation at all levels of interaction, teams can build trust, group identity and group efficacy needed for cooperation and collaboration, which are prerequisites for high performance (Druskat et al, 2001).

Contemporary studies in leadership focus on the leader as a person. Leadership is an inward-outward process and emotionally intelligent leaders have flexible leadership styles that enable them to adapt to various situations. Coaching as a style is a powerful tool for leaders for the development of subordinates. Through coaching the organisational climate and employee performance is improved resulting in enhanced commitment.

2.2.1.2. Customer Centred Strategy

Customer centred strategy is the second component of the world- class model.
Customer centred strategy refers to a vision and mission of an organisation to meet and exceed customer expectations and this, according to Swanepoel et al (1999), is primarily a leadership function.

Swanepoel et al (2003) state the importance of customer service to the external customer and emphasize the role that employees play in the delivery of high quality customer service. The entire business process must be aligned to empower employees to meet and exceed customer needs.

Prinsloo et al (1999) propose a process to align the needs and expectations of customers.

**Figure 2 – 15: Fundamentals of a customer centred strategy (Source: Prinsloo et al, 1999)**

In organisational context, customers are present, both externally and internally. The external customer can be referred to as where the product or service finds delivery and is the reason for the existence of the organisation.

Internal customers in the production process are the very next person or department involved in the production process. In the mining process the refinery of ore takes place after the ore has been produced. This takes place at a process plant and in the platinum industry where the various metals (platinum group metals) are separated hereafter another plant extracts the precious metals in raw format and passes it to a platinum refining plant to extract the platinum group metals. This is a classic
example of an internal customer chain where the next step in production requires ore at a specific grade, quantity and time to maximise plant capacity.

From an external perspective the Department of Minerals and Energy can be viewed as an external client, not only from an information and regulatory compliance point of view, but a specific relationship is cultivated as partners in the elimination of incidents and injuries through scheduled and unscheduled visits, incident investigations with the aim of improving safe working practices and standards and codes of practice improvement.

From an internal safety perspective, the safety department conducts monthly safety meetings chaired by a line manager. Safety performance information is shared, actions to problems elicited, monthly standards test administered on specific topics and information on Zero Tolerance ratings shared as well as remedial actions designed and agreed for implementation. During monthly planning meetings, safety officers are involved in layouts of work plans, new work methods to formulate specific codes of practice and standards. Monthly standards committees evaluate and review codes of practice and standards for work performed and employees re-trained.

Leonard and Rayport (1997) propose emphatic design as a set of techniques to arrest designers to develop various ways of meeting customer needs even if these needs are not articulated specifically. A five-step process is proposed:

- Observation is described in terms of what must be observed for example a locomotive or loader operating (with the operator) who shall do the observation and defining what behaviour must be observed.
- Capturing data not only refers to numerical data through time and motion studies but also through visually (videos and photos), auditory (recordings) and sensory (machines measuring vibration or seismic activity) cues.
- Reflection and analysis is a process where data gathered is shared with other colleagues who might observe things differently and cast other ideas to the possible problems and needs.
- Brainstorming solutions transform the observations into graphic, visual representations of possible solutions.
- Development of prototypes of possible solutions that clarify the concept of the new product or service, placing the concept in front of other colleagues for critique and stimulate reaction and discussion with customers

Emphatic design pushes the innovation beyond producing the same thing better. It is based on developing a deep, emphatic understanding of the unarticulated needs of the customer. The results are industry assumptions that are challenged and shifts in organisational strategy that occurs. Leonard et al (1997) identify eight aspects associated with customer service design:

- Vision, commitment and climate towards customer satisfaction pre – suppose a fundamental understanding of all employees in the customer service process to serve the customer.
- Customer needs and wants define a structured management process to collect information in a structured process from customers. These can be for example meetings, surveys, agreed size of work in defined contracts which stipulate product, service and delivery as per timeframes, quality and quantity.
- Continuous improvement of processes requires commitment on an ongoing basis aimed to increase competitiveness and unique product(s) or service(s).
- When platinum was initially refined, the metallurgical process took fourteen months to produce platinum from the production phase to the finished product. This period has been reduced to 6 months through improved metallurgical processes.
- Reaching out for customers means doing anything that is required to meet customer needs.
- Readiness to eliminate customer problems rely on continuous monitoring of customer complaints and prompt feedback on a regular basis regarding progress made through various problem - solving processes.
- Aligning with customers mean that the specific needs and expectations of customers are addressed.
- Quality assurance process places the responsibility on everyone to ensure agreed quality criteria of products or services are adhered to at all times. Rucci, Kirn and Quinn (1998) postulate that an increase in employee
attitude results in improved revenue growth. Rucci et al (1998) propose a measurement system be introduced to measure performance by means of total performance indicators. This needs to be linked to the selection, promotion and remuneration of managers who need to cultivate the performance culture within the organisation through identified leadership skills and performance evaluation.

The mining and process divisions function to ensure quality delivered ore is processed to specifications of delivery namely grade, time and quantity. From an organisational safety perspective, the safety officer on the mine and shafts have specific responsibilities assigned in terms of the Mineral and Petroleum Resources Development Act 28/2002, Sections 2(10)(1). From an internal perspective, the safety officer has the various production and engineering personnel as clients. This client relationship is defined in terms of responsibilities outlined by the Act above, as well as giving effect to company policy and strategy in conjunction with production personnel (clients), risk management and monitoring information regarding incidents, injuries advice or corrective action. This process is aimed at fostering relations and to ensure an understanding of mining operations, as well as eliciting ideas and advice on problem areas encountered. This includes geology, mining methods and standards, participation and agreeing on actions for implementation.

A relationship develops with the customer over time. This relationship according to Kumar (1996) is based on trust founded on power base, which, if abused, can backfire severely if the power relationship shifts due to for example change in markets or prices.

From an external safety perspective, suppliers are included in the design of specific equipment for specific conditions. The design of machines, locomotives and loaders has been changed to accommodate local conditions. Miners have been accorded with permanent ear protection where moulds are made of the ears of individuals and individual protection permanently customised. Inspectors from the Department of Mineral and Energy regularly conduct visits (planned and on invitation) to specific areas as part of a continuous involvement.
The benefits of trust between consumers (of goods or services) and suppliers, is openly sharing of information leading to a reciprocal investment in each other’s business. Another benefit from trust is treating the unequal partner fairly and ensuring justice. Kumar (1996) identifies two types of justice. Distributive justice is created when the pie is equally shared and procedural justice is created through policies and procedures that deal with vulnerable partners. This builds relationships. The building of relationships with the customer is based on an individual basis, not departmentally or organisationally. This relationship is open and flexible and people have to have real authority to deliver what is required.

Prokesch (1997) argues that distinctive relationships need to be formed with partners, suppliers and customers. In a production process an entity becomes both supplier and customer (supplier to next in line but customer from the preceding process). Customer centred strategy entails a specific vision towards customer satisfaction based on the needs of the internal or external customer. A specific strategy is developed after an analysis process of customer needs has been completed.

In the world-class company, Prinsloo et al (1999) state that strategy is the pattern of current planned objectives, deployment of resources and the interaction of an organisation with markets, competitors and other environmental factors. Building employees’ capacity to deliver on requirements, establish relationships based on trust result in reciprocal sharing of information to the benefit of all involved. When relationships are open and flexible and people have authority to deliver what is required, customer service is achieved. Core to the concept of strategy is strategic planning.

Christensen (1997) advocates strategic planning needs to become a core management competence and not a process that is outsourced. In developing strategy, two pitfalls need to be avoided. Strategy should not be a product of the biases, ignorance and compromises of the management team and once a strategy is embarked upon, the required resources need to be allocated to reflect the strategy.
Christensen (1997) proposes a three-stage process of redefining and implementing strategy:

**The first stage** is to identify the driving forces in the competitive environment. These forces are the root causes that need to be addressed. The top management team then generate ideas about the driving forces through brainstorming and ideas grouped together whilst duplication is eliminated. Mapping the driving forces, displays the root causes visually, for example cost and production on vertical and horizontal axis respectively. This displays trends without detail as well as clarifying assumptions with implications to ease reaching consensus.

**The second stage** is to formulate strategy that address driving forces through brainstorming the ranked driving forces and are specific and action orientated, then creating a strategy matrix representing the driving forces in one (horizontal) and the various departments on the other (vertically). This tells a story of each row and cohesion about the strategy. For each row and column a short strategy is then defined. The final step is to map the functional strategies and focus on what should be done, not how it should be done. This is achieved by following the same process as mapping driving forces explained above.

**The third stage** is to create a plan for the projects to implement the strategy. This includes resources of money and people required over a time period to affect the strategy. Project planning is a tool to assist. Through continuously applying the three stages, the management team becomes competent in strategic planning and takes responsibility and ownership for developing strategy that would guide the company. It stands to reason that this process of ownership for strategically managing the company cannot be required from consultants but needs to be established internally as a management competence.

Customer centred strategy has one focus and that is to meet and exceed the demand of the customer (Prinsloo et al, 1999). Customers are located both internally and externally in the organisation. Employees are to be empowered to serve the customer through building their capacity. Through emphatic design the unarticulated needs of the customers are accommodated in the customer design process. This assists in formulating and implementing a specific customer centred strategy in a
three staged process. Through continuously applying the three stages, management becomes competent to take responsibility and ownership of the customer centred strategy of the organisation.

- **Customer needs and wants**
  Prinsloo et al (1999) postulate from an external perspective the management of the organisation needs to implement a process where information is gathered from the customer and maintained in a structured manner. This includes all aspects from purchasing cycles to supply chain optimisation. The information gathered also acts as input into the strategic planning process. Internally the information gathered centres around the requirements set by the customers for products or services. This assists in design specification and the production flow optimisation.

  When information about the customer needs and wants are known, specific people in the organisation will use the information to collaborate with customers to provide them with what they want and in the world-class organisation, to meet and exceed these demands.

- **Vision, commitment and climate towards customer satisfaction**
  In the world-class organisation everyone understands the vision towards customer satisfaction and this is reflected in the way things are done in the organisation. Although Prinsloo et al (1999) associate this with climate; the way things are done in the organisation is also associated with organisational culture.

- **Quality assurance (QA) process**
  Prinsloo et al (1999) propose the implementation of a formal quality assurance process in the organisation. Every employee must accept responsibility for quality assurance in the line of duty. During design of the product, service quality must be built into the entire production flow process. When everyone in the organisation is trained and accepts responsibility for quality assurance, every employee is enabled to deal with the customer.

- **Aligning with customers**
Information obtained from the customer is used to design the product or service according to the specific customer demand. This results in products or services being specialised rather than being general or uniform. What distinguishes an organisation from another is frequently the specific product or service offered on demand, which may lead to a competitive market position.

- **Willingness to identify and eliminate customer problems**

  Prinsloo et al (1999) not only postulate that a measurement system be implemented to measure key result areas in the organisational strategy, but also a monitoring system for customer complaints. The analysis of complaints must be aimed at identifying problems associated with quality. Prinsloo et al (1999) advocate a formal feedback system to customers and employees with regards to performance.

- **Reaching out to customers**

  From an external perspective, management must implement systems and processes to make it easier for customers to do business with the organisation. Internally the principle is to make the job easier and all or specific departments must be able and strive to resolve customer complaints. Walking the extra mile for the customer must be embedded in the culture of doing business (Prinsloo et al, 1999).

- **Competence and empowerment**

  All employees must be trained in the various products or services of the organisation offered to customers. This understanding must be aimed at assisting the customer. Even down to the lowest employee all must be empowered to make judgement calls to eliminate problems that a customer experiences. This requires organisations to have powers of approval and specific decision-making levels available to all employees and ensure they are trained to exercise their authority (Prinsloo et al, 1999).

- **Continuous improvement of processes**

  All employees must understand the interaction of the various business processes with customers. Not only does this assist in solving customer problems, but processes, products and services can be improved on a continuous basis. This
assists in the quest to pursue perfection. When the fundamentals of a customer centred strategy are implemented, customer satisfaction is enhanced and the customer-supplier relationship is strengthened which is a pre-requisite for business in the long term (Prinsloo et al, 1999).

2.2.2 Delivery system
2.2.2.1 Organisational fabric

The organisational fabric consists of lean production, lean equipment management and lean engineering within the concepts of lean organisation, partnering and information architecture (Prinsloo et al, 1999).

According to Swanepoel et al (2003) the organisational fabric comprise of both systems and process components. The system components represent the various lean management concepts and the process is defined in terms of the various steps required for each concept.

The under mentioned figure explains the both the process and the steps.

![Figure 2 – 16: Management of the organisation fabric Source: (Prinsloo et al, 1999)](image-url)
2.2.2.1.1. Lean Organisation

A lean organisation has the goal of zero bureaucracy. Command and control style management is replaced by flatter team-based structures eliminating working in silos. This result is less functional management that reduces overhead costs. Lean organisations consist of lean production, lean equipment management and lean engineering.

Swanepoel et al (2003) states that the lean management concept has its origins in Japan where the focus was to eliminate waste. Waste is defined in terms of time, product, material and rework, which result in unnecessary high costs. Lean management offers a strategy in a situation where constant change is experienced and is dependent on a human approach that resides in the belief in the creativity of every employee to promote the well - being of all. Poppendieck (2002) postulates that the first step in lean thinking is to create an understanding of what value means and which activities and resources are absolutely required to create that value. Once this is understood, the rest is waste. This needs to be established at a fairly high level within the organisation.

The concept of lean thinking underpins the lean concepts and consists of five steps according to Womack and Jones (1996):

- **Define value from the perspective of the end customer**
  The value for each product and service for the end customer must be defined in terms of capabilities, cost and time of delivery along the process.

- **Identify the entire value stream for each product or product family and eliminate waste**
  Value is determined for every action required to produce the product(s); from the activities of defining the product, management information with regards to ordering, scheduling and delivery as well as the transformation of the product to the end requirement.

- **Make value creating steps flow**
  Each design, order and product must continuously flow from beginning to end with every step of the production process to eliminate waiting time,
downtime and waste. When value is pre-determined or specified, wasteful steps are eliminated and value-creating steps can be introduced for each product and/or service resulting in changes in work roles of workers.

- **Design and provide what the customer wants only when required by the customer.**

By designing and producing exactly what the customer wants when it is needed, over production is eliminated, resulting in less inventory and a ‘pull’ rather than ‘push’ effect is created.

- **Pursue perfection**

The perfection of the abovementioned steps follows when they are accurately implemented since everyone is involved from suppliers, subcontractors, producers, customers and employees. When all the role players are involved it creates the opportunity to find improved ways of value.

- **Lean production**

The goal for lean production is zero non-value adding work and includes various techniques for example time and motion studies and just in time processes which is aimed at streamlining production processes to produce exactly what the customer wants when it is needed. This included both goods and services. Poppendieck (2002) states that lean production also resembles a fundamental shift from mass to lean production, resulting in usage of less material, space, human effort, equipment, less stores inventory resulting in less capital and costs. Swanepoel et al (2003) reports that Womack et al (1996) defined two implications of lean productions:

- Lean production changes the way people work and they become more productive, obtain more responsibility and ensure costly mistakes are eliminated and

- Lean production changes professional careers in that the emphasis is not put on upward mobility, but also a lateral development and teamwork within a network organisation emphasizing the requirement of different skills. In organisational safety context, the feedback of past untrue information or incidents and injuries investigation results, leading and
lagging indicators changes in work standards and means as well as feedback from sister mines elsewhere in the organisation assist in a better quality service from the safety department to line management. The training of the supervisors to conduct investigations, safety audits and safety meetings not only empowers lower management, but also means less safety staff.

Poppendieck (2002) states two key features of a lean production process. It firstly transfers the maximum tasks and responsibilities to workers that actually create the value (first line) and secondly a system is in place to detect defects and once identified, traces it down to the root cause.

This presupposes that techniques and skills are vested at the appropriate levels in the organisation.

- **Lean equipment management.**
  The goal is zero failures and zero defects and is a total management approach that focuses on the efficient, accurate and easier ways of operating (production) and maintenance together with ensuring equipment and systems availability. Through effective supply chain management and engineering planned maintenance, lean equipment management is supported.

In an organisational safety context the maintenance and machine availability ratios of moving machinery, for example locomotives and winches, are reconciled with scheduled over inspections involving both safety and engineering departments. Downtime is also recorded with regards to unavailability of equipment to perform work (produce).

The company included in the study has a zero tolerance policy and strategy with regards to safety and production with a comprehensive risk management strategy comprising of risk assessments on jobs and machinery and risk ratings of working areas. Ratings are used to improve work and work areas. The company is also re-engineering the supply chain of equipment with suppliers to standardise. Research and development of new equipment for the various production outlets (mines) that use different mining engineering methods due to factors relating to depth, geological profiles and economic production of ore are ongoing. The mother company operates
11 mines with a total workforce of around 41000 people producing 3 million oz of platinum per annum. It is thus imperative to establish the correct supply chain for products and services when the organisation wishes to reduce costs taking the various mines into consideration from varying production methods and layouts to utilising cutting edge technology.

Various stock inventories for the same product result in redundant stock. The company included in the study assigned a specific project team to study the supply chain within the organisation. This gives effect to the lean thinking concept discussed above. Fisher (1997) asserts that the first step in designing a supply chain is to consider the nature and demand for the various products. This is where information architecture plays a role in terms of product variety, and the frequency of consuming or usage of materials.

Fisher (1997) offers a decision framework to assist managers in deriving the correct supply chain for their products.

<table>
<thead>
<tr>
<th>Efficient Supply Chain</th>
<th>Functional Products</th>
<th>Innovative Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Match</td>
<td>mismatch</td>
<td>mismatch</td>
</tr>
<tr>
<td>Responsive Supply Chain</td>
<td>mismatch</td>
<td>match</td>
</tr>
</tbody>
</table>

**Figure 2 – 17: Matching supply chains with products (Source: Fisher, 1997)**

The first step is to consider the nature of the demand for the various products. Products are classified in terms of functionality or innovation. Functional products satisfy basic needs, have a stable and predictable demand and long life cycles. This however inhibits competition, which affects price bargaining with suppliers.
Innovation has the potential to reduce costs but makes predictability uncertain. Fisher (1997) argues that innovative products require a different supply chain than stable functional products due to volatile demand. A supply chain performs two distinct functions namely:
- a physical function where completed products are supplied to a market and
- a market mediation function which ensures that the products reaching the marketplace are in fact what consumers want to buy.

Both functions however incur costs. Physical function refer to cost of production, transportation and inventory and market function costs relate to supply and demand (over or under) which result in financial losses due to reduced prices in oversupply and lost opportunities in under supply. From an organisational perspective the critical decisions to be made refer to inventory and capacity (usage not costs) and position inventory and usage.

Fischer (1997) postulates that suppliers are to be selected, not for low costs, but for speed of delivery and flexibility. The selected strategy must have specific goals and measures to track performance.

A matrix for decision-making is proposed where functional products and innovative products are measured against responsive or efficient supply chain. The decisions are enhanced when products are matched or mismatched against these aspects above.

Redundant stocks (waste) or lagging time constraints leading to production shortfalls and indicators of a malfunctioning supply chain. Aligning product and supply strategies create a competitive advantage that create growth and reduce costs. When aligned with a partnering strategy, a win-win situation is created for both supplier and consumer.

- **Lean Engineering.**

The goal is zero lost opportunity whereby senior management are involved with suppliers and customers to comply with customer satisfaction requirements when new products and or services are produced. Organisations in a highly competitive
product market as is the case with information technology, must continually innovate with new products and services to be commercially successful. This means continuously liaising with the customer to meet needs and requirements.

Establishing detailed engineering history of machines regarding machine availability, maintenance schedules, breakdowns and costs incurred on equipment is maintained and managed for eventual replacement and optimising life of product. Engineering departments’ planned maintenance programmes assist in achieving this objective and support lean equipment management.

The company included in the study has implemented the SAP3 information system with a specific module designed for planned maintenance utilising world-class information technology in becoming more cost efficient.

According to Morgan (2006), being lean means ‘speed to the market’ of products. This means product development on a continuous basis, which is aligned with emphatic design.

Morgan (2006) offers seven principles that enhances speed-to-market (lean) and assist optimising a product development and production system:

- A holistic approach to product development is to be followed where people, processes and technology are integrated, aligned and designed to be mutually supportive. Processes minimise waste and technology is solution focused and supports performance.
- Included is the customer first approach to product development, defined through understanding customer value as incorporated into product development, which meets both customer needs and efficient manufacturing.
- A frontloaded process where problem solving in cross-functional participation minimise downstream process problems when the product is manufactured.
- Continuous learning is built into the process through setting vigorous performance goals. Regular real time and post mortem events identify learning points through problem solving sessions.
• Synchronisation of processes for simultaneous implementation avoids standing or idle time.
• Standardising to create strategic flexibility, create predictable quality and timing outcomes.
• To the source, engineering means getting your hands dirty by staying in touch with the product.

From an organisational safety point of view analysing techniques to identify the root causes of safety issues need to be vested at the various levels; from cause and analysis to changes to risk assessment and problem solving techniques.

In conclusion, the lean production, lean engineering and lean equipment management are all underpinned by defining what value means, empowering the people that create the value (first line workers) to be responsive to customer needs, eliminate waste and optimise the creating value steps that flow. In a production environment lean means production flow is pulled from demand, -i.e. nothing is done unless and until a downstream process requires it to be done. Through emphatic design and applying the seven principles to speed-to-market, product development and production systems are optimised through integrating people, processes and technology provided the various levels are skilled to deal with the production issues and solve problems through a process of continuous learning.

### 2.2.2.1.2. Partnering

The goal is zero stakeholder dissatisfaction and includes relationships with various stakeholders based on co-operation and trust. Prokesch (1997) avers that an important aspect in any relationship is to understand what the partners envisage to get from it. This assists in transforming a contractual relationship into collaboration.

Prinsloo et al (1999) postulate that co-operation based relationships with stakeholders are founded on trust. Trust, according to Kumar (1996) has benefits and limitations. Trust creates goodwill that assists in preserving the relationship when one party perceives another to be exploitative.

Kumar (1996) argues that trust relationships are based on dependability and can only work if all parties play the trust game. He proposed five steps to create trust:
Step 1: Establish how the pie is shared (recreate distributive justice):
Step 2: Ensure fairness through procedural justice:
Step 3: Establish bilateral communication:
Step 4: Measuring performance and openly share information:
Step 5: Examine the relationship continuously.

Wickens (1999) advocates quality of the customer-client relationship in that suppliers must understand the needs of the customer. This would enable them to contribute to continuous improvements. The relationship is also strengthened when partners agree on common goals that build commitment and trust through mutual support.

In the instance of the institution under research, the company and the major explosive supplier in South Africa have partnered to develop new explosives technology to suit trackless mining and throw blasting where ore that is blasted is channelled during the blast into the gully (majority of ore), which makes the cleaning operation more efficient due to less manpower and time savings. Partnership sourcing is achieved when both parties realize the best commercial advantage (Wickens, 1999). Flexible and informed relationships assist in relationships to prosper and the contracts of reciprocal rights and obligations have minimum stipulations.

In organisational safety context the mine and Unions and Associations have entered into safety and health agreements with the aim to create partnerships to improve the health and safety of all employees. Health and Safety Committees comprising management and Unions meet monthly at the workplaces and organisational level. Health and Safety representatives who are in effect shop stewards are elected annually per working area. Unions and Associations are involved in all incident investigations and formal Inspector of Mines (Department of Minerals and Energy) inquiries.

2.2.2.1.3. Information Architecture

Every business depends on quality information to perform optimally. The human mind according to Robbins et al (2003) has a finite capacity to process data. When
this capacity is exceeded, information overload results with the resultant loss of information which impacts on the effectiveness of communication. Effective decisions optimising supply chain is based on quality information, from stock rotation (turnover) for raw materials to finished goods and speed of delivery in terms of orders. Information provides the tracking and monitoring mechanism. In the mining environment information on costs is critical for decision-making and optimising profits. Costs to produce a ton of ore and platinum ounce determine efficiency and profit.

*What gets measured gets managed*

- Manning 1998

Prinsloo et al (1999) state that the goal for information architecture is zero lost information. In order for management to meaningfully interact with employees to foster partnering, the key element is sharing of information. Information architecture needs to comply with two principles namely the availability of information into a framework that supports team-based operations and lean organisation principles and availability of information on a real time basis (Prinsloo et al, 1999). The mine included in the study has reduced the closing of month-end books from fourteen days to two days through the SAPR3 system. Activity-based costing is currently introduced where activity streams are cost and value-added determined.

In the context of designing an information system, information architecture entails analysis and design of data stored by the system, focusing on entities, their attributes and interrelationships. Data is modelled for an individual database, integrated within the systems of an organisation and linked with other sources of information. This requires architecture (design). The explosion of information technology the past twenty years (Toffler predicted in 1984) challenges organisations to make meaning of information through efficient processing of information.

Barker (2006) offers two main approaches in defining information architecture. The first is top-down where a broad understanding is developed of the business strategies and user needs before determining the high-level site structure and detailed relationships between content of the information. The second is bottom-up
which requires an understanding of the detailed relationships between content whilst creating process flow and indicating how the system could support user requirements.

Barker (2006) argues that both processes are required and not one at the cost of the other. When top-down is ignored, user needs may not be addressed and when bottom-up is ignored, users may not be able to explore related content. Barker (2006) proposes a nine-step process in creating effective information architecture.

- Step one is to understand the business contextual requirements and the proposed content for the system. This requires reading and analysing documentation, interviewing of stakeholders and conducting content inventories
- Step two requires conducting cards sorting exercises with a number of representative users
- Step three evaluates the output of the cards sorting exercises through grouping and labelling and establishing trends
- Step four involves drafting a concept information architecture with grouping of information and a hierarchy
- Step five requires the evaluation of the draft concept information architecture through applying the card-based classification evaluation technique (this will not be perfect initially and may require several attempts)
- Step six involves documenting the information architecture in a site map. This is not the final map and is finalised once the page layouts have been defined.
- Step seven tests the construct through storyboarding. A number of common user tasks are identified and page layouts are sketched to define how the user will walk
- Step eight involves other members of the project team through step seven for comments
- Step nine requires creation of detailed page layouts to support key user tasks
Information architecture is a process and a project that must meet project management criteria. Through designing effective information architecture, users are enabled to efficiently find content that strengthens the use of the system and eliminates frustration and time wasted searches for content.

Information architecture also fosters partnering with employees where information can be shared constructively. The organisational fabric is finally supported through the information architecture where lean production, lean engineering and lean equipment management interact to create efficient production of goods or services.

2.2.2.2. Joint Governance

2.2.2.2.1. Introduction.

In becoming world-class, organisations need to make a quantum leap from autocratic, multi-layered and steep structures to flatter and team based structures. Adversarial relations need to be replaced with partnerships and participation to foster engagement and commitment. Robbins et al (2003) state that whenever there is conflict between the prevailing culture in the external environment and the internal environment, the external culture would dominate. The democratisation of South African society makes it imperative to democratise the workplace as well.

Prinsloo et al (1999) reports that Purcell and Ahlstrand (1994) offer four generic strategy options for managing employment relations and advocate joint governance as the ultimate strategy option which promotes high collectivism through joint governance, partnerships and integrative bargaining as well as decision making that develops a high degree of trust relationships.

Figure 2 – 18 below offers four generic strategic options for the management of employment relations.
Unilateral employee maintenance and care:
- Pluralism / Unitarist Approach;
- Benevolent Autocracy

Joint Governance:
- Joint efforts to create caring Environment;
- Trade Union = valued partners in humanizing the workplace;
- Joint problem solving;
- Integrative bargaining and decision making;
- High degree of Trust

Aggressive control / Exploitation:
- McGregor theory "x" beliefs;
- Union avoidance / negative view of labour.

Formal trade union recognition and collective bargaining:
- Institutionalisation of conflict;
- Distributive collective bargaining;
- Specific Collective Agreements;
- Management prerogative
- Trade Union = guardians of workers;
- Limited sharing of information.

Figure 2 – 18: Four Generic Strategy options (Source Slabbert et al, 2003)

The rationale for this strategy option is the recognition that stakeholders (including unions) can positively contribute to the success of the organisation as well as the belief in every individual’s potential to add significant value to the enterprise when being afforded the opportunity. The success of the employment relation strategy lies in balancing the employment relationship between individuals and employees collectively and involving stakeholders in decisions that affect them. This is the basis for joint governance.

2.2.2.2. Participation

The post democratisation of the political system in South Africa saw the introduction of legislation to entrench industrial democracy as well. The introduction of the Labour Relations Act 66 of 1995 and the Mine Health and Safety Act 29 of 1996 are but two pieces of legislation entrenching worker participation as a means to enhance workplace democracy.
Specific worker rights are entrenched in legislation with regard to employment relations as well as health and safety in the workplace through legislated representation. Ultimately participation finds expression in joint governance in a company’s pursuit to become world class and can only succeed if management is committed thereto. Without participation, there can be no commitment of employees. Prinsloo et al (1999) define participation as the level of influence employees have on decisions that affect them.

Bendix (2001) states that worker participation entails 'the involvement of the employee in the organisation and planning of the work processes, as well as in the decision making function of various levels and in the management and policy making bodies of the undertaking. According to Zadek (2001) the new economies require organisations to be sustainable and legitimise the existence of the organisation. This is achieved through the creation of external and internal trust in management, which forms the basis of participation. Through participation as an employment relation strategy, the interests of workers are linked to organisational efforts to bring about social change that compliment sustainability.

Lund (2004) argues that policies need to be developed to participative sustainable development of the organisation through democratising the workplace where work is reorganised towards sustainable production. An incentive policy that is non-material and non-monetary needs to support the sustainable development based on safety, learning, competencies and influence. Nel and Slabbert (2003) also identify various levels of participation in the workplace through the levels of decision making which employees are allowed to undertake. Employees may be empowered to influence job-related issues but be limited to influence overall organisational policy decisions.

Bendix (2001) argues that the amount of influence that workers have is dependent on whether participation is task-centred or power-centred. Task-centred participation is job related whilst power-centred participation involves workers in managerial processes. Conditions exist for power sharing participation and are dependent on the preparedness of management to be influenced. Nel et al (2003) report that
companies who engaged in participative practices performed significantly better than those who did not.

Participation can also be direct or indirect in the decision making process. Direct participation means individuals or groups participate in decisions that relate to job performance and include team building, quality circles, mission directed work teams and financial participation through incentive schemes aimed at improving motivation, the satisfaction morale and organisational performance.

Indirect participation refers to representation on formal structures of negotiations or collaboration. This is an employment relations approach whereas direct participation is referred to as a human resource approach although it can be argued that both relate to employment relations since the foundation of involvement falls within employment relations and specifically the pluralistic approach.

Prinsloo et al (1999) argue that for participation to be effective, three interdependent interrelated elements in the decision-making process need to be addressed:

- Influence through participation, increase the joint or co-decision making process. Exxon Mobil (2004) argues that employer and contractor involvement in safety teams, conducting of safety surveys and contributions to incident investigations contribute to achieving safety goals
- Interaction refers to the problem solving activity of employers and employees with the aim to reach agreement or consensus on actions to be taken to achieve mutual objectives and
- Information sharing has to take place if both parties need to engage meaningfully.

Prinsloo et al (1999) argue that if any of these three elements are absent, meaningful participation is impossible. Participation has various levels depending on the intensity of the three processes. Participation also has the realisation of three following objectives in mind:

- Ethical;
- Socio-political
• Economic.
The ethical objective is aimed at personal growth of employees and humanising the work environment. The social objective is aimed at enhancing sound relations within the organisation, which affect society at large. The political aim is to extend the employees’ rights as civilians into the enterprise giving effect to the principle of democracy and the economic objective is to improve productivity and the achievement of organisational goals.

Prinsloo et al (1999) differentiate between management and participation performance governance. In management governance, management wields the power and exercises the prerogative to manage. Elitism is visible in the top ranks, which are guarded and protected. Rank and status is paramount and is visible throughout the organisation. Employees are treated as subordinate and seek refuge and protection in unions to equalise the power base. The relationship is at best adversarial and earmarked by mistrust throughout the hierarchy. Management relinquish responsibility to communicate directly with the workforce by communicating to representatives who do not inform the workforce. Communication is blocked at middle management level, leaving supervisors with the feeling that they have no impact on the mindset of workers. This in their view is the task of representatives. Disconnection to the organisation follows and teambuilding, participation, profit sharing and performance based pay remain a utopian dream (Prinsloo et al, 1999). As will be argued in section 2.2, this has dire implications for health and safety in the workplace.

In participative performance driven governance, results are the driving force, which is co-determined by employees and management. The supportive process is democratic management that fosters joint governance. Although diverse, employees and management are united in their effort and goals (Prinsloo et al, 1999). Employees that are participative co-determine and co-create with management and are committed. Trust develops as a result of feeling needed, resulting in buy-in and productivity.

In Australia, which is governed through a federal system, health and safety issues are decentralised to the different states. The United States of America recognises
the importance of workers’ and representatives’ roles in improving health and safety in the workplace through rights to participation, access to information and protection against retaliation through legislation. Interesting though is the absence of legislation to entrench participation through safety committees. This is left to a collective bargaining process according to US Department of Labour Occupational Safety and Health Administration (2006).

Prinsloo et al (1999) state that in Europe, worker representation differs in representation through Unions (United Kingdom and Nordic countries) and other forms of representation (France and Germany). In South Africa worker participation is entrenched through elected representatives to mine health and safety committees via the Mine Health and Safety Amendment Act 72 of 1997 chapter 3 (25(1) – (3), hereafter referred to as the Act.

Specific employer duties with regards to health and safety are also legislated in terms of Section 22 of the Act. Through the process of collective bargaining, agreements may be established. This, in a unionised environment results in safety representatives being shop stewards although the Act does not give preference to unions but makes provision for a non-unionised environment as well.

Pheffer and Sutton (2006) argue there are two types of employee participation. The first deals with communication of the principles and details of process safety to all affected employees. This forms part of occupational training and includes risk and hazard awareness. Participation in the second instance refers to employee involvement in hazard or risk analysis, incident investigations and the establishment of safety procedures. An example is the establishment of emergency reaction plans. The objective of first time participation is the foundation of all process safety activities and should according to Pheffer et al (2006) be aligned with all aspects of safety within the organisation. This supports the systems approach to safety.

Pheffer et al (2006) promotes three reasons for employee participation:

- Everyone has a need to be involved in the activities of the organisation and have their opinions heard. Involvement is the foundation for performance improvement
• People ‘on the face’ know best how work is performed and how areas for improvement are identified
• Employee participation acts as a reality check before new ideas, work processes or technology is introduced

The General, Mechanical and Civil Contractors Ltd (2006) encourage employee participation in safety matters to ensure a positive attitude towards their safety programme. This is achieved through pre-job safety meetings, where the job plan and safety is discussed as well as participation in safety committees is encouraged. The aim is to ensure the effectiveness of the safety programme and instil an interdependent safety culture where employees are encouraged to be aware of their own and fellow workers’ safety.

In the context of the organisation under study, Health and Safety committees are elected every two years per democratic election procedures. Health and Safety committees meet monthly at Safety Health and Environment meetings. All meetings are properly conducted and minutes taken according to normal meeting procedures. Safety representatives are elected per working area underground and form part of the Safety Health and Environmental structures that meet with management. Safety and Health issues are communicated via the representatives and proposals and issues elicited from the shop floor. Health and Safety representatives also play an important role in the abandoning of work areas due to perceived unsafe conditions. Behaviour Based Safety (BBS) coaches form a vital part of the Safety Health and Environment structures. BBS coaches work through the mine and engage people in safe behavioural practices.

According to Quoin (2006) the best safety practices include worker involvement and participation. The aim is to transfer ownership for own safe behaviour and the safety of other employees. This is achieved through employee involvement in safety measures of the job and stimulation of dialogue. Nel et al (2003) identify finance as another level of participation. Profit sharing, individual or a group bonus schemes and share option schemes are aimed to decentralise financial performance to lower levels. Stake holding is achieved where employees are given a stake in the business and actively share in the prosperity. Participation is thus not only a legislated process
to enhance workplace democracy, but should be a business rationale to engage people to foster organisational commitment.

Specific safety topics are addressed subsequent to the analysis of lagging indicators together with specific safety campaigns. Periodic re-testing on standards is conducted to operator level and workers are engaged in annual refresher training when returning from leave. These processes are designed to ensure knowledge that is essential for participation in Safety Health and Environment matters as well as enhancing individual awareness.

Participation fosters commitment and leaders in the organisation need to be equipped with the skills to elicit participation before a break in the hierarchical, autocratic management can be established. Democratising the workplace specifically where safety issues are concerned is a reasonable step in accommodating the legitimate expectations of the workforce. When employees are involved in ultimate power sharing, joint governance can be actively pursued in the quest for world-class status (Nel et al, 2003). The benefits are not just financial through improved performance and remaining competitive, but also society at large benefits through employees being valued as contributors and raising their standards of living through sharing in the success of the enterprise.

### 2.2.2.2.3. Team Based Operations

The globalisation and internationalisation of companies not only changed the concept of markets, economies and information technology, but also the way work is performed. Cutting edge technology like e-mail, internet and video conferencing even on mobile phones, have permanently removed borders of operation.

The rationale for teamwork originates in the philosophy that the sum of collective effort is more than the effort of one. Prinsloo et al (1999) argues that in a world-class organisation the emphasis is on ‘we’ and not ‘I’. Organisations become more team based since production is dependent on individuals performing various tasks working as a team to produce an end result. Bews (2003) opines that one of the global changes in the nature of work is a move away from relying on individuals to well co-ordinated teamwork. Teamwork is defined as ‘a small group of collectively
responsible and self-contained employees, who acknowledge their mutual accountability and share commitment to achieving a common goal through the complementary, yet diverse skills that each individual has to offer the group (Bews, 2003).

Sutherland, et al (2000) argue that teamwork skills must be transferred to individuals in a team since being reared as children and educated in schools and tertiary institutions, people are individualised for performance. Sutherland et al (2000) offer four skills to becoming a better team player:

- Foster mutual accountability that replaces focus on individual performance;
- Structure tasks in teams to achieve shared goals;
- Reward for co-operation and not competitiveness; and
- Move from independence to interdependence in team relations.

Organisations have four major benefits to move to teamwork according to Bews (2003):

- Teamwork suits the flatter organisational structures
- Learning in teams are better and teams react quicker
- Teams generate better solutions to complex problems
- Working in teams resulted in higher job satisfaction for some individuals.

Bews (2003) offers criteria to apply before one can actually refer to a group of people as constituting a team:

- Group size, configuration and commitment to a common purpose
- Team members must acknowledge that they are part of the team, have certain responsibilities towards the team and each other and are mutually accountable
- Individual skills are complementary in the team
- Team size, which is functionally determined.

The average stoping production team on a platinum mine consists of fourteen members.
Sutherland et al (2000) advocate interdependence as a behaviour approach to improved safety. Individuals in teams have reciprocal dependency and through group interactions, individuals recognise their contributions towards the group achieving goals, which enhances self-esteem and self-effectiveness. This results in enhanced personal commitment and a sense of belonging which act as a motivator in high performing teams.

In organisational context various types of teams can be distinguished. Bews (2003) distinguishes three types of teams:

- Parallel teams are teams that consist of members who have other duties in the organisation as well and function temporarily or permanently to solve specific problems besides their other normal responsibilities. Members have a dual reporting relationship to their normal line functionaries as well as to the leader of the team. In addition members may be a leader as part of their normal duties and an ordinary member in the parallel team or visa versa. Parallel teams are frequently crossed functional and consist of members with diverse knowledge and skill.

- Process teams are more permanent and rarely cross-functional. Since process teams are assigned to improve performance, members are from one functionary for example production or marketing. In highly sophisticated environments for example information technology, which require knowledge work, these teams are often self-managed and deal directly with customers and suppliers, determine own priorities, resources and performance.

- Project teams are time bound and usually have a competitive advantage as a goal. Members are full time for the duration of the project and excel as a result of the diversity of the team members.

In addition, Tompkins (1995) distinguishes five types of teams within a team-based organisation:

- Steering Team
- Leadership Team
- Communication Team
- Design Team and a
- Work Team
- **Steering Team**

The Steering Team consists of the Chief Executive Officer and the senior executives who basically have two tasks namely to steer the organisation towards a model of success and guide the team-based process through defining, guiding and motivating the leadership team.

- **Leadership Team**

The leadership team transforms the organisation towards a team-based organisation working towards the success model and accepts accountability for the performance of teams through encouraging, motivating and supporting the teams.

- **Communication Team**

Communication is the fuel that drives teams. Not only is top-down and bottom-up communication and information flow required, but also vertically across the organisation. The communication team must ensure the optimisation of the horizontal and vertical flow of information. This is ensured through various media (newsletters, briefing groups) and the process is monitored via surveys and individual follow up to ensure the communication reaches the intended target population.

- **Design Team**

The design team has one overall objective and that is to ensure peak-to-peak performance is designed into processes and performance.

- **Work Teams**

Work teams primarily ensure peak-to-peak performance. Cross-functional work teams address performance improvement issues through representatives of all departments involved whilst functional work teams comprise of representatives only from one area. The latter has the biggest impact on peak-to-peak performance whilst the former has the biggest impact in changing organisational culture.

Bews (2003) argues that the various teams discussed hardly ever function in their purist forms since time constraints and budgets may require flexibility from members,
which may result in a process team for instance to function on a part time basis. Bews (2003) proposes three factors to consider in designing teams for success:

The **first** is the organisational environment, especially purpose and communication channels of the team. Information availability on the aspects on which the team will concentrate their degree of competitiveness, success measures and reward must be designed into the team.

The **second** is individual attributes, which refer to specific skills that an individual brings to the team.

The **third** is compiling the team, ensuring certain requirements are in place to ensure the team functions optimally. These requirements provide direction and structure and assist the team to integrate within the organisation, which adds to motivation. When compiling the team, purpose, boundaries, structure and success measures need to be well defined.

The Teamwork Principles (1998) state genuine teamwork is values-based and behaviourally anchored in shared values. Leaders in organisations determine the culture through articulating and demonstrating the prevailing values through behaviour. These values are:

- No one looks good at the expense of others and rewarded for it. Team players are committed to the success of one another and the team
- Individuals in teams create interdependencies based on trust
- Mistakes for being wrong with individual contributions become more innovative when tolerated initially
- Team leaders must be equipped with the required skills to lead teams through facilitation, problem solving and conflict management and applied with intentional discipline
- Participation is fostered through sharing information based on respect for data, facts and objective analysis
- Complexity in solution finding is acknowledged and quick fixes eliminated
- Incremental improvements are encouraged which build confidence in teams
- Tolerance for work and ideas which are not complete especially where innovation is proposed
• Critical evaluation of group efforts without reprisal improves teamwork

When teams have clear, tangible goals that are measurable they can be effective especially when these are linked to the broader organisational goals.

Bews (2003) asserts that leadership is crucial in teams. Not only can a leader of one team be a member of another team and visa versa as previously stated, but depending on requirements and complexity, members may fluctuate between member and leader as well. This requires flexibility in leadership style application. A requirement of a leader is to foster team effectiveness by enabling performance through creating and maintaining five conditions. These are having a real team, specific direction, an enabling team structure, a supportive organisational environment and expert team coaching (Bews, 2003).

The mining environment operates totally with the team concept where stoping and development teams produce platinum bearing ore. When machines and technology (mining engineering methods) are also introduced, the socio-technical systems theory becomes applicable. According to the Wikipedia free Encyclopedia (2007a), socio-technical refers to the interrelatedness of both the social and technical aspects of an organisation and is founded on two principles:

The first is the interaction of social and technical factors that create the conditions for organisations to be successful. The second is that optimising one factor tends to increase the unpredictability and relationships that harm the performance of the system.

When the environment in which both these factors interact is introduced, a socio-technical system operates. According to The Wikipedia Free Encylopedia (2007a) socio-technical theory focuses specifically on internal supervision and leadership at group level through responsible autonomy vested in small groups or teams. In the mining environment small groups of ten to twelve people are responsible to prepare, drill, charge and blast a face (a panel of twenty eight meters). These tasks to complete a blast are not fragmented but interlinked which is best performed in the team concept. The whole and meaningful task - concept finds expression in a team
whose members are interdependent of one another to complete the whole task. This lends to greater autonomy and empowerment of teams towards goal achievement.

Yoon (2005) argues that effective teams have more open communication than ineffective teams whilst leaders in team-based organisations can function more as mentors and colleagues than boss. This challenges the skills of leaders to lead teams. Since compensation in the normal line of duty is individually based, the rewards for teams need specific attention to ensure effectiveness. Yoon (2005) established in a study that rewards based on team performance to attain goals recognised and reinforced performance especially when the whole group and not individuals within the group was rewarded. When performance is rewarded within the team for goal achievement, the motivational incentive for collective task achievement is embedded.

In conclusion as a result of the changing work environment and organisations functioning in flatter, team based structures, various teams designed with specific characteristics are operational in organisational context. Leading and compensating these teams for success and motivation towards goal achievement are challenging both the organisational hierarchy and the leaders to adapt to flexible styles.

2.2.2.4. Learning

Organisations are changing constantly. The information age, rapid changing technology (not just information but technical), new global markets and employee demographics require organisations to continuously position themselves strategically to meet challenges and opportunities. Organisations are developing to flatter, team based structures where knowledge work is demanded. Prinsloo et al (1999) argues that workers in flatter organisational structures know more than just their own jobs and are empowered to make decisions.

In his groundbreaking work on the learning organisation, Senge (1990) advocates that unless an organisation actively learns, it will perish. Senge (1990) proposes a systems thinking approach that focus on the internal environment - thinking from within. The causes of problems are part of the internal processes and are part of a single system. The solutions to problems lie in one’s relationship with the system.
Systems thinking concentrate on seeing things not as parts, but as a whole. Because of the complexity of organisations, life becomes overwhelmed with information, research and markets. This is assisted through fast change and increased interdependencies than actually can be managed. System thinking is the basis of how learning organisations think about the world. Senge (1990) promotes systems thinking as a mind shift through seeing interrelationships and not cause and effect, and seeing processes of change and not single events.

Don’t push growth; remove the factors limiting growth
- Management principle

Senge (1990) advocates that one has to know when to apply two feedback forces at work to stimulate learning. The first is a balancing process (stabilising) whenever there is goal-orientated behaviour required and secondly reinforcement is applied in situations of growth. The Pygmalion effect is a classical example of a self-fulfilling prophecy and the influence that behaviour has on self-image as a reinforcement of behaviour (Senge, 1990). No organisation learns unless the individuals within the organisation learn – not just obtaining more information, but also expanding the ability to produce the desired results. One obstacle to learning are mental models, which are deeply held internal images of how things work and limits one to tried and tested ways of thinking and acting. Mental models not only work in the conscious but also in the unconscious where assumptions on how people are perceived operate.

Argyris (1998) addresses a mental model about empowerment (which will be discussed under empowerment in joint governance) and argues that it is important to address one’s own and the team’s mental models to foster systems thinking. Two approaches to managing mental models are offered, namely:

- Openness to discuss views with others without prejudice and
- Merit where decisions are not consensus or own products but are based on what is in the best interest of the organisation.

On a personal and interpersonal level, two skills are proposed:
- Skills of reflection slows down one’s own thinking processes in order to raise the awareness of how one’s own mental models and how they influence one’s actions.
- Skills of inquiry are concerned with how one operates in face-to-face interactions with others, especially when dealing with complex and conflicting issues.

The challenge is to obtain balance between skill of inquiry and advocacy (most managers are skilled in advocacy – debate forcefully and influence others). However, the higher up in the organisation hierarchy, the more inquiry is required since one has to tap on the resources from others when dealing with complex issues. Winning an argument is not the goal but to find the best argument (Argyris 1998).

Since a mine functions through production teams, Senge (1990) argues not only is individual learning important, but also team learning and asserts that mastering the practises of dialogue and discussion (the two ways a team converse) facilitates team learning.

Since thought is to a greater extent collective, improvement should not concentrate on the individual level. Dialogue especially is required if free and creative exchange of complex and subtle issues are explored. This occurs through listening attentively and creating a fundamental understanding of one another through relinquishing own ideas. In contrast with dialogue is discussion where different views are presented and defended with the aim to find the best view to support required decisions.

Senge (1990) argues that our actions create our reality, which is an issue central to systems thinking making it prone to defensiveness. Teams may then avoid or resist probing problems systematically. Practise is required to develop team-learning skills. Supervisors as teachers require the skills to facilitate team learning and commute between dialogue and discussion, which are both needed in the team concept from a team learning point of view.

Senge (1990) advocates four conditions for dialogue to be effective namely:
• Seeing each other as colleagues with a mutual aim of developing deeper insights and clarity. This creates the ground rule for participation by all, especially in the wake of differences and how these are explored

• A facilitator for team dialogue, especially in the early stages to free individuals from personal assumptions and to keep dialogue momentum

• Balancing dialogue and discussion and applying each when required. When a new view of an issue is required, dialogue is the preferred option. When decisions need to be made, discussion is pursued where views are presented and defended. Team dialogue also has an added advantage when practised regularly since trust develops between team members through a deeper understanding of every members’ viewpoint

• Reflection, inquiry and dialogue.

Senge (1990) argues that reflection and inquiry skills are required to actively promote dialogue. Through reflection and inquiry the leader (manager) seeks consensus amongst team members by identifying common denominators in individual views and exposing a bigger picture than any individual point of view.

Reflection and inquiry skills thus lay the foundation for dialogue within teams but are skills that need to be acquired and, even more important, practised to sustain dialogue as a team discipline.

Senge (1990) argues that one aspect of a team in learning is visible conflict of ideas. Conflict becomes part of the ongoing dialogue within teams and arises from making ones’ views open to scrutiny and influence as well as the potential conflict between confusing mental models with actual reality. Defensiveness is inherent to conflict, but the way that defensiveness in teams is dealt with, distinguishes average from great teams. Defensiveness, according to Senge (1990) is a habit that is used to protect oneself from embarrassment and threat when one’s thinking is exposed. It also shields one from learning the validity of ones’ reasoning for fear that others may find an error in one’s reasoning.

Defensiveness finds expression in organisational politics and blocks energy to flow within a team. Leaders need to learn to deal with this defensiveness within teams to
avoid creating more defensiveness that blocks the free flow of dialogue. Defensiveness can easily be recognised when individuals fail to reflect on own assumptions, when no inquiry into each other’s thinking is done and when own thinking is not exposed to allow others to inquire into it (Senge, 1990). The consequence of defensive routines blocks energy and affects the spirit in people which affect morale. By seeking the truth both externally and within the team, reality is created for everyone. When this insight is reached, it not only unlocks the energy but builds shared meaning and understanding within the team (Senge, 1990).

It has been reasoned that leadership creates the direction in which the organisation moves. In a learning organisation leaders need to adjust and inspire people to achieve the vision.

Senge (1990) defines three primary leadership tasks namely:

- Designing not only policies and procedures, but systems in an integrated, holistic way where thinking and action is integrated
- Acting as steward of the vision underpinned by a strong sense of purpose and destiny and commit individuals to the work required
- Teaching or coaching people into systems thinking by helping people see the big picture through connecting their jobs and strategy, focusing on purpose by creating the rationale for the direction and existence of the organisation.

Leadership is developed through acquiring skills, conceptualising, communication and living values through behaviour, listening to and appreciating other ideas but one has to choose to actively pursue the creation of learning, individually and collectively (Senge, 1990).

In organisational safety context, learning about incidents and injuries are constantly fed back to teams and codes of practice and standards re-evaluated to ensure correct operating methods. Risk ratings and risk assessments are shared with team members to create understanding and accomplish objectives. Behaviour based safety coaches visit teams in a scheduled way to provide feedback on safe performance disseminated amongst teams after visits.
Zero tolerance ratings per team are compiled and shared with teams and action plans derived for addressing deviations.

2.2.2.2.5. Remuneration and Performance

Remuneration and performance form part of the elements of joint governance and according to Prinsloo et al (1999) a transformation to ‘world-class’ is impossible without a shift in remuneration.

Prinsloo et al (1999) argue that remuneration is a powerful driver of transformation within the organisation.

Figure 2 – 19: World-Class remuneration (Source: Prinsloo et al, 1999)

According to Prinsloo et al (1999), recognition is one of the most powerful motivators.

Armstrong and Murlis (1998) affirm that people need to know how well they perform (achieve objectives or perform work), and that their achievements are appreciated.

Two forms of recognition are distinguished namely praise and financial rewards. Praise should be related to real achievements and financial rewards should be given immediately after an event, which reinforces the reward process. Armstrong et al (1998) identify various other forms of recognition e.g. long service awards and work related travelling abroad which may form part of the total reward process. Recognition is also provided through promotion, job enrichment or status symbols.
and is effective when it is aligned with the performance management system or performance based pay.

Another powerful form of recognition is also provided by managers when the ideas of team members are listened to and acted upon which recognizes individual or team contributions. Tompkins (1995) also identifies individual goal assessment and emotional recognition with regards to recognition.

With regards to reward, Armstrong et al (1998) define reward management as the development, implementation, maintenance, communication and evaluation of reward processes. Processes refer to job evaluation, designing pay structures, performance management, performance based pay, skill pay, benefits e.g. pension, medical as well as managing reward procedures. Rewards according to Tompkins (1995) consist of base pay, pay for skill, individual bonus and goal sharing.

- **Base Pay**

  Armstrong et al (1998) define base pay as the rate for the job as affected by the internal and external employment markets. Base pay is used as a benchmark (externally) to add a value to similar jobs in the external market. Miller (2003) defines pay as the remuneration received and the degree this is perceived as equitable by a person compared to another person (job) within or outside the organisation.

  Armstrong et al (1998) define skills pay as linking pay to the level of skills used in the job. Two aspects are distinguished with regards to skills pay namely skills applied and skills acquired. The latter is sometimes used in a developmental mode but skills pay actually refers to skills applied.

  Armstrong et al (1998) identify eight reasons for skill-based pay:

  - It raises the skills base
  - The need for flexibility in fast changing technologies as well as competitive pressures force organisations to operate flexibly, e.g. multi skill tasks where skill-based pay support these systems and processes
• Increased pressure for efficiency and effectiveness due to competition require organisations to change the remuneration to support the achievement of objectives. Skill-based pay is seen to assist in delivering these aims

• The quest for commitment to the organisation force organisations to seek ways in achieving this aim. Skill-based pay offers employees the opportunity to enhance their skills, which develop their careers in the organisation making them more employable.

• In changing the organisational culture, skill-based pay can act as a reinforcement mechanism. Skill-based pay support organisations which value human development as well as grow, learn and develop the organisation

• Skills-based pay supports the creation of self-managed teams to reinforce empowerment for people to work more effectively with each other and apply the managerial and quality skills required

• The implementation of skill-based pay, originates from a belief that it is a fair base of rewarding employees for their contribution

• Other reasons for using skills-based pay is maintaining quality, raise employee motivation, assists in efficient labour use and increase pay competitiveness.

• **Individual Bonus**

Odendaal and Roodt (2003) state individual bonuses can be linked to individual performance as well as the achievement of organisational objectives. Individual bonus is linked to individual contribution in achieving individual, team or organisational objectives.

• **Goalsharing**

According to Burger and Erasmus (2003), goalsharing is a reward for individual and or group achievement of a shared goal(s).

Burger et al (2004) define various reward options namely:

• Fixed rewards include salary, benefits and company contributions.

• Variable rewards which are once-off payments (bonuses) and payments e.g. commissions.

• Incentive payments, which are based on pre-agreed payments for the achievement of specific targets (sales and production).
- Recognition, which are surprise (unexpected) non-monetary rewards that may be verbal or written. Examples are letters, certificates or a floating trophy.
- Monetary rewards in the form of money
- Non-monetary rewards can take various forms from verbal appreciation, formal letters to public or private ceremonies.
- Intrinsic rewards constitute the feelings within an individual that motivates from within to complete a task, because it is interesting, involving, exciting, challenging or personally satisfying.
- Extrinsic rewards refer to rewards expected from the organisation. A specific duty or task is performed for something in return, which is driven by having and not being.
- Individual rewards refer to the reward an individual receives for achieving a goal depending on individual contribution.
- Group or team rewards refer to rewards received for achieving a shared goal.

**Team pay**

Armstrong et al (1998) in addition however propose team pay as a reward mechanism as well. Subject to the organisational values, culture and management style together with the prevailing performance management system, team pay can be effective in rewarding team contribution. Armstrong et al (1998) however state a condition to effective team pay, namely that base pay must be firmly in place before team pay can be effective. Commitment is generated when employees can express views and have some control over these goals.

Sutherland et al (2000) postulate that feedback in itself, leads to higher levels of performance. It has been reasoned in the section in joint governance (participation) that participation is fostered through information sharing. Participation affects performance to the extent that commitment is generated (Sutherland et al 2000).

Rewarding performance is a reward principle supporting the principle of sustained performance according to Burger et al (2003). When performance has been defined, contracted, measured, analyzed and appraised, performance can be rewarded. The
appropriate reward structure can also contribute to reduction in costs through directly contributing to improved productivity. Burger et al (2003) argue that performance in organisational context function on two levels namely business performance and individual performance.

Business performance is measured with the balanced score card as developed by Kaplan and Norton (1992). Once the performance goals and measures for the business have been established, it becomes much easier to establish the individual performance contracts.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESSURE FOR CHANGE:</td>
<td>STRATEGY FOR CHANGE</td>
<td>REWARD</td>
<td>INTERMEDIATE OUTCOMES</td>
<td>DESIRED END RESULT</td>
</tr>
<tr>
<td>• Internal</td>
<td>• Focus areas</td>
<td>Driver of change</td>
<td>(lead indicators of performance)</td>
<td>• Profit (short)</td>
</tr>
<tr>
<td>• External</td>
<td>• Intermediate change</td>
<td></td>
<td></td>
<td>• Growth (medium)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Prosperity (long)</td>
</tr>
</tbody>
</table>

**Figure 2 – 20: Remuneration as transformation driver (Source: Prinsloo et al, 1998)**

In any organisational change process the systems need to adapt to complement the change(s).

Burger et al (2003) postulate that not only must the remuneration system change, but remuneration is also a catalyst for the change(s) to take effect and state four reasons why the reward system is critical when organisations need to change:

- Reward has an organisation impact since it is valued by everyone
- Any reward efforts draw the attention and commitment of management
- Change initiatives provide the ideal opportunity for organisations to correct reward imbalances and foster employee commitment and satisfaction
• Rewards assist to adapt individual behaviour in line with organisational direction.

Employees who are motivated and appropriately rewarded are paramount to organisational success. Robbins (2003) argues that reward should not drive a safety programme but people must be intrinsically motivated to work safely. The objective of rewards in safety must be to focus attention on goals and critical action and to introduce fun in the workplace.

2.2.2.6 Empowerment

The pre 1994 political dispensation in South Africa was one of centralised and autocratic government. The democratising of South African society thereafter as well as the decentralisation from central to regional to local (municipal) government paved the way for more autonomy in decision making and empowerment to the local electorate. This was however on the political level. Within organisations it has already been pointed out that legislation introduced was aimed at democratising the work environment. In South Africa organisational rights to trade unions, the introduction of workplace forums and health and safety legislation has one common objective and that is the empowerment of workers to share in decision making in matters of interest (collective bargaining and workplace safety matters to name a few). The State of California in the United States of America legislates worker empowerment whereas the Team Act in the United States of America legislates empowerment in non-unionised organisations to create forums of participation inter alia in safety issues and health management (US Department of Labor, 2006).

Argyris (1998) points out that, despite efforts from both management and workers, empowerment is struggling to embed in organisations. Management trusts the command and control models best and workers are ambivalent towards empowerment since it promotes personal accountability. According to Argyris (1998) empowerment is associated with transformation that is based on external and internal commitment, which is a two-tier process of generating human energy and activating the human mind. Tompkins (1995) defines empowerment as the leadership process of building, developing and increasing the power in organisations to perform through the synergistic evolution of teams.
Argyris (1998) associates internal commitment with participation, which is closely allied to empowerment. Internal commitment is encouraged and developed by management through involving employees in defining work objectives and specifying how to achieve them and setting stretched targets. This in itself can kill the empowerment process if management attempts to keep control through information systems and processes.

Empowerment is thus not a process through giving or installing but a process that leaders cultivate and grow (Prinsloo et al, 1999). It is a synergistic process of co-operation, sharing and working together through redistribution of power. Synergy refers to teamwork. Tompkins (1995) states that empowerment is related to teams and not individuals.

Contrary to Tompkins (1995), Schuitema (2004) argues that empowerment is very much individualistic as well. Through a process of providing means and ability (coaching and growing of people) accountability is vested. Accountability is about the incremental suspension of control (discussed in leadership and growth). Management had increased levels of worker control in safety matters through legislation promoting worker rights (Markey and Mylett, 2007).

Scannell (2000) associates empowerment in occupational safety context with employee responsibility and argues that for empowerment to be successful, responsibility for safety should be given to an employee. The responsibility must supersede those of supervisors and should be contained in a code of ethics. In the mining environment procedures for terminating work under unsafe conditions exist and are communicated to employees to enhance responsibility. Banks (2000) advocates that empowerment on the shop floor should be gained via the formation of unions. This would assist in combating employee abuse and assist in alleviating poverty. This in essence means a collective approach to empowerment through an employment relation strategy.

Davies (2003) proposes a three-factor approach to enhance empowerment. The first is to disseminate knowledge through education and training. The second factor is worker back-up and support through unions and management and thirdly
management and worker attitudes need to change in terms of prerogatives and taboo’s (management dictates and workers do) allowing for more worker inputs in safety matters. It is in the safety interest of both management and workers that prerogatives and taboos are addressed.

Argyris (1998) advises management to observe seven conditions when empowering employees namely:

- All organisations have top-down controls and inconsistencies in empowerment, which may occur that has and have to be managed. Employees need to be encouraged to bring this into the open before it stifles the empowerment process
- Avoid introducing contradictory programmes where internal commitment differs at the cost of external commitment.
- Empowerment has limitations that have to be understood from the start of the process.
- Internal and external commitment can co-exist. The crux is to identify which jobs require either or both.
- Working conditions must support and increase empowerment.
- Human resources policies need to encapsulate factors of morale, satisfaction and employee commitment, but is not the ultimate – performance is
- Employees need to be assisted when choices are made in terms of their commitment.

‘We cannot be a beacon to the world unless the talents of all the people shine through’
- Tony Blair

An organisation is empowered when people have the information required to make decisions, the motivation to make these decisions in the interest of all and when the authority to make decisions are vested at the appropriate levels within the organisation (Johnson and Redmond, 1998).

Empowerment is achieved through high levels of commitment, which is underpinned by honesty, openness and trustworthiness.

‘Empowerment involves a high level of commitment’
Belbin, Johnson and Redmond

When management is prepared to invest employees with more responsibility and the employees show a willingness to accept, progress is made through the five steps. Johnson et al (1998) propose an essential five-step process to empowerment. These steps are not chronological but can be at work simultaneously; however one step at a time is advised. These steps are also not just for teams or groups but for individuals as well and are:

Step 1: Informing;
Step 2: Consulting;
Step 3: Sharing;
Step 4: Delegating;
Step 5: Empowering.

STEP 1 – INFORMING.
Informing can take place individually and in groups. On the individual level, information about job content, work methods, rewards, training and key health and safety issues are provided. On group level, information about goals of outputs and methods, how work is allocated and how the group interacts with other groups are shared.

STEP 2 – CONSULTING:
Consulting can be conducted simultaneously with step 1, depending on both management and employee readiness. Step 1 is the telling part and, depending on maturity in both parties, progresses to consulting. The theory of situational leadership (Hersey and Blanchard) discussed in leadership and transformation is applicable in consulting.

STEP 3 – SHARING:
Where the interests of both parties are at stake in terms of the work issues mentioned above, joint decision-making is advisable. When interests differ, decisions are formulated through negotiations.

STEP 4 – DELEGATING:
Delegating can take place when employees are committed to organisational goals, are competent to make decisions and have the required information to make decisions.

STEP 5 – EMPOWERMENT:
The final step is empowerment and Schuitema (2004) defines empowerment as having the means, ability and accountability on individual or group (team) level to perform. Empowerment is the end product of a trust relationship that has been developed over a period of time culminating in decentralised responsibility. Management needs to act maturely and delegate power, authority and responsibility through an engagement and participative approach. The need to interfere with work performed needs to be contained if empowerment is to succeed.

At the heart of empowerment lies a credible relationship of trust, openness, care, honesty and integrity. This will be discussed in Chapter 2.3 within the theoretical discussion of the Safe Human Mindset Model.

Johnson et al (1998) advocate the empowerment process is sustained through aligning reward systems with the empowerment culture. This is achieved through both intrinsic and extrinsic rewards. Decisions about rewards are a joint decision-making process (how it is shared) and the package must be negotiated.

In an organisational safety context empowerment is ensured through health and safety legislation (for instance right to safe work and stopping unsafe work areas). In practice the conditions are negotiated.

In a world-class organisation, leadership must empower people as individuals through caring and growing as well as cultivating teams for the ultimate goal of empowerment which finds expression in individual and team performance. When both management and employees mature through commitment and trust, management provides the means, employees show ability (which management grows through development of people and teams), and employees can be held accountable for performance. Only then empowerment is achieved.

2.2.2.2.7 Values
Values and beliefs form the basic tenets of organisational culture.

Ivancevich and Matteson (1996) describe culture as what employees perceive and how these perceptions create a pattern of beliefs, values and expectations. Although organisational culture finds expression in the behaviour of employees, the study of organisations is not limited to culture but includes the view of systems and goals as concepts to study organisations as well.

Ivancevich et al (1996) refer to Schein’s (1985) definition of culture as “a pattern of basic assumptions – invented, discovered or developed by a given group as it learns to cope with the problems of external adaptation and internal integration – that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems”. Culture therefore consists of assumptions, adaptations, perceptions and learning components. Ivancevich et al (1996) assert that culture consists of three layers.

The first layer includes such aspects as artefacts and creations, which often are visible but not interpretable. This includes annual reports, open or closed doors, open plan offices and decorations that tell a story of the organisation. In layer two, values are conscious, effective desires or wants which are important to employees while the third layer contains the basic assumptions employees make that guide their behaviour. These assumptions influence employees in the way they perceive, think and feel about work, goals and performance of peers as well as general human relationships. The efficient operation of organisations is dependent on the extent to which shared values exist among employees.

Ivancevich et al (1996) state that values are the conscious, effective desires or wants of people that guide their behaviour. Values guide behaviour on and off the job. Depending on the importance of the values, behaviour is enabled and guided consistently across situations. But values do not only operate internally in organisations. External societal values impact on organisational values because work, recreation, family and society interact constantly.
Ivancevich et al (1996) provide Hofstede’s framework for the understanding of cross cultural values in organisational behaviour and offer a four dimension framework to assess cultures namely:

- **Power distance**, which refers to the acceptance of the unequal distribution of power in organisations. In a democratic society authoritarian and command – control management style will lead to tension and potential conflict.
- **Uncertainty avoidance**, which refers to feelings of threat by ambiguous situations.
- **Countries**, which are high in uncertainty avoidance, are closely guided by laws rules and procedures. Managers in these organisations also are low-risk takers and risk intolerant with less aggressive workers.
- **Individualism**, which refers to the tendency of people to fend for themselves and their families. Countries that value individualism, individual initiative and achievements, are highly valued and an independent relationship with the organisation develops. In collectivist countries society values harmony and individualistic cultures value personal autonomy and self-respect;
- **Masculinity values**, which are associated with assertiveness and materialism, whereas femininity values emphasise quality of life and concern for relationships. In countries with high masculinity, conflict between job and family and job stress is experienced which are less in femininity values.

According to Robbins et al (2003), values have both content and intensity attributes. The content attribute emphasise that a mode of conduct or end-state of existence is important. The intensity attribute states how important it is. The importance of values in organisational behaviour studies laid the foundation for understanding attitudes and motivation that influence perceptions whilst values influence both attitudes and behaviour.

Robbins et al (2003) distinguish between two types of values:

- **Terminal values** comprise desirable end-state of existence and refer to goals that an individual would like to achieve during his or her lifetime, e.g. family security, freedom and being financially independent.
Instrumental values comprise preferable modes of behaviour or means of achieving terminal values, e.g. honesty, responsibility and ambition.

*Each situation changes each situation*
- Johns Madden

Values also assist in problem solving. Adler and Kranowitz (2005) identify three types of problems with possible solutions. The solutions are achieved through problem solving processes and result in win-win outcomes for all parties involved. Distributive bargaining is competitive by nature and result in win-lose outcomes. This is not a preferred way of settling disputes where problems are experienced.

**Type 1 problems** are technical or convergent by nature. They can be technically bounded and, provided problem solving techniques are applied or experts involved, can be solved.

*People, things, unseen forces, sort of come together from time to time*
- Michael Connelly.

**Type 2 problems** are value or divergent in nature. Although agreement on the problem exists, agreement on solutions does not exist. Leadership strategies to solve type 2 problems need to address emotionally laden and value driven problems. A process is proposed whereby all stakeholders are represented in the problem solving process, clear mutual goals are established, different viewpoints recorded and debated, fears and risks listed, mutual questions derived and the pace of problem solving is managed. Premature negotiation is avoided creating an understanding that a prevailing set of values will apply whilst creating an understanding with everyone that trade-offs are involved in difficult choices. This process is required where values are at stake.

*Dance with your demons and they become angels*
- Anonymous

**Type 3 problems** are ‘wicked’ or ‘intractable’ because of complicated issues of multiple stakeholders, overlapping predictions, moral dimensions at play and sometimes influenced by nasty histories that show the issues. Topical
communication is indirect through lawyers, lawsuits and press releases. Deep, conflicting values prevail between parties. It is clear that solutions cannot be found through Type 1 and 2 processes.

Anstey (1999) proposes a transformation process to solve Type 3 problems.

The transformational approach to collective bargaining is vested in three bargaining approaches according to Anstey (1999). The first approach is integrative bargaining which in essence, is joint problem solving. The second approach is the design-idiom developed by De Bono and requires third party facilitation. The third is the approach advocated by Burton (in Anstey, 1999) to resolve deep-rooted conflict and also require third party facilitation. All three approaches have specific conditions and process steps but the outcomes are organisational transformation.

Blanchard and O’Connor (1997) argue that unless business leadership not only continuously demonstrates their commitment to profits but also to honesty, integrity, fairness, openness (trust) and co-operation (building relationships), economic survival will remain difficult. These are values that, when continuously lived, guide behaviour and create credible relationships which is a precondition for motivated employees. It is up to leadership to demonstrate and instil the organisational values in everyday behaviour (Blanchard et al, 1997).

Harmon (1998) distinguishes between three models of leadership namely:

- Survival driven leadership where the central driving force is to satisfy basic needs of those in the enterprise. Owners are paternalistic and care for others like patriarchs and see the organisation as extensions of themselves. Survival driven leadership is aimed at satisfying the basic physical needs and desires of people working in the organisation.
- The customer drives market driven leadership at a higher order.
- Values-driven leadership recognises the power of humans in the enterprise.

Values driven leadership at the highest level instils and provides values at every level in the organisation aligned with every activity and is applied in every aspect of the business, are ingrained in the core activities as well as every other aspect of the
enterprise. Values find expression in individual actions, which become complete and flow over into systems. The systems are reinforced due to the collective support of acts and structures that emanate to withstand turbulent times.

Blanchard et al (1997) define six steps to values-driven leadership.

Commit to values at the top
- Communicate values
- Educate for values
- Recognise performance on values
- Set standards for values
- Align structure and systems with values

Figure 2 – 21: Six steps to values-driven leadership (Source: Prinsloo et al, 1999)

Values in an organisational safety context will be discussed when the theoretical base of the measuring instrument to be applied is addressed in the section that follows.

Values find expression in the belief system of employees and Erickson (2006) argues that these stem from what is believed to be right or wrong or the preferred way of how one deals with the world. Values also find expression in the way one acts and behaves. Prinsloo et al (1999) also argue that values are the foundation of any employment relationship and support the systems that sustain the organisation.

Leadership is responsible to ensure that values are established and lived through the daily behaviour of all. The example which leaders display cannot be over-emphasized since employees conform to modelled behaviour.

2.2.2.2.8 Communication
Everything that occurs in organisational context evolves around communication. The management activities of planning, organising, leading and controlling have one common thread running through the processes – communication. The best plans, organised activities, leadership and control measures are meaning-less without effective communication, not only with those who have to exercise actions on decisions, but also through feedback as a bottom-up process to ensure effective two-way communication and the timely identification of issues of concern that need to be addressed which act as a reinforcement process.

Ivancevich et al (1996) states that communication holds organisations together. Communication is a process of creating understanding and Ivancevich et al (1996) reason that the communicator wishes to establish commonness with the receiver and define communicating as ‘the transition of information and understanding through the use of common symbols’ as well as the flow of information up and down, horizontal and diagonal (down and across) in the organisation.

Communication entails certain elements and flow in the process as mentioned above. This will be addressed together with the ways and means to improve communication in organisational context since South African organisations comprise of diverse cultures that also affect the communication process.

Ivancevich et al (1996) argue that it is not a question of whether communication takes place in organisational context, but the effectiveness of the communication and also state that every manager must be an effective communicator making it a process that occurs within people.

Robbins et al (2003) state four major functions of communication within a group or organisation:

- Member behaviour is controlled via the hierarchy (communication up and down);
- Motivation is provided through communication via role clarity and expectations of performance according to standards, which are communicated;
• Since work groups (teams) are social interactions, individuals express themselves emotionally through showing feelings of satisfaction or dissatisfaction and

• Communication provides the information required for effective decision making.

Communication contains certain elements that need to exist to ensure communication is effective. Ivancevich et al (1996) describe those elements of the communication process as a communicator or one who has ideas, intentions and information for the purpose of communicating something.

Through an encoding process the ideas of the communicator are translated into a set of symbols, which Ivancevich et al (1996) describe as expressing the communicator’s purpose. Encoding provides the format in which ideas and purpose is expressed. This can be verbal, non-verbal through figures, written material and/or signs.

The encoding process results in a message, which is the intended content that the receiver of the message receives. Messages take various formats and may be unintended as well. Silence on a particular issue also communicates a specific message which conveys that communication can be passive as well. The message needs to reach the receiver by way of a mechanism, which carries the message.

In modern day technology the spoken or written word is not just face-to-face between the communicator and the receiver, but various media are utilised to transmit the message. Telephone, faxes, e-mail, television, video - conferences, mobile phones, the internet, posters and pamphlets are utilised in modern organisations.

Once the message is transmitted, the receiver activates decoding mechanisms to provide relevance to the message. This decoding process is ingrained in the thought process of the receiver and involves interpretation of the received message. Ivancevich et al (1996) opine that the effectiveness of the communication is enhanced when the decoded message is as close as possible to the initial intent by the communicator.
The feedback process completes the communication process and acts as a loop for the communicator to determine whether the message was received and has elicited the intended response. This is not possible in one-way communication (top-down or bottom-up). Two-way communication provides for the feedback loop process to be implemented and may take various forms for example where it takes place and through asking questions, confirmation can be obtained if the intended message has been received as the communicator intended.

Ivancevich et al (1996) argue that organisations should be designed with the aim to provide for upward, downward, horizontal and diagonal communication.

Upward communication has the receiver at a higher level than the communicator and has four distinct functions, namely:

- Managers obtain vital feedback on certain organisational issues
- Serve as measure to determine the effectiveness of downward communication
- Sharing information releases tension
- Enhances participation and involvement from lower levels in the organisation and include suggestion schemes, grievances and appeal proceedings and group feedback meetings.

Downward communication refers to a process where communication flows from the higher level to a lower level in the organisation and takes place via briefs, feedback meetings, policies, procedures and memorandums. Formal publications are also examples of a top-down approach.

Horizontal communication finds expression in one departmental head communicating directly with another departmental head around issues of mutual concern. Where organisations function in rigid silo’s, communication normally takes place at department meetings whereas in a team approach the communication takes place horizontally and co-ordinate functions in the organisation. Highly decentralised decision making authority in organisations requires horizontal communication to solve problems on the lowest possible level.
Diagonal communication is used when members cannot communicate effectively through other channels where the safety department needs information from production and obtains this information directly without following normal chains of command routes. These save time and effort and depend on how mature the organisation is in terms of relationships as well as prevailing central or decentralised decision-making. Since communication is to a large extent face-to-face, Ivancevich et al (1996) stress the importance of interpersonal communication and explain the process via the Johari window depicted in figure 2-22 below.

The rationale is that many problems with interpersonal communications are associated with differences in perception as well as interpersonal styles. The way managers relate to issues is through information that they receive or transmit themselves and this depends on how they relate to themselves and others as senders of information.

![Johari Window Diagram](image-url)

*Figure 2 – 22: The Johari Window (Adapted from Ivancevich and Matteson, 1996)*
The basic premise is interpersonal style. One as well as others holds information that is not fully known or held by either party. The different combinations of knowing or not knowing by the self or others are displayed in the four quadrants.

The arena is displayed as the area most conducive to effective inter-personal communication. In the arena, the communicator and the receiver know all the information. Since a common understanding exists, communication is effective. The blind spot area refers to information that is available or known by others but not the self. This inhibits inter personal relationships and consequently communication suffers.

The facade resembles information that is known to the self and unknown to others. Information that is kept for the self due to possible interrelationship consequences or out of power or fear is associated with this façade. It is primarily a self - defence and like the blind spot harmful to effective interrelationships. The blind spot area manifests when relevant information is known by others but not the self, resulting in interpersonal relations and communication that suffer.

Feedback is used to reduce the blind spot and increase the arena when information is not known. Ivancevich et al (1996) argue that the day-to-day activities of the manager require effective interpersonal communications. The unknown area constitutes information that is unknown to the self and others. Exposure and feedback are two strategies to ensure effective interpersonal communication. Exposure is used by the self to increase the information of others through open and honest sharing of information but has risks in exposing oneself in the process.

The management process involves giving information (ensure understanding), commands and instructions as well as the use of influence and persuasion. The way in which this occurs determines effective performance. Since managers differ in their ability and willingness to utilise exposure and feedback, Ivancevich et al (1996) distinguish four styles in the application (or lack) of exposure and feedback.

**Type A managers** use neither exposure nor feedback. The unwillingness to enlarge own and others’ knowledge leads to perceptions of coldness or aloofness by others. Autocratic governance is displayed which is resembled with anxiety and hostility.
**Type B managers** – Some degree of relationships with others is desired but because of prevailing personalities and attitudes, type B managers are unable to open up and express feelings. Feedback is preferred before exposure. Distrust develops when managers hold back on own ideas. This inhibits free flow of information.

**Type C managers** use exposure at the expense of feedback and value own ideas and opinions but not others’. The blind spot increases. Subordinates have feelings of insecurity and maintain own importance and prestige.

**Type D Managers** use a balance of exposure and feedback. Managers that feel secure elicit ideas from others and expose own feelings. This enlarges the arena area described in the Johari window.

The effectiveness of interpersonal communication depends on management style, which is determined by the attitude towards exposure and feedback. According to Crafford (2003) cultural diversity is increasingly playing an important role in the communication process. As a result of globalisation and internationals, companies operate in diverse countries with varied cultures, values, norms of behaviour and differing perceptions.

In South Africa with its rich indigenous cultures, the shop floor becomes a micro cosmos of languages and cultures thrown together. In the absence of a common language and the added levels of illiteracy, communication in the mining industry becomes challenging. Fanakalo is a common mine language, which is based on instruction giving and does not foster effective two-way communication.

Diversity is thus an issue that receives constant attention, not only as a means of sensitising people to the phenomenon, but also in actively dealing with diversity from a supervisory perspective. Diversity sensitivity and management also enhances the changing of attitudes, which influence behaviour (Robbins et al 2003). With the shop floor displaying the composition of society, legitimacy is created which fosters organisational commitment.
Ivancevich et al (1996) warn against ethnocentrism, which regards one’s own values as superior to those of others, thus creating barriers to communication. On closer examination, barriers to communication can be classified as either internal or external.

Internal barriers refer to barriers within the individual and include selective listening, value judgment, frame of reference and source of credibility. External barriers refer to barriers outside the individual and fall in organisational context. Status differences, time pressures, in-group language, filtering and communication overload are relevant examples.

Ivancevich et al (1996) report nine barriers to effective communication:

- Individuals interpret the same communication differently depending on their frame of reference based on previous experience. Communication breaks down when the encoding process (the communicator’s purpose) and decoding process (relevance to the receiver) are not alike. This is aggravated due to the various levels in the organisation having different frames of reference with varying needs, motivations, attitudes and expectations. These factors influence perceptions of reality as well as conclusions and judgments.

- Selective listening occurs when new information that is received is in conflict with the receiver’s belief system and, right or wrong, result in a breakdown of communication. When for instance cost cutting is required and communicated, the expenses of executives’ salaries and travelling allowances paid may be in conflict with workers’ beliefs, resulting in their ignoring the cost cutting.

- The receiver when receiving information makes a value judgment. Two important aspects influence the value that is attached to a message namely the evaluation of the communicator or previous experience that the receiver has with the communicator and the anticipated meaning of the message received.

- Source credibility entails the trust, confidence and faith that the receiver has in the verbal and non-verbal actions of the communicator. The communications that subordinates receive from their manager is affected by their evaluation of
the manager and relates to value judgment, as mentioned above. In adversarial relations, where management and workers or their representatives are of opposing views of each other, real communication will suffer. When supervisors preach zero tolerance in safety issues but ignore or walk past unsafe acts and conditions, credibility will deteriorate.

- Filtering takes place in upward communications and refers to giving the ‘boss what he wants to hear’. Management acts on information received and filtering may occur when subordinates wish to influence upwards. This has implications for safety in the workplace where incidents, unsafe acts and conditions are required to be reported. Source credibility and value judgment may also play a role in filtering communication based on experience with the communicator and the trust that the receiver has in the communicator.

- In-group language refers to a common language that develops over time between members of a group. When outsiders do not understand the use and meaning of in-group language, communications may break down. In-group languages assist members of the group in identification and build self-esteem within the group.

- Status differences reflect in titles, rank, offices and furniture and are symbols expressing hierarchical rank as well as formal modes of address.

- Time pressures result in communication bypassing vital people in the process.

- Communication overload refers to the abundance of information that is available as a result of technology and the finite capacity of people to deal with this information. The abuse of e-mail is of importance since it has replaced the normal face-to-face communication to a degree where people in adjacent offices revert to electronic communication to each other. This has implications for relationship building and teamwork.

Crafford (2003) postulates that in the South African context, illiteracy also impacts on communication. The spoken language has been mentioned in the mining industry but the use of posters with inscriptions in safety campaigns need to bear the illiteracy of the workforce in mind. Another aspect that has current interest is equity and specifically women in mining (as per the Mining Charter requirements). This is influenced by gender perceptions (women talk, men don't listen), women would apologise (show empathy) which men perceive as a weakness (tough, hard and no
empathy) which actually expresses understanding and caring about the other person's feelings and is not apologetic (emotional intelligence). The use of politically correct language (especially in equity or gender issues) limits free flow communication since vocabulary is limited which reduces options in communicating (Crafford, 2003).

Like most things, communication can be improved, provided that it is worked at and practiced. Collins and Porras (1997) provide a set of rules that can assist in improving communication skills, both as encoder and decoder since one is always either communicator or receiver or both.

- Using multiple channels stimulate the senses of the receiver. By hearing (verbally), seeing (written) and repeating for example through videos, the message is reinforced.
- The communicator must tailor the message to audience needs since the receiver has different information needs as discussed above.
- Communicate with empathy means placing oneself in the receiver's shoes and be sensitive to needs, perceptions, attitudes and emotions.
- When dealing with change, face-to-face communication is preferred but awareness of body language is imperative.
- Apply active listening skills forces the communicator to pay attention, ask questions for clarity and creates mutual understanding. This assists with eliciting ideas from subordinates to improve conditions and keep them involved.
- Ensure that words and actions match. Practice what you preach. In safety context this means applying zero tolerance, stopping unsafe acts or conditions, apply the mini risk assessment steps of four steps to safety namely is this a dangerous situation, are there tools or equipment which are dangerous, are the people doing anything dangerous and what am I going to do about it right now as well as remaining at the site of the unsafe act or condition until it is rectified.
- The coaching techniques mentioned under leadership care and growth may also be applied in the process where applicable. This enhances relationship credibility and empowers subordinates to take responsibility.
The use of the grapevine can reinforce communication and assist in both upward and downward communication. Downward management messages can be reinforced and upwards feedback can be obtained on contentious issues.

The use of feedback is encouraged since effective communication is a two-way process, particularly in performance related issues. Feedback should focus on specific behaviour, be impersonal (focus on the issue not the person), be well timed in that a short as possible period must lapse from the occurrence of the issue to where feedback is provided and ensure the recipient has control and the desired behaviour when feedback is provided. This is established through eliciting ideas from the person as to what could be done to correct the situation and mutually agreed actions derived. This places the responsibility of the corrective action on the receiver.

In an organisational safety context communication is both downward and upward. Safety messages are issued formally via personal address or memorandums, whilst safety meetings conducted with elected representatives at regular intervals foster two-way communication. The problem arises when the representatives do not provide adequate feedback to workers and management relinquish their duty to communicate to worker representatives. This stifies involvement.

Horizontal communication occurs where the safety officer for instance communicates with line supervisors on a daily basis regarding safety issues.

Diagonal safety communication occurs continuously where safety officers share information and communicate with first line supervisors. Sharing of risk ratings, incident analysis reports, zero tolerance ratings and behaviour based safety results are all examples of information communicated diagonally in the organisational hierarchy.

Every production day commences with a safety meeting at the waiting places underground in the teams. Relevant topics are discussed, the activities for the day planned and incident information in other working areas discussed to enhance learning. Supervisors conduct early and late shifts to follow up on these procedures
and enhance face-to-face communication and visibility through addressing relevant topics and conveying specific messages or information.

Quarterly safety results are communicated to teams and teams that perform in production and safety to the required standards are rewarded at the meeting. Monthly Kgotha-Kgothe (downward) communication from the production manager to the total shaft workforce takes place where production results, safety issues and general issues or messages are conveyed to the total workforce.

Values do not directly impact individual behaviour but strongly influence attitudes. So understanding values leads to insight into obstacles that may influence behaviour. Managers must be acutely aware of employees’ attitudes because potential problems can be identified since attitudes influence behaviour.

From a safety point of view, managers must know that people that are required to engage in activities that are inconsistent to them, or are contrary to their attitudes, will be experiencing pressure to release dissonance. The pressure is lessened when employees perceive the dissonance to be externally imposed beyond personal control or the rewards are significant to offset the dissonance.

Communication binds the organisation together and everything in organisational context evolves around communication, being verbal or non verbal. Effective communication depends on the existence of key elements. Through encoding, a message is transmitted which is received and decoded. This process takes place upward, downward, horizontally and diagonally within the organisation.

Interpersonal style plays a vital role in communication and the Johari window assists in developing an interpersonal style that enhances effective communication.

Removing the barriers to effective communication and application of the rules for improving communication enhances interpersonal relationships, especially in the South African context of workplace diversity and the legacy of an illiterate workforce prevalent in the mining industry, impacting negatively on health and safety.

2.2.3. Business Results
2.2.3.1 Introduction

Business results form the third component of the 'world-class' organisation model. Prinsloo et al (1999) associate organisational business results firstly with improved costs, quality and speed of delivery as well as satisfied customers, employees and the community within which the organisation operates. These constitute Key Performance Drivers that support a culture of performance. The Key Financial Measurements identified with business results namely organisational competitiveness and profitability form the second component of improved business results.

2.2.3.2 Improved Costs, Quality and speed of delivery

Improved costs, quality and speed of delivery form the first set of key performance drivers in business results.

2.2.3.2.1 Improved Costs

Costs are one of the elements of organisational financial success. Different aspects of costs are also associated with the cost structure of an organisation depending on the nature of the business.

In the mining industry costs of production differs from a marketing organisation where costs of sales (advertising for instance) and costs of channels of distribution (costs of goods sold) are essential cost elements (Longenecker, Moore and Petty, 2003). Here cost per tonne of platinum ore or costs per platinum ounce produced are indicators of cost of production.

In the classical production process (input-> process -> output) costs are associated with inputs (costs of production). Chase and Aquilano (1992) associate two aspects with productivity namely input and output. Input relates to the resources required to obtain results (costs of people, material) and Outputs are desired results and is reflected in both efficiency and effectiveness. Effectiveness is reflected in output quantities and or quality. Efficiency is achieved when an output is obtained with a minimum of input.
Considering costs in manufacturing for example, efficiency is created by either increasing the output whilst the costs remain constant (cost per unit produced decreases) or both cost and output increase but the ratio of cost divided by output favours output Longenecker et al, 2003). Costs also form a critical factor in determining return on investment. Longenecker et al (2003) state that return on investment equals annual after tax profits per year divided by the average book value of the investment.

Longenecker, Moore and Petty (2003) identify four variables that determine net income that influences an organisation’s profitability.

- Amount (A) of sales equals the price (P) of the product times the number of units (U) sold
  \[ A = P \times U \]

The price of the product is inter alia determined by costs to produce a product.

- Cost of goods sold and operating expenses.
  Two types of expenses are associated namely fixed and variable expenses. Chase et al (1992) describe fixed costs as any expense that remains constant irrespective of the level of output. Examples are rent, property taxes, amortisation, insurances and salaries. Variable costs are expenses that fluctuate directly with the changes in the levels of output namely cost of material to produce.
- Interest expense is the interest paid on a loan.
- Taxes also affect net income depending on tax rates applicable to income.

Longenecker et al (2003) describe profits as:

\[ \text{Sales Revenue} \ (\text{Income generated through selling the product (minus) – Expenses (costs of goods sold, operating expenditure, financing costs i.e. interest expense)} = \text{Profit} \]

The total costs on a platinum mine are a critical factor in determining profit and investment. Since the platinum price is determined internationally, it is imperative to keep the costs and price variance as far apart as possible to maximise profit. (The gap between price for product and costs is actually gross profit).
This is different from an organisation (without oversimplifying the role that price plays in competitive markets) where an ice cream factory can offset to a large extent increases in costs in price of product. The platinum industry cannot do that. The war is about costs, but a weaker South African Rand contributes to increased revenue due to the rand vs. dollar exchange rate (platinum is paid in dollars and then exchanged into Rand). The analysts in the market however are aware of this and concentrate on the cost base of an organisation specialising in producing platinum to determine efficiency.

Another opportunity for a platinum mine to increase revenue is to produce more ounces of platinum with the same or limited increase in costs and actually use economy of scale to create more revenue. There are two aspects that can contribute to increased revenue namely decrease costs and or produce more with a relatively similar cost base. There is however one additional cost which is not associated with fixed or variable cost (expenditure and profit related).

Longenecker et al (2003) refer to this as cost of capital. The cost of capital is the internal rate of return that an organisation must earn on its investment in order to satisfy both its debt holders and its owners (in a public company listed on the security exchange these include shareholders). The measure for cost of capital according to Longenecker et al (2003) is based on the opportunity cost concept, which is basically the rate of return that could be earned by an owner on another investment with similar risk. If the rate of return meets or exceeds the expected return on the investment, the decision can be made to invest.

Another accounting process to decide to invest or not in a project or venture is return on investment. Longenecker et al (2003) describe return on investment (ROI) as equal to average annual after tax profits per year divided by the average book value of the investment. There is an inherent danger in relying just on this calculation to decide to invest or not. Longenecker et al (2003) identify two additional financial components that need to be considered namely actual cash flow received by the interested investor and time value of money.
The future investor according to Longenecker et al (2003) should be more interested in the future cash produced by the investment than reported profits (quicker cash with less risk). The future concept of money is related to the time value of money. The time value of money concept means cash is preferred sooner than later. In a developing country (South Africa), money depreciates by inflation, which is a factor to consider for investment purposes (value of money decreases over time).

Health and Safety in the organisational context is a cost that can contribute to increased profits. Occupational safety in the mining industry receives top priority. Besides health and safety being regulated through legislation, mines spend considerable amounts of money on risk management, safety programmes and insurances. Health and Safety in the organisation incur both direct and indirect costs.

The Construction and Safety Association of Ontario in Canada (2001) identify direct costs as medical expenses due to injury, compensation, salaries, payments, litigation costs and damage to equipment. Indirect costs are disrupted work schedules due to incident or injury, pain and suffering, declining production efficiency due to low morale following injury, replacement of labour, training costs, costs of investigation incidents and injuries and claims management.

In the South African mining context lost time injuries, incidents and serious injuries (reported to the Department of Mineral and Energy for investigation prescribed in the Act) are all investigated at a cost to the organisation.

An additional cost besides incidents, injuries and fatalities is ill health (HSE, 2005). Types of work related ill health in the mining industry is dermatitis, hearing loss, occupational related stress, back problems, loss of vision, tuberculosis and other illnesses associated with HIV and Aids.

These sicknesses contribute to absence from work and the mine included in the study adds an additional four percent to the labour plan over and above leave provisions to address the ill health issues. This is an additional direct cost to the normal operating expenses and excludes medical treatment costs. A measure to monitor the effectiveness of any health and safety programme is to offset the costs
of safety to indirect and direct health and safety costs in relations to operations expenses (HSE, 2005).

The Construction Safety Association of Ontario (2001) postulate that studies conducted indicate that investment in health and safety yield financial advantages through accident (injury) prevention and decreased incidents and injury rates that contribute to higher profits due to a reduction in the direct and indirect costs associated with incidents and injuries. A reduction in incidents and injuries result in a reduction in Workman's Compensation claims and insurances claims (the Mining Industry in South Africa use the Rand Mutual Insurance Company).

Wilson (2005) proposes five ways to reduce Workman's Compensation Claims and thereby improving organisational profitability:

- Make safety a priority through the implementation of a safety programme
- Take action when a claim occurs through investigation of the incident and drug tests. This may reduce claims
- Be aware of possible fraud (investigate incidents and past medical records)
- Take action behind the scenes, firstly to review the organisation’s Workman’s Compensation policy for accuracy purposes. Secondly the experience modification factors need to be evaluated. The premise is that every claim reflects an experience that affects the insurance rate. The lower the claims the lower the experience modification that should result in a lower insurance rate. Thirdly, explore any deductible expenses.
- Consideration must be given to outsource the functions referred to above. Outsourcing the insurance rates may be cheaper since the organisation becomes part of a larger purchasing entity with more bargaining power.

Health and Safety costs in the organisation need not to be a liability but, managed pro actively through the correct safety programmes, can reduce risks, incidents, injuries and the resultant decrease in costs can contribute towards a more profitable organisation.

2.2.3.2.2 Improved Quality
Quality means different things to different people depending in which industry one functions. It may be a product for example a car or service (banking or insurance) that is provided. It may also include both product (a car) and service (the dealer that sells and maintains the car).

Chase et al (1992) describe quality in terms of the perception of the customer as to what quality means. The customer defines quality in terms of the product or service required. Two aspects compliment quality of product and service. The first is design quality and refers to the inherent value of the product in the market and secondly conformance quality, which refers to the degree to which product or service design specifications are met (Chase et al, 1992).

The total quality management (TQM) approach to quality improvement originated after World War II through studies by Demming and Juran (Chase et al (1992). The basic premise is that since the organisation is a system, the total process control was the key to quality improvement and not the products emanating from the processes. This presupposed an inherent knowledge of processes and statistical processes control methods and the involvement and training of all people in the processes.

The total quality system is the foundation of total quality control

- A. V. Feigenbaum

Quality has a cost component side as well. Chase et al (1992) assigns rework, product scrapping, repeated service, inspections and tests (samples) to cost of quality. Hick (2006) advocates the measuring of cost of quality as a method of improvement and divides quality costs into failure costs (product or service), appraisal costs (inspections and testing activities) and preventative costs (costs of quality management programme, design reviews, failure analysis and trimming in quality). Quality at the source means that every employee performs the work of a quality inspector.

The Karsten manufacturing company (manufacturing Ping Golf Clubs) example, as reported by Longenecker et al (2003) is based on the quality philosophy of John Solheim (the owner) that quality is not the responsibility of the quality manager but
everyone in the organisation. This implies equipping people with the skills to perform quality management.

Continuous improvement drives the process of achieving product or service perfection (excellence). Poppendieck (2002) argues that the concept of leanness (manufacturing and programming) is inseparable of total quality management (the lean concept was discussed in the section on the World-Class Model – the organisational fabric).

Sutherland et al (2000) propose an organisational development process through a behavioural approach to improving quality. They argue that a quality and behaviour process is preferred to a safety improvement process since quality behaviour goes beyond just improving safety. A shop floor process through performance measurement, good selling and performance feedback is proposed.

The key is to continually improve quality performance. Sutherland et al (2000) propose the following advantages from a continuous quality improvement process:

- higher profit margins
- lower manufacturing costs (production costs)
- improved direct output
- on-time delivery
- larger market share
- reduced work, scrap, rework, cost of repairs
- increased ability to attract high-quality customers and
- improved quality of work life

Sutherland et al (2000) propose a seven-tier process to continuous improvement in a continuous process production environment:

- Open acknowledgement by all that Organisational Behaviour Modelling Approach to quality improvement is a process and not a project
- Deliver a clear and consistent message about quality
- Implement a quality opinion survey
- The quality improvement process is upward driven
Commitment to the quality improvement process

Employee participation through an internal customer model for quality improvement

Quality behaviour facilitated through quality improvement teams and link-pin structures.

Link - pin structures refer to maintaining individual links back to teams where these individuals are representatives in other teams and streaming groups. This maintains a continuation link throughout the process.

Longenecker et al (2003) define quality as 'the characteristics of a product or service that bears on its ability to satisfy stated and implied needs' (of the customer). Two aspects about the customer are important. The first is customer expectations about the product or service (type, time of delivery, product specifications) and customer feedback, which require listening and acting upon feedback. Chase et al (1992) postulate that total quality management is based on three main elements namely 1) the philosophical 2) generic tools and 3) tool of the quality control department.

The philosophical element consists of:

- Customer - driven quality and service is determined by the customer and quality is only compliant if the customer agrees
- Supplier - customer links refer to the fact that everyone in the organisation has customers. In the mining environment the process plant is the customer. The plant requires ore containing platinum at a given rate and at a specific grade (oz per ton). Quality on a platinum mine in terms of mining activities include holes that are drilled according to size, depth and angle for blasting purposes, the best cut reef is mined (the ratio between footwall and hanging wall and the ore that contains platinum bearing reef complies with a specified grams per ton content which was geologically pre-determined)
- Preventative-orientation, which entails the zero defect concept, which basically means doing the job right the first time. Zero- defect thus not only refers to a product or service, but the inherent process of performing a task or work as well.
- Generic tools (the second) element consists of process flow charts, check sheets, Pareto (20:80) analysis, cause and effect diagrams, run and scatter diagrams as well as control charts.

- Quality function deployment describes the variety of functions of the quality control function. This includes testing products for reliability (both laboratory and field testing), gathering product or service performance data in the field and resolving quality problems, planning and budgeting for the quality control programme, designing and monitoring quality control systems and inspections procedures and frequency. Quality function deployment also ensures the input from the customer into the design specifications of a product as well as using multifunction teams (synergy) e.g. manufacturing and marketing in the product design.

- Tools of the quality control department (the third element) is described by Chase et al (1992) as statistical control measures including sampling plans, process capability and Taguchi methods. Chase et al (1992) distinguish two aspects related to statistical quality control namely acceptance sampling and process control.

Acceptance sampling consists of testing a random sample of a batch of produced goods and, depending on the result, the batch (lot) produced is either accepted or rejected.

Process control involves testing a random sample of outputs from a process to establish whether the process is producing items within a pre-selected range. The production process is then adjusted according to the results. According to Chase et al (1992) quality control for both acceptance sampling and process control measures either attributes or variables.

Sampling by attribute for example refers to the testing of the engine of a car. The engine function is expressed in terms of functioning of capacity (for example at 2000 cc or 2 lit) and achieving the torque (say 180 Newton meters/NM) output, which is expressed in Newton meters. Sampling of variables means testing the capacity and torque to pre-set standards (for example 1995 cc – 2010 cc) and (178 N/M – 182 N/M).
Dennis (1997) postulates that quality is an approach as well as a way of being. This relates to a culture of quality (the way things are done) which can also be seen as a triad consisting of 1) Leadership 2) Measurement and 3) Participation.

All three aspects are in interaction with one another and the absence of leadership will result in for instance measurement not being integrated into decision-making. Leadership and participation that excludes measurement constitutes flying without navigating equipment. There is no direction and focus.

Dennis (1997) argues that quality as a way of being is about values. Values constitute the culture of the organisation and as will be discussed later, are at the heart of the corporate environment of any organisation. One lives one's values. The same applies to quality.

Sutherland et al (2000) describe quality as managing the organisation in such a way that it excels in all dimensions of products and services that is perceived to be important by the customer.

Besides the tools available to the quality control department mentioned above, a development in the previous decade namely Six Sigma is aimed specifically at organisations that do not want to make incremental improvements but major improvements (between 30% to 60%) in process improvement with a short time limit (4 - 6 months) with a significant bottom line impact (Six Sigma, 2000).

Six Sigma (2000) methodologies follow a two-tier approach. The first approach is the implementation of a measurement-based strategy that focuses on process improvement and the second approach focuses on variation reduction through the application of Six Sigma driven projects.

Two Six Sigma sub methodologies support the two-tier approach. Six Sigma process (define, measure, analyse, improve and control) is an improvement system for existing processes that fall below specifications and the result is incremental improvement. The Six Sigma improvement system process (define, measure, analyse, design and verify) is applied to develop new processes or products and can
be applied when existing processes require more than just incremental improvements.

According to Hoerl and Snee (2004) Six Sigma consists of three aspects. The first is the deployment of a management initiative, the second is improvement projects and the third aspect is a set of methods and tools.

- **Management initiative** comprises of breakthrough improvement focused on business improvement. Once the initial improvements have been affected the structures and infrastructure must be applied to grow and sustain gains.

Since Six Sigma is a systematic and focused approach comprising of road maps and step-by-step procedures that require from all involved (champions and process leaders) to adapt to the discipline required by Six Sigma, the right people to fill key roles are paramount in the process.

The process needs to be supported by firstly a communication strategy to keep all affected informed about progress and secondly a recognition and reward plan to support any initiative.

Any Six Sigma initiative needs to be reviewed by management to ensure success. This includes progress reviews to ensure milestones are achieved and that corrective measures are applied (especially senior management).

- **Improvement projects**
  
  It is imperative to focus on the right projects that will assist in achieving a business strategy.

Since Six Sigma is linked to the business goals of the organisation, the selection of the right projects with greatest leverage that will impact on the bottom line and realisation of the business strategy renders it essential for senior management to be involved. Co-ordination of planning activities that impact on various departments and levels require senior management control. The selection and implementation of projects require project management
skills. The control over Six Sigma projects requires quarterly, six monthly and annual reviews. This is at senior management level.

Sustaining the gains (six sigma control plan) takes place at both tactical and strategic level. At tactical level the gains of individual projects are sustained and at strategic level the overall gains for the organisation from the Six Sigma initiatives are sustained.

According to Hoerl et al (2004) Six Sigma is aimed at obtaining the right results through improvements in process performance that affect the bottom line. After a project initiative, the calculations have to be made to evaluate financial savings. A project reporting and tracking system is required to monitor progress of an initiative, control the achievement of milestones and ensure the provision of a corporate memory.

### Six Sigma Methods and Tools

The third and final aspect of Six Sigma according to Hoerl et al (2004) consists of seven methods and tools that can be applied in the Six Sigma process.

- The first method is process thinking and originates from the view that all work is a process that can be studied and improved. Work consist of a series of steps which are interconnected and the classical input -> process -> output sequence that relate to production and work forms the departure point for process thinking.

In a mining operation inputs relate to material, people and machines that need to be applied or be available to ensure production (process) which consists of basically three cycles. The first is making a work area safe by installing support then drilling holes that are filled with explosives (charging up) and then the second cycle of blasting occurs. The third and final cycle is cleaning of the blasted panels where the blasted ore is extracted (output).
Whether it is internal or external customers, a consistent product or service is required and Hoerl et al (2004) argue when problems are viewed from a framework of a process with inputs, processes and outputs, a common approach to improving processes and solving problems can be applied. Variation is present in all processes and every aspect of work. Unintended variation reduced process performance, decreased customer satisfaction and negatively impacted the bottom line results. Just in time delivery of products or services, which functioned as required (to specifications) also contributed to consistency.

Hoerl et al (2004) state Six Sigma reduced process variation in two ways. The first is shifting the process average to the desired target level and secondly reducing the variation around the process average. This results in a process that performs at the required average level with minimal variance between products.

- The second application of Six Sigma is facts figures and data, which assist data - based decision making, vis- à- vis gut feel and intuitive decisions.
- Thirdly, the improvement methodology for system improvement of define, measure, analyse, improve and control has been discussed.
- In the fourth instance Six Sigma utilises eight key tools namely process mapping, cause-and-effect matrix, measurement system analysis, capability studies, failure modes and effects analyses, multi-vari studies, experimental design and control plans.
- Fifthly the application of various statistical tools.
- In the sixth instance the application of user- friendly software.
- Lastly, the focus on critical few variables (inputs and process). The crux is identifying the critical input variables that drive the critical output variables.

The objective is to be proactive by measuring and adjusting process inputs to control the process and achieve the desired performance. Hoerl et al (2004) postulate that Six Sigma has an impact beyond the factory floor where up to forty percent of opportunity for improvement in sales reside (for example e-commerce, information
technology, through consumer credit and inventory management with suppliers discussed in lean manufacturing).

Six Sigma can also be utilised as a leadership development tool according to Hoerl et al (2004). Leaders make change happen from the way an organisation functions to the way work is performed which require changes in process leaders that are skilled in Six Sigma to be more effective.

According to RWD Technologies (2006), Six Sigma also assists to become and remain a lean organisation. (Leanness was discussed in the organisational fabric in the world-class model). Through the relentless elimination of waste (muda), a better quality of product or service is supplied efficiently and effectively.

Achieving quality and continuous improvement requires a fundamental shift in thinking and actions. An organisational change process to achieve quality and continuous improvement is proposed by Swanepoel et al (2003) who postulate that only organisations that are low cost producers (mining industry) will survive in the global village.

Swanepoel et al (2003) propose in order to achieve higher productivity levels and improve competitiveness, the twenty keys concept developed by Kobayashi be implemented. The Twenty Keys system in addition aligns global improvement methods and integrates these methods into an interrelated whole. In addition the Twenty Keys system also provides the technology to enable an organisation to benchmark against competitors and other best organisations globally.

Swanepoel et al (2003) describe 20 Keys as consisting of five main thrusts and offer a five step implementation process of the 20 Keys concept.

**The 20 Keys system consists of five main thrusts:**

- Easier
- Better
- Cheaper
- Faster
- Newer
- Easier has the objective to energise the workplace, cleaning and organising to make the work easier, rationalising the system and ensure goal alignment. Small group activities and workplace discipline are the keys to achieve.
- Better has the aim to improve quality. The keys to achieve this are Zero monitor, production and maintenance of machines and equipment, quality assurance, developing suppliers, skills versatility and cross training
- Cheaper has cost reduction and productivity improvement as the goal. Eliminate waste, empowering employees to make improvements, Kaizen of operations, efficiency control and conserving energy and materials are the keys
- Faster has the goal to improve process flow and reduce work in process (faster delivery) and efficient production scheduling, copied production and quick changeover technology are the keys
- Newer aims at developing technology and the keys are using information systems and the application of leading site technology.

A five stage process to implement 20 keys
- The first step is orientation and benchmarking
- Step two is analysis within the organisation
- The third step is to plan and train for implementation
- Step four requires implementation and
- Step five ensures review.

Prinsloo et al (1999) postulate that continuous improvement (performance enhancement) is dependent on one critical tool namely, benchmarking which is described as the search and implementation of best practise(s) that would lead to superior performance.

Prinsloo et al (1999) report a classical definition by Spendolini and Watson (1992) of benchmarking as: ‘A continuous, systematic process of evaluating the products, services and work processes of organisations that are recognised as representing
the best practises for the process of organisational improvement and is a process for measuring your company's method, process, procedure, product and service performance against those companies that consistently distinguish themselves in the same category of performance.' To sustain continuous improvement the organisation need to continuously benchmark.

Prinsloo et al (1999) distinguish five types of benchmarking:

- Process (business processes)
- Strategic, consisting of competitive, generic and tactical
- Performance
- Functional and
- Industry

It is imperative to establish upfront what to benchmark and the reason(s) for benchmarking. This is dependent on four levels of benchmarking:

- Product benchmarking refers to evaluation of competitors' products with a view to explore opportunity
- Process benchmarking refers to functional processes such as underground layouts and methods of mining due to the platinum reef gradient (dip)
- Best practise benchmarking refer to management practices especially the ones that affect attitudes and behaviour
- Strategic benchmarking has the strategic intentions or ends of the organisation in mind. The functional initiatives can then be evaluated for appropriateness individually and collectively as contributors to achieving strategic intentions (Prinsloo et al, 1999).

Achieving quality (product or service) is not a once off achievement but a continuous process. Through continuous improvement processes quality must be maintained. Six Sigma can also be applied within a continuous improvement philosophy. Productivity Futures (2007) reason that continuous improvement is a way of life – it becomes the culture within an organisation.

This philosophy according to Wilson (1995) is supported by Demings' Fourteen Points to total quality management. Point fourteen commits management
permanently to ever-improving quality and productivity through the implementation and actioning of Demings' fourteen points to total quality management. An organisation's commitment to quality and continuous improvement is dependent on an embedded culture of quality and continuous improvement.

Culture consists of values, beliefs and traditional practices according to Longenecker et al (2003). When employees value quality and continuous improvement, which is supported by a belief system, they practise a culture of quality and continuous improvement develops which is necessary for achieving outstanding success.

Quality is not an intervention but a process. The key is to ensure participation of all levels in the organisation from top management to the last person. The total Quality Management approach, Six Sigma and 20 Keys are processes and tools to achieve quality and continuous improvement. In organisational safety context a behavioural approach to quality safety and continuous improvement will not only benefit safety performance, but impact positively on business results due to process improvements and variance reduction.

2.2.3.2.3 Improved speed of delivery

Prinsloo et al (1999) distinguish four aspects with regards to speed of delivery:
- On time delivery
- Production lead time
- Production cycle time (order to delivery) and
- Stock - turnover (raw and finished goods)

- **On time delivery** is dependent on demand management. Chase et al (1992) postulate that the objective of demand management is to coordinate and control the sources of demand in order for the productive system to be used efficiently to deliver the required products on time.

Chase et al (1992) identify two sources of demand namely:
1) Dependent and
2) Independent demand.
Dependent demand occurs when one item requires the need of other items to fulfill requirements. An example can be drawn in the ordering of a sedan car. When one car is ordered, it is known that 5 wheels and a steering wheel will be needed to render it functional. This demand is a demand for a product or service caused by another demand. No forecast is required but simply an arithmetic calculation.

Independent demand on the other hand is based on how many sedan cars need to be sold (not based on the demand for another product or service).

Chase et al (1992), state that an organisation cannot do much about dependent demand except to simply meet it. However an organisation can influence independent demand (actively) or (passively) and respond to the demand. Actions that actively influence demand are applying pressure on the sales people to sell more products, lower prices and launch sales campaigns. The mother organisation, to which the mine included in this study belongs, spends a considerable amount of money on Research and Development exploring alternative markets for the use of platinum. The global jewellery industry is one example. However, in some cases, an industry may not actively pursue new or greater sources of demand. Chase et al (1992) postulate several reasons for an organisation to passively respond to demand.

Firstly an organisation might be producing at full capacity and not wish to expand for legal, ethical or moral reasons. Secondly the market may be fixed or static and thirdly the market may be beyond control. Competition boards nationally or internationally also function as control mechanisms to guard against monopolies and this may also influence responses to market demands. Competition boards function to protect the market as well.

To meet a specific demand, accurate forecasting needs to be done. For dependent demand it is pure tabulation as previously stated, but for independent demand (active or passive), forecasting need to be accurately undertaken. Chase et al (1992) distinguish four types of forecasting:

- qualitative forecasting which are based on estimates and opinions
• time-series analysis refers to utilising past data to predict future demand

• Causal relationships or forecasting assumes that demand is related to factor(s) in the environment. The technique applied is linear regression analysis.

Chase et al (1992) define regression as a functional relationship between two or more correlated variables and is used to predict one variable given the other. Chase et al (1992) state the formula applied in linear regression as:

\[ Y = a + bX \]

- \( Y \) = the value of the dependent variable
- \( a \) = the \( Y \) intercept
- \( b \) = the slope and
- \( X \) = the independent variable (in time series analysis \( X \) = units of time) (the relationship between the variables form a straight line)

Chase et al (1992) postulate that linear regression is useful for long term forecasting as well as aggregate planning.

• Simulation models allow for various assumptions during the forecasting process. These models are computer based and are programmed to assess such factors as the impact of recession in the economy and the effect of exchange rates on income. Various mathematical calculations are offered by Chase et al (1992) to calculate the four types of forecasting which will not be discussed here in detail.

Speed of delivery (on time delivery) introduces the concept of just-in-time. Two aspects of just-in-time are distinguished in a manufacturing environment, according to Chase et al (1992).

The first just-in-time is related to a set of activities that occur to produce a product utilising parts or sequences that need to be delivered on time when needed (inventory system).
The second just-in-time refers to the production of precisely the required amount (units) in the required quantities at the required time. The objective is zero defect focus.

Producing too many is just as bad as too little since waste is created (discussed during lean organisation). Longenecker et al (2003) state that the just-in-time inventory system leads to a reduction in costs (keeping stock) but needs cooperation from suppliers (discussed under partnering and lean equipment management).

- Production lead time

The Military Dictionary (2007) defines production lead-time as the time interval between the placement of a contract and receipt into the supply system of materials purchased. Two aspects namely initial and reorder in production lead-time are distinguished.

Initial production lead-time refers to the time interval if the product is not under production and reorder is the time interval if an item is under production at the time of contract placement.

In the platinum industry with a production time of platinum of six months or more (due to technology to unlock the metal) the demand -> production -> supply becomes an important factor in production planning, cost management and customer satisfaction. Long-term supply contracts are options for consideration, which eliminates uncertainty for both supplier and buyer.

Lederer (2007) argues that when a customer’s value of lead-time is known, a trade-off can be made in terms of costs to produce the item and lead time. Lead-time measures can also assist in estimating marginal cost as a means of assessing the validity to produce a specific item(s).

Dobson and Pinker (2000) stress the importance that sharing lead-time with customers under certain conditions improves profits. This may not always be the case (capacity to produce and optimal pricing). Sharing lead-time information must be preceded by a careful analysis of the potential impact on customer behaviour and pricing by management.
Demand for a product has been discussed above suffice to add that Desai, Koenigsberg and Purohit (2007) postulate that during demand uncertainty (temporary or permanent), the relationship between company production and marketing decisions especially in durable goods manufacturing is of crucial importance. The keeping and maximising of inventory impacts on costs.

- **Production cycle time** (order to delivery).

  Although Prinsloo et al (1999) describe production cycle time as that between receiving an order to delivery of the product, Burda (2006) argues that in certain instances cycle time is complete when added to finished goods inventory and asserts that in any interconnected process reducing cycle time improves the efficiency of these processes.

  Burda (2006) describes cycle time in terms of **Little's Law**.

  \[
  \text{Cycle time (CT)} = \frac{\text{work in progress (WIP)}}{\text{throughput (TH)}}
  \]

  Productivity is directly affected by cycle time since work in progress is a capital cost, which is only recovered when the customer received by the product (Burda 2006). Cycle time improvement is achieved through minimum work in progress and producing at maximum capacity.

  Tefen (2006) argues that reducing cycle time is actually calculated by establishing firstly the theoretical and secondly real cycle times of product lines. This is achieved through observation, calculations and field studies. Tefen (2006) proposes the quantification of results to identify problem areas. This assists in benchmarking performance, overall equipment and effectiveness.

  Sirvanci and Durmaz (1994), postulate that a reduction in cycle time assists in making higher quality products and services for the market. This reduction in cycle time is inter alia achieved through statistically designed experiments (quantitative techniques) especially in a manufacturing environment. Farris (1997) proposes flaw
models to accurately estimate the relationships between cycle changes and inventory levels throughout the supply chain. The advantages of flaw models according to Farris (1997) are:

- Cycle time management at all levels of the organisation and across all members in the supply chain.
- Flaw modelling identifies both the time and cost associated with a process. By applying a scheduling vector, the entire process can be emulated.

Flaw modelling contributes to strategic and operational decisions, which are critical to organisational competitiveness and can be applied in both manufacturing of goods and service industries. A flaw model is created through a three step approach (identify total cycle time, determine total cost and scheduling production of daily going rate).

Optimum inventory, identification of inventory changes, measuring of inventory risk and postponement analyses is all benefits derived from flaw modelling according to Farris (1997). In a platinum underground mining operation production cycle time plays an important part in overall production efficiency. As stated previously, mining of ore consists of three cycles namely rock face preparation, drilling and blasting and lastly cleaning (extracting blasted rock).

A crucial period in cycle time occurs between blasting and cleaning when all personnel must evacuate underground operations to allow for blasted fumes to be extracted via ventilation systems. A re-entry period of four hours between blasting and cleaning operations exist. (Cleaning is basically a night shift operation). But cleaning has two related aspects. The first is extracting blasted rock (from stoping) and the second is cleaning of waste rock through development activities. An added component is that both waste rock and rock from stopes (that bear the metal) need to be extracted from the mine either through skips in vertical shafts or conveyer belt (decline shafts). The extracting of both waste rock and metal bearing rock must be done within a 24-hour period within the three-cycle production system.
Considering partnering with suppliers (discussed under partnering in lean manufacturing), Farris (1997) argues that reductions in cycle time result in payback for suppliers as well (supply chain optimisation). Another advantage of cycle time reduction is accurate estimation of job lead – time according to Ruben en Mahmoodi (2000). When job lead times are accurately established, bottlenecks and excess capacity can be identified. Both contribute to optimisation of production, a reduction in cost but excess capacity has the advantage that in multi-product manufacturing additional products can be processed (manufactured).

- **Stock Turnover (raw and finished goods)**

The relationship between inventory (stock) and production has been discussed above in on-time delivery and production cycle time.

Inventory is closely related to the concept of waste elimination. A shortage of raw inventory creates standing-time, affects production lead and cycle time and leads to under delivery of products, which affect revenue and customer relations (dissatisfied). An over supply of raw inventory affect stock levels, which affect costs. The concept of consignment stock attempts to eliminate this occurrence. Consignment stock basically means having an item(s) on stock but the costs are borne by the supplier and only invoiced for payment once it is used in the production system.

Chase et al (1992) identify two issues closely related with the elimination of waste. The first is waste from over production and the second is inventory waste. They contend that waste from overproduction is of the worst form since raw materials are increasingly consumed requiring more handling and storage facility. While overproduction is not a big concern during market upswings (absorbed in the market) it becomes unsold goods during downswings.

Secondly, inventory waste is closely associated with overproduction, which results in additional handling, paperwork, storage facility and staff, thus increasing costs. According to Longenecker et al (2003), the principle of just-in-time discussed earlier should drive the inventory process. The keeping of inventory records consists of a three-tier process.
**The first** is a physical inventory system, which account for periodic counts of inventory.

**The second** is cycle counting which means counting different segments of the inventory systems at different times of the year.

**The third** is keeping a running record of inventory (perpetual) continuously.

It stands to reason then that turnover of inventory is the key to efficient production. Longenecker et al (2003) state that inventory turnover equals cost of goods sold divided by inventory.

\[
\text{Inventory} = \frac{\text{cost of good sold (cost of sales)}}{\text{inventory}}
\]

Since inventory is a cost, the cost of sales is also a cost. (It is expressed as costs to assist comparison). The application of the formula proposed by Longenecker et al (2003) assists with industry benchmarking.

Longenecker et al (2003) identify three concepts associated with inventory in a manufacturing environment. The first is raw - materials; the second refers to work in progress and thirdly finished goods. The objective of inventory management according to Longenecker et al (2003) is to have 'the right goods at the right time and place'. The result is ensuring continuous operation, maximising sales and protecting assets whilst the cost of inventory are minimised.

Longenecker et al (2003) state the principle of economic order quantity (EOQ) drives the process of inventory control. This means basically to establish the ideal quantity of an item to purchase (items that minimise total inventory costs). Chase et al (1992) add a second inventory control system namely fixed-time period system, which means that an order for inventory is created when a certain reorder level is reached.

Longenecker et al (2003) propose the ABC method of inventory analysis, which is based on their economic value. Category A inventory are the few high value inventory items accounting for the largest portion of costs or critical in the production process. Mining platinum for example requires labour and explosives. Having the
correct quantities of labour and the required skills mix in the production teams is critical for daily production. Just-in-time delivery of explosives means daily delivery of explosives to the operations in the correct quantities. This eliminates magazines (legal places to store explosives) and save costs. Category B items are less costly but require moderate management attention since they make up a significant portion of inventory cost and Category C refers to low-cost non critical items.

Work-in-progress inventory is a cost, according to Chase et al (1992) because producing the various products requires material, labour and sequencing equipment (material). Standing time, bottlenecks and idle time are all examples of inventory cost of work-in-progress. It was discussed previously that Burda (2006) argues that work-in-progress is a capital cost recoverable once the product is sold or invoiced (received by the customer). ‘Finished goods’ which have not been sold or received by the customer, become part of the inventory of the manufacturer or supplier until transferred to the customer. It may be called excess stock (if over produced) and is a cost to the manufacturer as a result of storage (transport and warehouse), handling and the administrative procedure costs to capture these in the inventory system.

Chase et al (1992) identify three levels of inventory namely new material, work-in-progress (partially finished goods) and finished goods. They also propose continuous inventory analyses in a manufacturing or stock keeping service to establish time periods of ordering and quantity of the orders.

In conclusion speed of delivery is determined by the end user (customer), on time delivery, production lead - time, production cycle time and stock turnover have one common denominator namely inventory. Inventory of new goods, work-in-progress and finished goods are costs and are only realised in revenue when a sales transaction is affected.

The key is just-in-time availability of material and labour, no bottlenecks or idle time during manufacturing and transfer to the end user once the product is complete. This optimises the efficiency of the operation through a reduction in costs and freeing up of cash for the business.
2.2.3.3 Satisfied customers, employees and communities

Satisfied customers, employees and the community form the second set of key performance drivers to achieve the specific business results as proposed by Prinsloo et al (1999).

The discussion will commence with employee satisfaction since Ibhar Technologies (2004) argue that employee satisfaction leads to better customer management (satisfaction). West (2007) concurs in this assertion that the single most important factor that affects customer satisfaction is employee satisfaction.

2.2.3.3.1 Employee satisfaction

Schutte (1998) postulates that keeping a motivated workforce requires management to align individual and organisational needs. The satisfying of needs have been well researched within the theory of motivation. Ivancevich et al (1996) qualify theories of motivation as focusing on the factors within the individual that energise, direct, sustain and terminate behaviour. These are Maslow's Needs Hierarchy, Aldefer's ERG Theory, Herzberg's Two-Factor Theory and McClellands' Learned Needs Theory. An additional theory named Choice Theory developed by Glasser assists to create an understanding of behavioural performance (Ivancevich et al, 1996).

Satisfying needs are important since they result in intrinsic task motivation according to Ivancevich et al (1996). Every individual has needs and because every person is unique, needs differ from person to person. Ivancevich et al (1996) describe needs as 'deficiencies an individual experiences at a particular time' and view needs as drivers of behavioural responses. The process in practise is when an individual experiences a need, a search - process to satisfy the need (eliminate tension caused by the deficiency) is activated, a cause of action is activated and specific goal-directed behaviour occurs.

Ivancevich et al (1996) offer five theories associated with satisfying needs:

- Maslow's Needs Hierarchy

Maslow argues that needs are arranged in a hierarchy. The lower order needs are physiological (need for food, drink, safety and security, belongingness, social and
love.) Higher order needs are esteem and self-actualisation. Individuals satisfy lower order needs first before progressing to satisfy higher order needs.

- **Aldefer's ERG Theory**

Aldefer distinguishes three sets of needs. Existence, relatedness and growth needs. Existence needs emulate Maslow's physiological needs. Relatedness needs are satisfied by meaningful interpersonal and social relationships while making creative or productive contributions satisfies growth needs. Aldefer's needs are not hierarchical and individuals can vary within the three sets of needs.

- **Herzberg's Two-Factor Theory of Motivation**

Herzberg distinguishes between extrinsic and intrinsic factors. Extrinsic factors related to job context namely salary, job security, working conditions, status, company procedures, quality of technical supervision and vertical as well as horizontal quality of interpersonal relations. Herzberg argues that these conditions are hygiene factors or dissatisfiers. If they are present, a level of no dissatisfaction is reached. Intrinsic factors related to job content which, when present, builds strong levels of motivation (satisfiers and motivators) and are achievement, recognition, responsibility, advancement, the work itself and the possibility of growth. When these are present it contributes to satisfaction resulting in intrinsic task motivation.

- **McLelleand's Learned Needs Theory**

McLelland postulates that when a need is strongly present in a person, it motivates a person to behave in such a way that the need is satisfied. Achievement needs are reflected in a person to take responsibility for solving problems, set moderate achievement goals, take calculated risks and desired to get feedback on performance. Ivancevich et al (1996) states that learned needs theory are associated with learning concepts. Three learned needs are distinguished namely need for achievement, need for affiliation and need for power. Affiliation needs are reflected in a desire to interact with people. An individual with a need for power for example concentrates on obtaining and exercising power and authority.

- **Choice Theory**
According to Glasser (1984), all behaviour represents a person's consistent attempt to satisfy one or more of five basic inborn needs. Outside events do not stimulate one to do anything. This is contrary to the stimulus - response paradigm. (One reacts to a red light not because it is red, but to avoid an incident or a fine). Glasser (1984) distinguishes five needs namely the need to survive, to belong, gain power, freedom and fun.

Behaving leads to satisfying a need through acting, thinking, feeling and involving one's body (physiology). Glasser (1984) argues that one always has a choice on how to behave. A person has control over how he/she acts and thinks. A person controls feeling and physiology indirectly through choices of acting and thinking (agitation and headache is a result of a choice reaction to anger).

**Behaviour is determined by its consequences.**

Petri Schutte

With regards to safety and motivation, Schutte (1998) postulates that two motivational concepts apply to behaviour modification and behaviour control namely external control and internal motivation. External control is a symptom of people learning to conduct themselves properly through external directions and control emanating from higher authority (reward or punishment is implicit). Internal motivation implies that employees will motivate themselves towards accomplishment of objectives they approve of or to satisfy internal inborn drivers or needs.

According to Schutte (1998) work force satisfaction consist of two dimensions. The first is employee attitude towards the job and secondly attitude towards the organisation. These contribute collectively to the work life experience or prevailing climate in the organisation together with perceived supportive relationships. Climate will be addressed in theoretical detail when the Safe Human Mindset Model is discussed in the section that follows within this chapter while employee satisfaction is discussed next.

Employee satisfaction is one of the determinants of organisational climate. Satisfied employees are motivated and goal achievement directed. Employee satisfaction can
be established through both qualitative and quantitative techniques. Qualitative techniques include individual interviews at regular intervals or the classic exit interview (too late but nevertheless). The Nominal Group Technique can also be applied where a specific problem statement is analysed in a group session without verbal communication. Responses are elicited non-verbally and prioritised. Recommended actions for improvement may also be elicited in this manner.

Quantitative techniques refer to scientifically validated questionnaires that are completed through random selection and responses processed and expressed in histograms or pie charts for example. Standard deviations are calculated for each question or dimension and a reliability calculation derived. These are diagnostic tools that enable the user to identify areas for improvement and assist at developing actions for identified areas for improvement.

2.2.3.3.2 Customer Satisfaction

Longenecker et al (2003) regard customer satisfaction as a result of the interaction between the customer and the organisation such that a better understanding of consumers should lead to higher levels of customer satisfaction according to Longenecker et al (2003). This requires a deep understanding of the concepts of consumer behaviour. The following diagram is a simplified model of consumer behaviour that views consumers as problem solvers.
Figure 2 – 23: Simplified model of consumer behaviour (Source: Longenecker, Moore and Petty, 2003)

Stage 1: Problem Recognition

A problem is usually realised when a consumer becomes aware that there is a deviation between the current state and the desired state. This includes quality problems with a product or service or availability of the product or service. In the view of Longenecker et al (2003), problem recognition assists the supplier (entrepreneur) to deploy the appropriate marketing strategy, which from a proactive perspective may mean influencing consumers or simply reacting to a problem.

Stage 2: Information Search and Evaluation

Consumers collect information from both internal and external services to enable them to develop evaluative criteria (features or characteristics of a product or service). This is usually done to compare brands, (products or services) and relate to market awareness (Longenecker et al, 2003).

Stage 3: Purchase Decision

Once a consumer has made a choice for a specific product or service, a decision needs to be made as to where and when to affect a purchase. This is influenced by information technology through the Internet, e-purchasing, purchase facilities (shops, layouts, sales people and displays of products).

Stage 4: Post-Purchase Evaluation

In line with cognitive dissonance theory, a consumer may experience anxiety after a purchase. Longenecker et al (2003) stress the principle of quality customer service (before and after a sale) that assists a consumer to work through anxiety experienced in a post purchase phase. They state that psychological influences consist of needs, perceptions, motivations and attitudes that form a major component in the consumer behavioural mode.

Needs are the starting point of behaviour (the satisfying thereof). According to Longenecker et al (2003), various needs operate at the same time, thus a needs-based strategy would assist in different marketing strategies. Their rationale is that
consumer needs differ when buying food at a hypermarket (to satisfy a psychological need) from eating at a restaurant (satisfying social need combined with a psychological need) or to purchase kosher or halaal foods in terms of religious beliefs.

Perceptions are individual processes that give meaning to the stimuli that confront consumers. Perceptions have two components. The first is perceptual categorisation where things that are similar are grouped together to deal with huge quantities of stimuli.

Marketing strategies must take cognisance of this especially if new products are offered that are similar to existing products. This assists the second component namely the perceiver. When a new product with new features is produced, unique brand naming is proposed to avoid consumer distortion. From a marketing communication strategy perspective, consumer perceptions play a major role according to Longenecker et al (2003).

Consumer motivation must be investigated before a marketing campaign can be implemented. Motivation is generated through experiencing discomfort (unsatisfied needs). These needs are physiological social, psychological and spiritual, precisely because they drive behaviour through motivation.

Attitudes are enduring opinions based on knowledge, feelings and behavioural tendency (Longenecker et al, 2003). Attitudes impact direct on behaviour since a consumer's attitude to purchase a product or service may be price influenced, but this could also be offset against quality.

Sociological influences complete the consumer behaviour model and consist of culture, social class, reference groups and opinion leaders. Longenecker et al (2003) define culture in marketing as the 'behaviour patterns and values that categorise a group of consumers in a target market'. These patterns and beliefs influence the purchase and use of products. Cultural norms influence what consumers buy therefore marketing strategists must be acutely aware of this phenomenon.
Social class refers to divisions in society having different levels of social prestige. Longenecker et al (2003) postulate that different social levels are associated with different levels of social prestige and certain products may be associated with a specific kind of lifestyle. Social class is also determined by occupation, possessions, sources of income and education.

Reference groups are those groups whom individuals allow to influence behaviour (peer group uses specific brand name clothing). Individuals allow group influence as a result of perceived benefits they receive (continuous membership of the group satisfy social need).

Opinion leaders are the final influence in consumer behaviour. Longenecker et al (2003) state opinion leaders form an important component in the communication process (when promoting campus clothing student beauty queens may be used as models).

Another aspect in customer satisfaction relates to product strategy where the product as the total bundle of satisfaction (product and or services) offered to consumers in exchange for a transaction (Longenecker et al, 2003). Product strategy is described as the manner in which a product component of the marketing mix is used to achieve the objectives of the organisation (Longenecker et al, 2003). The under mentioned concepts form part of the product strategy namely product item, product line, product mix and product mix consistency.

- Product item is the individual item in a product mix (for example a specific car and model).
- Product line is the sum of the related individual product items (few models within the same range of sedan cars)
- Product mix refers to an organisation's total product lines (sedan cars, pick-ups and trucks).
- Product mix consistency refers to the similarity of product lines in a product mix.

Longenecker et al (2003) argue that the product strategy of an organisation is determined by the nature of the items included in the product mix. The more items in
a product line, the more depth it has. The more product lines in a product mix the more breadth it has. These strategies are designed to do two things. Firstly they address a specific market demand (need) and secondly, they ensure the economic viability of the organisation.

The quality aspect in terms of product and services have been addressed suffice to mention that both product and service is reliable and satisfactory when the customer decides that it complies with requirements. Chase et al (1992) point out that quality principles or demands from customers need to be assessed by marketers (product designers) to establish exactly what customers want. Product designers need to translate these into product design and product manufacturers need to manufacture the product to quality design (demand and specifications set by the customer).

West (2007) suggests that there is more to customer satisfaction than customer service and proposes ten factors that influence a customer’s decision to return or not to return.

- Firstly quality is no accident. The customer must be satisfied with the quality of the product.
- Secondly separation anxiety occurs when separating a product from other similar ones through marketing, customer service and product quality.
- Thirdly Access 2.0 refers to electronic purchasing through the Web.
- Fourthly, at face value means when a product or service is more costly, but worth it, the customer accepts the value.
- Fifthly, a friendly atmosphere in a clean, safe and well-organised environment attracts customers.
- In the sixth instance the waiting game is described as ensuring that product and services are delivered on time when required by the customer.
- The seventh factor is the one R: Responsibility, which refers to honesty, which encourages customer satisfaction.
- The eighth factor is to hold on to what you have. Keeping satisfied customers is more profitable than obtaining new ones resulting in long-term customer relationship.
• The ninth factor is you are hopefully in good hands. This is translated into customer care through sharing of information and creating a feeling that customer opinion counts resulting in customer satisfaction.

• The tenth and last factor is 'tech is not just for geeks'. Flashy websites is not the answer. Continuous improvement to keep up with technological developments (product) or service (electronic customer complaints) can assist in improving the quality of the purchasing experience.


These are:

- Customer suggestion schemes
- Customer complaint schemes
- Customer satisfaction surveys which may be qualitative or quantitative processes
- Ghost shopping.

The Customer Satisfaction Model of Kano (1984) is a process that assists quality management and marketing to establish customer satisfaction (12 Manage.com). Six factors of quality attributes of which the first three directly influence customer satisfaction, are distinguished in the Kano (1984) model.

• The first is basic factors.
  These are satisfiers (must have) and are minimum requirements that will cause dissatisfaction if not fulfilled. When fulfilled it will not lead to customer satisfaction but are pre-requisites and taken for granted.

• The second are excitement factors (satisfiers: attractive)
  These are factors that cause satisfaction if delivered but if undelivered does not result in dissatisfaction. These assist organisations to distinguish themselves from competitors.

• The third is performance factors, which cause satisfaction if performance is high and dissatisfaction when performance is low. These factors are explicit to customer needs and desires and an organisation must be competitive in this sphere.
• The fourth factor is indifferent attributes that describe a customer as being indifferent (don't care).
• The fifth factor is questionable attributes where it is unclear if the customer expects these attributes at all.
• The sixth factor is reverse attributes, where the reverse of a product feature was to be expected by the customer. An additional benefit to the process model proposed is that in an internal customer organisation, the model is applicable as well (manufacturing process).

Being good enough is not good enough
Give customers a reason to be faithful
- Graham Roberts – Phelps

In conclusion, understanding consumer behaviour assists to understand the potential or existing customer, which enables satisfying customer needs. When needs are addressed it becomes easier to anticipate customer behaviour towards a product or service. This, in turn provide opportunities for taking proactive steps, from designing and producing a product up to marketing the product or service to customer requirements. The key is measurement through both qualitative and quantitative processes that enable action to ensure customer satisfaction.

2.2.3.3 Community Satisfaction

Community satisfaction is the final key performance driver to business results within the World-Class Model.

Recent developments where communities in the Gauteng area in South Africa reacted violently against being classified within the North West Province and not Gauteng reiterated the importance of community satisfaction. The organisation included in this study has been involved in a recent court case emanating from the dissatisfaction of communities in the Steelpoort area in Mpumalanga. The mother organisation of the mine included in this study is currently actively negotiating with communities in the Limpopo Province (near the town of Mokopane where the organisation is operating a mine) to resettle residents as a result of intended mining
operations (Mining Weekly, 2007). A similar process was conducted in 1998-1999 to resettle one hundred and eighty families as a result of mining operations.

The organisation presented in this study prescribes to the Chamber of Mines of South Africa and World Bank benchmark guidelines in these regards. A corporate social investment budget is allocated on a long-term planned basis to address community needs. These needs have been established through the application of a scientific Social Economic Assessment Tool (SEAT) developed by Environmental Resources Management Southern-Africa Pty. Ltd. A report is generated that acts as an implementation and control guide for the organisation and is shared with communities. Monthly scheduled community meetings through established forums act as control framework.

The principle of community satisfaction specifically in the mining industry is entrenched in legislation. The Mineral and Petroleum Resources Development Act and Regulations Act 28 of 2002 specify for instance a Mining Charter with nine major objectives or areas to be addressed by the year 2009 for each mining company who wishes to convert mining rights (licence to mine). Chapter 7 section 100 (2)(b), of Act 28 also requires the mining charter to state how these objectives will be achieved.

Mines developed Social and Labour plans to comply with the legislative requirements and, where applicable liaised with communities to obtain commitment. This will assist to achieve Mining Charter objectives. Local purchasing is for instance assisting Black Economic Empowerment and prospective entrepreneurs are being trained in business skills and linked to the mine supply chain.

A mine also needs to establish a detailed environmental plan prior to obtaining a mining licence in terms of Chapter 2 section 5 (4) of the abovementioned act. This needs to be verified by and communicated with local communities where applicable. Establishing community satisfaction has various dimensions and can be established in a number of ways.

Town communities for instance have other needs than for example rural communities. Town communities have established water, electricity and waterborne
sewage systems and the maintenance of these are conducted by Municipalities through municipal rates and taxes. Rural communities do not have these luxuries and satisfaction levels will differ from folk in established towns. Rojek (1974) for instance established that community satisfaction in municipality oriented services varied in terms of size, town, village or country - side. A study conducted by Vogt, Allen and Cordes (2003) identified social attributes, environmental and consumer services, local government services, health, transportation, wellness services as contributing to community satisfaction that motivated residence or migration from one area to another.

The application of the SEAT process in the organisation included in this study identified certain social and economic needs namely employment, recruitment and skills development, procurement and business development, environmental, housing and infrastructure, odours from sewage works, crime as a result of the influx of job seekers (social), poorly structured houses, road infrastructure and drainage, small business development, community development, social investment as well as health and home based care givers. In summary, these can be classified as social, economic, health, infrastructure, and community development and social investment. Special measures are developed to measure performance in these identified areas.

Community satisfaction also has an influence on individual wellbeing. This is confirmed in a study conducted by Theodori (2001). Satisfaction within the community and attachment to the community associated independently and positively with individual wellbeing. Prinsloo et al (1999) identify three processes to establish community satisfaction.

The first is a partnership relationship with community shareholders.

The second is to establish community satisfaction through surveys, which may be quantitative (empirical) or quantitative (house calls through verbal responses).

The third is conducting and sharing of environmental audit results (organisation performance). The organisation included in the study operates in a joint venture (not
a partnership) with the Royal Bafokeng Nation on a 50:50 basis (community within which it operates).

Community satisfaction finds its origins in the theory of organisational performance management. Community satisfaction surveys may also be used to determine organisational performance. Hubbard (2006) refers to community satisfaction as stakeholder theory (Freeman 1984, Reich 1998 and Post et al 2002) and argues that it has a wider perspective than shareholder theorists. Stakeholder theory identifies employees, customers and suppliers as well as other interest groups whose wellbeing is affected by the performance of the organisations as stakeholders.

Organisational performance is assessed against the expectations of various identified stakeholders. Hubbard (2006) postulates that the stakeholder perspective offers a more appropriate base for measuring performance in an organisation. One aspect of performance from a stakeholder perspective is environmental and health and safety management. The mine that is reflected in this study subscribes to ISO 14001 specifications (internationally certificated). In terms of Health and Safety, the organisation included in this study is an ISO 18001 certificated organisation. Hubbard (2006) proposes the balanced score card developed by Kaplan and Norton (1992) as a measure for organisation performance management.

According to Hubbard (2006) the Triple Bottom Line (TBL) concept developed for organisational performance, adds social and environmental measures in addition to economic measures and has a wider application in terms of adding stakeholder perspectives to organisational performance. Measuring performance is one aspect but sustaining performance over the long term requires strategy and sustainable development.

The term sustainable development evolved through a focus on development and defines sustainable development as ‘development that is aimed at meeting needs and aspirations presently without jeopardising the ability of future generations to meet their needs’ (Hubbard, 2006). At organisational level Hubbard (2006) defines sustainability as 'any state of business in which it meets the needs of its stakeholders without compromising its ability also to meet their needs in future', and also argues
there is a responsibility on a company to ensure that its operations are sustainable with regards to economic, social and environmental performance.

The impact of sustainability on organisational strategy, sustainability acts as an input into organisational strategy since it is viewed as a force to comply with, a direct cost and an opportunity for competitive advantage. Organisation strategy is about creating value or adding value to the organisation. These values are not just economic growth in Rand and cents. Hubbard (2006) proposes that the Genuine Progress Indicator (GPT) as measures for societal growth and improvement are alternatives to Gross National Product Measures (GNP).

With regards to sustainable performance measurement in the organisation, Hubbard (2006) argues that in the first instance balanced scorecard measures and triple bottom line measures are complimentary to each other and build on each other. Both economic and social aspects are covered in these two measurement approaches. Since communities are becoming more involved with the wider responsibilities of an organisation (environmental and social), it warrants measures to track and substantiate performance. The Johannesburg Securities Exchange (JSE) and the Paris Stock Exchange for example have mandatory sustainability reporting as a requirement for listed companies.

Companies do not only exist for profits and do not operate in isolation. Sustainable development is a key element that impacts on the strategy an organisation pursues to realise its objectives. These objectives must be aimed not only to create wealth, but also develop win/win scenarios for all stakeholders of the organisation that add value. The balanced scorecard and triple bottom line measurement systems are designed to measure overall organisational performance towards realising organisation strategy. In an environment where there is constant interaction between an organisation and the communities within which it operates, community satisfaction is an important consideration for overall organisational success.

2.2.3.4 Culture
Organisation culture has often been described as the glue that keeps organisations together – the way things are done. Robbins et al (2003) describe organisational culture as ‘a system of shared meaning amongst its members’. This assists in distinguishing one organisation from another. Organisational culture consists of building blocks, which do not follow on each other, but co-exist and have a reciprocal influence.

Corporate culture plays a decisive role in organisation culture. Prinsloo et al (1999) argue that it is the foundation on which an organisation is built. Veldsman (2003) defines corporate culture as common, though unique ways of understanding, interpreting and reacting to entities, events and outcomes, which are shared by organisational members. Norms, values, beliefs and assumptions influence and are in turn influenced by attitudes, which result in behaviour (action(s)). Miller (2003) states values display two characteristics. The first is content in that a value is perceived to be important. The second is intensity in that it portrays how important the value is. It therefore contains an element of judgment by an individual (importance and intensity) according to Miller (2003).

Post 1994 South Africa is characterised by equity and transformation in the workplace. The integration of values across cultures becomes a challenge to success. According to Miller (2003) values are supported by norms, which are acceptable standards of behaviour shared by members of a group. Norms are prescriptive in that they tell members what they should or shouldn't do in certain circumstances.

Keyser (2003) distinguishes four classes of norms:
The first is performance norms, the second is appearance norms, the third is social arrangement norms and the fourth is allocation of resources norms.

- Performance norms are typically how a team member must work to contribute to success.
- Appearance norms refer to dress codes for example.
- Social arrangement norms regulate social interaction within the group, type of friendships and off-the-job socialising.
• Allocation of resources refers to allocations of difficult or specific tasks to specific members of the group.

Beliefs, according to Davies (2002) influence standard practice and are for example beliefs about quality work, risks, participation in decision-making. Beliefs function on the individual and group levels and contribute to culture. Assumptions, according to Schein (1985), function on the third and deepest level of organisational culture where the tacit, unseen and cognitively unidentified elements of culture, are often taboo elements of discussion.

The first level is organisational attributes that are visible (facilities, offices, awards and recognition). The second level describes the professed culture, which is expressed in slogans, mission statements and local and personal values openly expressed. Leaders may express democracy and participation in the second level, but contradict this at the third level (with autocracy).

A world-class culture according to Prinsloo et al (1999) is compared to a crocodile and is characterized by growth, vision, progression, learning and peak-to-peak performance as it adapts to ensure survival.

Robbins et al (2003) argue that in big organisations, dominant and subcultures may exist. A dominant culture finds expression in the sharing of core values by the members of the organisation and unique values may exist to express dominant values. Robbins et al (2003) state subcultures may develop due to the geographical spread of branches that belong to a mother company (for example corporate offices in Johannesburg and mines in North West, Limpopo and Mpumalanga).

Robbins (1996) suggests seven primary characteristics of organisational cultures which find expression on a continuum varying from low to high and reflect an understanding of individuals about their organisation:

• The first is innovation and risk taking that reflect the degree to which employees are encouraged to innovate and take risks.
• Secondly attention to detail reflects the expectations of employees to be precise, analytical and pay attention to detail.
• In the third instance outcome orientation versus processes and procedures to achieve results.
• Fourthly people orientation is reflected in the degree management considers the effect of outcomes on people.
• In the fifth instance team orientation is reflected in the degree to which work is organised in teams and not individuals.
• The sixth characteristic is aggressiveness and is portrayed in the degree to which employees aggressively and competitively pursue goals versus being easy going.
• The seventh characteristic is the degree to which organisational activities emphasize growth in opposition to maintaining status quo.

An important factor to mention is the fact that national culture will have a greater impact on individuals than organisational culture (Robbins, 1996). In a democratic South Africa authoritarian management will be challenged and difficult to maintain.

Robbins et al (2003) maintain that organisational culture has specific functions. It provides boundaries in that it creates distinction between one or more organisations and secondly it provides identity to members. Thirdly it fosters commitment to something larger than individual self-interest. Fourthly, it enhances stability of the social system and provides standards for individuals’ behaviour. Finally culture acts as control mechanism in that it guides and shapes attitudes and behaviour. Attitudes are evaluative and are expressed in how employees feel about their job, rewards and the organisation (Robbins et al 2003). Attitudes will be discussed further in Chapter 2.3 in The Safe Human Mindset Model. Culture is descriptive and directive in that it inquires how people perceive the culture. It is directive in that, once established, culture facilitates, directs and guides behaviour.

Veldsman (2003) forwards that culture is activated into action by means of culture carriers. Cultural carriers generate, enhance, sustain, protect and renew the corporate culture through role models, interaction problems, the way coaching and mentoring is conducted, socialisation and the way power and influence is exercised.
These are the software in the business. The hardware is described as strategy formulation (processes), how information is shared, as well as leadership and management practices.

According to Robbins (1996) a culture in an organisation is created by its founders as a result of a vision that the founder(s) has for the organisation. Once customs and ideologies are shared throughout the organisation, the organisational culture is sustained through practices within the organisation. Various human resource practices reinforce the organisational culture. The selection process of people, how performance is managed and rewarded, human resource development processes and promotions reflect the culture within an organisation.

Robbins (1996) argues that three important forces in particular act to sustain organisational culture.

The first is the selection process. Selection, according to Robbins (1996) is a dual process. Once the process of identifying people that meet the job criteria in terms of knowledge, skills and abilities to perform have been established, establishing organisation fit prior to engaging a prospective employee based on the judgment of the person that hires the employee, takes place. The second process is where the applicant, during the selection process learn more about the company and may decide to withdraw due to a clash of personal and organisational values.

The second important force is top management, who, through their actions, impact on organisational culture. The spoken word and examples set through actions filter down the organisation as norms. These include risk tolerance, empowerment versus control, dress codes and rewards in terms of performance and behaviour (financial and promotions).

The third force is socialisation, which assist an employee to adapt to the organisational culture. Robbins (1996) associates three processes with socialisation. The first is the pre-arrival stage which is characterised by individuals that have, through previous experience or studies, developed a set of values, attitudes and expectations, which might or might not be compatible with the organisation to which
the person applies for employment (The dual process to establish ‘fit in’ discussed above). Success in applying for a job is characterised to what degree both employer and employee have correctly established or anticipated the desires of each other.

The second is the encounter stage where the individual weighs up expectations versus reality and address any dichotomies that may exist. Socialisation assists an individual to adapt to expectations and realities. Teamwork, for example, in underground operations is important and working in synergy with other departments a requirement.

The third and last stage is the metamorphosis stage where an individual adapts to the group’s values and norms. Not only are norms internalised and accepted by the individual, but a feeling of acceptance by peers as a trusted and valued person also develops. This assists self -confidence, which is further strengthened by an explicit knowledge of rules and procedures, how performance will be evaluated and the required standards of performance. These factors contribute to the retention of the employee.

It has been stated that to change an organisational culture is difficult, especially in strong developed cultures where values, beliefs, norms and assumptions have been entrenched into practices.

Robbins (1996) however assures us that changing culture is possible and offers conditions under which culture can change. The first is crisis, which may be as a result of financial loss, market or disaster. Crisis can also be introduced for example retrenchments due to poor performance of an organisation, which require cutbacks. Secondly, through the turnover of leadership at the top who have new ways and ideas and bring other ideas to an organisation. Thirdly young and small organisations do not have the problem of entrenched cultures that plague large organisations. Fourthly weak developed organisational cultures where values and norms have not been entrenched are more susceptible to change.
Organisational culture directs employee behaviour through entrenched values, beliefs norms, assumptions (that determine attitude) and specific functions. The existence of organisational culture does not just happen, but is created, sustained and changed (when required). This happens through either natural processes or imposed processes; the latter aimed at changing the organisational culture.

It stands to reason that in order to create a world-class organisation; the culture in the organisation needs to reflect the processes and behaviour directed to becoming and sustaining word-class. This is inherently a corporate philosophy that needs to be entrenched into the organisation.

Finally, the World-Class Model comprises of two key financial measurements: competitiveness and profitability.

### 2.2.3.5 Key Financial Measures

#### 2.2.3.5.1 Competitiveness

Competitiveness is the first business result in the World-Class Model. Global markets influence the South African business environment and in certain instances dictate price of product internationally (the gold and platinum price for example). Competing and surviving both nationally and in certain instances internationally have become the playing field and hallmark for companies. In the international context Chase et al (1992) for example define competitiveness for a nation as the degree to which it can, under free and fair market conditions, and within internationally set standards, produce goods and services whilst maintaining and expanding the real income of its citizens.

Chase et al (1992) argue that competition occurs at different levels.

- At international level there is competition within and for global markets.
- At national level companies compete with one another (the ones with similar interest for market share).
The success or failure of a firm is determined by the extent an organisation can compete in a specific market or industry. Competition is about winning and according to Porter (1985) this is achieved through finding and implementing competitive strategies that places an organisation in a favourable position within a market or industry. Competitiveness is achieved and maintained through ensuring competitive advantage.

Longenecker et al (2003) describe competitive advantage as a benefit that exists when an organisation has a product or service that the market experience as superior to other competitors. The common approaches to competitive advantage according to Longenecker et al (2003) are price and value as well as the image of the organisation:

**2.2.3.5.1.1 Price or value**

Various pricing strategies can be pursued according to Longenecker et al (2003). These are as a result of break - even analysis (which gives a feasible price for a specific product) but determining price must also consider market characteristics and the specific marketing strategy that is pursued (Longenecker et al, 2003). These strategies are:

- **Penetration pricing** which means setting lower than normal prices to a product or service to either gain rapid market share or to increase market share.

- **Skimming pricing** which means setting extremely high prices for a products or services for limited periods of time before reducing them to more competitive levels under the supposition that consumers are prepared to pay more for an item because it is valued.

- **Follow-the-leader pricing** uses a specific competitor as a role model for setting prices.

- **Variable pricing** is used to offer price concessions to certain customers as a result of for instance a customer's bargaining power. Dynamic pricing can also be used as a variable pricing strategy when charging exceeds the normal price as a result of assessing a customer's financial means (ability to pay) and the desire for the item.
• Price lining establishes distinct prices at which similar items are for sale. The Coquis men's suits where you buy one and get one for a rand is an example. Quality and inventory levels are factors for consideration in using price lining.

• What the market will accept is a strategy that can only be pursued when there is little or no competition.

• Value pricing needs to be considered since, when not too low, prices create customer expectations that become difficult to meet.

Gale (2006) offers a technique called customer value analysis that assists to determine value – based pricing. Two components are analysed in relation to each other namely product performance versus customer ownership (using the product or service.)

**Price is what you pay**
**Value is what you get**

- Warren Buffet

Kotelnikov (2006) reasons that a company only exists to create value for the customer and since ones values determine what one does, a specific value proposition must be delivered to a defined market to ensure existence. A value proposition describes the customer problem, the solution to the problem and the value of this solution from a customer prospective. The existence of any company is based on this premise. Kotelnikov (2006) suggests three stages in the quest for value.

• The first is quality, which was discussed previously.

• The second is single value discipline, which may entail best cost, best product, or best total solution or all three in one product or service. Successful managers identify this single value and build their organisations on it.

• The third is customer intimacy that means customers are not anonymous but continuously change expectations, not only about products or services, but also the results from both. This assists in defining value for the customer.
Butcher, Sparks and O’Callaghan (2002) postulate that the nature of interaction (and not the number) between customer and individual employees are as important as price, value and convenience for repeat purchasing. The customer’s perception of value needs to be determined and evaluated on a continuous basis. This implies intimately knowing the customer to enable one to respond.

Both qualitative and quantitative techniques may be applied to understand both the market and the customer according to Lucent Technologies (1997). These are, inter alia Bayesian modelling systems that assist in decisions about product selection, process improvement and customer satisfaction, which assist management in formulating customer strategies.

- Unique service features of product or service which may include special product attributes or personal service (consignment stock, direct contact with service managers where there is no complaints department)
- Notable product attributes which distinguish a product from similar products or services (for instance in drill bits the use of diamond or tungsten in stead of normal treated metal bits) and
- Customer experience is referred to as the feeling that customers have when interacting with the company.

Allen, Reichheld and Hamilton (2005 report a study between perception and reality of customer experience resulted in only eight percent of customers confirming the perception of customer experience).

Allen et al (2005) postulate the three ‘D’s to customer experience.

The first is design the right offers and experiences for the right customers through designing the right propositions. This focus originates from a belief that customers interact with various segments in a company (sales, manufacturing, service (maintenance), inventory and finance). The experience of the customer at all these contact points needs to be adjudicated against standards of delivery.
The second is delivery propositions by focusing on the entire organisation or cross-functional collaboration. This is achieved through establishing cross-functional teams that deliver their value propositions across the total customer experience. This delivers value to the customer.

The third is developing the capabilities to do it again and again. Continuous innovation leads to continuous performance improvement.

Capabilities that achieve systematic innovation and improvement are:

- Integrated marketing plans assist customer focused planning and execution.
- Accountability is established through customer-based metrics and closed feedback loops.
- Customer-focused management incentives through performance management reviews.
- Customer convenience is achieved through promoting convenient access for the customer to the organisation. A number of factors play a role in customer convenience.

- The first is geographical accessibility. Cho (2006) developed six factors affecting customer needs of geographical accessibility in electronic commerce. These are degree of product tangibility, product standardisation, on-line interaction and customisation, off-line interaction and customisation, price level and the reputation of the organisation. In electronic commerce web site access, toll free numbers and electronic billing and payment are also factors for consideration (Intuit Inc., 2007).

- The second aspect is the type of service or product. Bruno (1989) argues for instance that in supermarkets, convenient foods (whether pre packed or prepared on site) will eventually surpass convenient stores. Cho (2006) states for example that in health services care is the success factor whilst hairdressers offer comfort and relaxation as critical convenience factors. In banking, on-line banking is a critical factor through the Internet (Oregon Coast Bank, 2004) and recently through cellular (SMS) phone.
Longenecker et al (2003), cautions that a competitive advantage does not last forever. Markets change, economics change and even countries change through political changes. Sustaining competitive advantage (adapting a value-creating position in industry that is likely to continue over a period of time) builds customer loyalty (Longenecker et al 2003). The key is to build competitive advantage into strategy. Another is to find alternative ways to reinvest performance outcomes (revenue, customer loyalty) to renew the basis of the competitive advantage on the long term. Competitive advantage has a three-stage life cycle. The first cycle is development where a company invests sufficient resources to develop a competitive advantage, which is deployed (second cycle) to enhance performance (third stage). This last cycle declines over a period of time as a result of competitors applying these advantages into their own strategies (Longenecker et al, 2003).

In order to sustain performance over a period of time, Longenecker et al (2003) argue that a continuous stream of competitive advantages needs to be developed by an organisation. These are focused on products and or services and entails capitalising on opportunities that exist or emerge within the organisation (internally) or in the market (externally).

Longenecker et al (2003) propose a competitive advantage model for organisations. In order to understand these, companies must evaluate both the internal and external environment, to enable the correct choices. This is achieved through a process of strategic planning. The external environment analyses assist with establishing trends in the market as well as emerging opportunities. These are matched with internal analysis of what the organisation is able to accomplish (Longenecker et al, 2003).
Figure 2 – 24: A model of competitive advantage (Source: Longenecker et al, 2003)

Longenecker et al (2003) profess that the purpose of strategy is to develop a plan of action to coordinate the resources with the commitments of the organisation that enables superior performance taking cognisance of the organisation's situation (reality). A four - step process (that takes both the external and internal environment into consideration) is suggested by Longenecker et al (2003) to determine and select strategies.

The first is an evaluation of the external and internal environments. The external environment is characterized by three elements.

Firstly the general environment consists of:
- Macro – economics, where issues like inflation, exchange rates and investments, which influence business growth, are examined
- The political and legal factors take factors of laws (tax, industry) and regulations and deregulations into consideration
- Technology, which is critical for new ventures
- Global factors for example emerging markets, global investment opportunities and outsourcing opportunities.
- Ecological and environmental issues that impact on the business.

Secondly the industrial environment is driven by five forces, which determine the nature and degree of competition namely:
- Threat of new competitors
- Threat of new product and or services
- Degree of competition amongst existing competitors
- Suppliers bargaining power
- Buyers bargaining power.

Thirdly change-based sources of opportunity refer to factors that need to be considered in the environment prior to introducing or expanding a product or service. Change-based sources that need to be considered are:
- Unexpected events that could lead to success or failure
- Incongruent expectations where what is expected is out of touch with practicalities
- Process needs where current technology is insufficient to address emerging opportunities
- Structural changes in markets and technology that alter the industry
- Demographics characterized by population, education, income variance
- Perceptual changes of products or services that influence demand for a particular product and or service
- New knowledge that contribute to new products with a commercial potential.

Assessing the internal environment (assessing potentials in the organisation) is the next step in the strategic planning process and consists of:
- Organisational resources and capabilities (capital, people, technology and equipment)
- Patents and copy writes.

Capabilities are characterized by integrating various resources to create an advantage.
Core competencies are those that provide the organisation with a competitive position in the market.

The second step is to evaluate and match the external and internal environments through a strength, weakness, opportunities and threats analysis. The external environment is subjected to an opportunities and threats analysis whilst the internal environment is subjected to strength and weakness analysis. This process is a strategic situational analysis (current situation) and may be deemed static.

Binedell (2007) proposes a process of mapping to deal with change, competition and complexity. Making maps through deciding what needs to be done is more important than reading maps (accepted what others have decided as important). Being smarter than competitors require the ability to assess where one is and not what one does. Through making maps the internal and external landscape of where one operates, changes in the market and the forces of social change and lastly the increasing speed and delivery that characterised correct business are considered.

The third step is to determine best opportunities from the swot analysis conducted.

The fourth and final step is to select strategies that would capture opportunities. This is conducted through a two-tier process where broadly broad-based strategy options and secondly specific focus strategies are derived.

Broad based strategy options are complemented by specific cost based strategies (to be the lowest cost producer) or product and or service differentiation. The latter is aimed at distinguishing the organisation's product or service from the other companies within a market.

Focus strategies are plans of actions that target a specific segment within a market. These are based on specific strategic decisions on the intended direction that an organisation takes in relation to customers and competitors. According to Longenecker et al (2003), focus strategies have the advantage that it restricts focus to a single subset of customers, emphasising a particular product and or service, limits the market to a single geographical region and concentrates on superiority of
product and or service. Maintaining the potential of a focused strategy invariably attracts competition according to Longenecker et al (2003) since success draws attention, which may erode competitiveness (market share).

Longenecker et al (2003) associates survival, customer satisfaction, market share and profits as ultimate business results. Re-investment of results into the foundations of the organisation assist to maintain the stream of competitive advantages which is required to sustain business performance over the long term and ensure survival. Prinsloo et al (1999) postulate that the competitiveness of an organisation can be expressed in three dimensions namely market share, image, reputation and profitability (The profitability aspect will be addressed separately as the second aspect of business results within the World-Class Model).

Market share is also associated with business results in the competitive advantage model. Market share in strategic management and marketing terms is defined by The Wikipedia Free Encyclopedia (2007c) as the percentage or proportion of the total available market (segment) that is serviced by an organisation and is expressed in two ways:

The first expression is:

| Market share = Firms sales / Total market sales. |

The second is:

| Market share = unit sales (volume)/total units volume sold in the market |

The latter is applicable in the platinum mining industry which is expressed in terms of total ounces produced or total ounces sold to the market/total ounces sold on the market by all producers and also total ounces sold by a producer/total market demand.

Total market sales figures may not be readily available and may be required from trade associations and market research organisations according to Quick MBA (2007). In the platinum industry analysts play an important role in creating and
maintaining market intelligence. This assists platinum producers with strategy formulation.

According to Quick MBA (2007), market share is the performance of an organisation relative to its competitor(s). Sales figures do not reflect performance accurately since sales figures may be reflected in changes in the size of the market as well as changes in the economy, both nationally and internationally. The performance of an organisation (market share) relative to its competitors is expressed or measured as the proportion of the market that the firm is able to capture. Quick MBA (2007) propose an equation to model market share.

\[
\text{Market share} = \text{share of preference} \times \text{share of voice} \times \text{share of distribution}.
\]

Market share is driven by three forces:

- Firstly share of preference can be increased through product, pricing and promotional changes.
- Secondly share of voice (an organisation's proportion of total promotional expenditures in the market) can be increased through advertising expenditure.
- Thirdly share of distribution is increased through more intensive distribution (Quick MBA, 2007).

Quick MBA (2007) postulates that changing the variables of the marketing mix can assist in increasing the market share.

- Product attributes may be changed to provide more value to the customer through improved quality.
- Price decreases may assist if the elasticity is > 1 (decrease in price increases sales revenue) and when competitors are not able to meet price cuts.
- Distribution channels means adding new channels or increasing the intensity of existing channels.
- Promotion through increased advertising expenditure can increase market share only if competitors can't respond similarly.
Quick MBA (2007) reasons that market share is often associated with profitability and organisations may endeavour to increase their sales relative to competitors. The reasons are:

- Economies of scale where higher volumes assist in developing a cost advantage
- Sales growth in a stagnant industry where the organisation grows its sales by increasing market share
- Reputation where market leaders have standing, which may be used to their advantage
- Increased bargaining power since large players have advantages when negotiating with suppliers, distribution channel participants and buyers.

Conditions may also exist where increasing market share is undesireable. Quick MBA (2007) postulates five conditions in this regard.

- When an organisation is near its production capacity, increase in market share may require investment in capacity, which may not be optimally utilised. This will result in increased costs
- A decline in overall profits may be experienced if market share is gained through increasing promotional expenditure or decreasing price
- In an attempt to regain market share a competitor may lower prices resulting in a price war
- Small niche players who capture a small share of the market may be tolerated only until they decide to increase their market share, which may result in a more competitive player to enter the niche market
- When an organisation dominates its market it may lead to antitrust issues (Competition boards both nationally and internationally guard against these practices.)

A decrease in market share may also result in increased profitability where an organisation actually drops unprofitable customers and loses market share (Quick MBA, 2007).

The cost component of competitive advantage in a platinum mine has been discussed in the previous section. Cost per ounce platinum produced is not the only
measure or indicator of competitiveness. Benchmarking indicators (also discussed previously) is another. In organisational safety terms lost time injury frequency rates are also indicators that reflect the safety performance (Sutherland et al 2000). These are expressed as the number of lost time injuries, serious injuries and fatalities expressed as a rate per 1,000,000 employees. Share price is another indicator of competitiveness if a company is a public listed company on the securities (stock) exchanges (nationally and globally).

The role that analysts play cannot be overstated. Another factor for competitiveness is a mines’ ore reserve base. This is an indicator of the future ability to mine.

Since the platinum reef is exposed in certain areas on surface (North West) and then dips to depths of 1200 m and more, different mining methods are applied to mine the reef (up dip, down dip, breast, long walling and opencast). These methods also differ in costs to extract (mine) the reef. Geological structure is a serious factor for consideration as is safety when a decision on a specific mining method is made. The quality of reef is expressed in terms of grams reef per ton ore and is geologically predetermined. Competitiveness in this instance means extracting the ore at the predetermined grams per ton.

Converting the extracted ore to platinum and the associated metals that are contained in the reef, require complex chemical and metallurgical engineering processes. The lead - time to unlock the metal in the 1970's was on average 14 months. This has been reduced to approximately 6 months currently. Research and Development is continuously aimed at reducing the lead - time.

The organisation included in this study spends a considerable amount of money on research and development of other markets for platinum (the increase in the platinum jewellery market is of note). The main application of platinum is in auto catalysts although household appliances and computers for example also contain platinum. Competitive advantage does not only have an external focus, but an internal focus as well.

According to OTI Consulting (2007) competitiveness functions in five main areas:
• The core culture comprising of shared vision, mission, values and goods (internal and external focus).
• Customer focus through value propositions and service charters (external focus).
• Competencies development through knowledge, skills, habits and attitude (internal focus).
• Capacities development through structures, processes and systems (internal focus).
• Capabilities are developed through business offerings and strategies (both internal and external focus).

From an internal perspective the organisation included in the study shares information on competitiveness on various management and Union forums in a structured process that takes place every two months. Operational units share information monthly.

The organisation included in this study has implemented the full SAPR3 management formation system to improve effectiveness. The financial reporting system has been reduced with 14 days through a financial management information system that enables completion of financial statements at the first day of every month. The service departments that complement mining have Service Level Agreements (charters), which drive performance and are reflected in individual performance assessments.

From an external perspective marketing of platinum globally is undertaken via Johnson-Mathey, a London based organisation. It has been stated that considerable revenue is invested in research and development in platinum user markets. Managing stakeholder equity and interest is a strategic imperative. Specific analyst days are held to attract, communicate with and expose analysts to the operations.

Through operating more efficiently and cost effectively, enhancing competencies, capabilities and capacities with the customer as objective, improved profitability contributes to increased market share potential. This in turn attracts investors and enables the organisation to grow.
2.2.3.5.1.2 Organisation image

The second aspect of organisational competitiveness according to Prinsloo et al (1999) is the image of the organisation. In ensuring a positive image, the company must ensure that investors (prospective investors) have a perception of the organisation that attracts investment.

Ballaw and Maloney (2006) argue that earnings per share, return on investment and economic value added (EVA) have shortcomings in providing an accurate picture of value. Only a third of an organisation's value is reflected in these measures and a bridge that links accounting systems to market value is required. Ballaw et al (2006) suggest that based performance measures and valuation by the market may assist in bridging the gap between traditional accounting and market value. They propose two tools that assist to clarify what drives shareholder returns beside earnings per share growth and changes in price-to-earnings ratio that assess the relationship between share price performance and company strategy:

- Total Return to Shareholders Mapping Methodology, which, in essence reflect the change in share price plus any dividends received during a given time frame. The benefit of this instrument is that it measures the performance of an organisation in absolute relative terms and provides a framework to balance imperatives of managing the present and the future.

According to Ballaw et al (2006) this methodology indicates how well an organisation is creating returns for shareholders by providing a framework to disaggregate the value of the organisation's strategies for scale, operations, growth and financing.

- Scale is evaluating the amount of economic capital invested in the organisation means.
- Operations are evaluated in terms of economic profit, which is after-tax profits less a capital charge which is an indicator whether the organisation's operating strategies are indeed generating either positive or negative results.
- Growth strategies express the organisation's future expectations in three areas: The assumption of a basic return to break-even economic profitability, after tax
profit growth at a nominal economic rate and future strategic advantages or disadvantages.

- Financing strategies are the business' excess cash, dividends, share-issuance, buyback policies or leverage decisions.

The information obtained through these exercises is then utilised to evaluate performance in the above-mentioned areas over specified time periods. Competitive studies with peer organisations, competitors or the market are then undertaken.

The results from these studies are utilised to assess the Chief Executive Officer's success in several ways. Namely changing the business' relative share price through cost cutting, capital expenditure or acquisitions, research and development, brand investment, new platforms for growth, cash accumulation or other strategies. The analysis acts as a performance measure for executives, indicating whether shareholder value has increased or eroded over time, and to gauge market confidence in their strategies (Ballaw et al, 2006).

- The second tool or instrument is the Accenture Market Value Model, which uses the Total Return to Shareholders Mapping Methodology as a framework.

Ballaw et al (2006) base their model on the principle established by Porter in the 1980's that the market is rational and efficient over time. The underlying hypothesis is Market value of debt and equity is equal to the value of the total economic invested capital plus a break-even economic profit.

Ballaw et al (2006) aver that their model adds another corollary to the hypothesis of Porter. It asserts that the market anticipates the growth of break-even economic profit at a nominal economic rate (Growth Domestic Product GDP percentage) and financing strategies are valued in direct proportion to their economic contribution. According to Ballaw et al (2006), their hypothesis reflects two basic accepted factors in the investment community, namely competitive advantage diminishes over time.
and investors expect markets to grow at nominal rates. This suggests that profit and future value premiums are a zero-sum game at the aggregate level.

Barlow et al (2006) propose companies that endeavour to become high performance businesses need to demonstrate differentiated strategies for scale, operations, growth and financing to obtain and maintain higher relative valuations. Strategies can contribute to diminish zero-sum games and contribute to strong shareholder returns.

Trademark strength is another factor that relates to company image. Lee (2006) argues that a trademark helps the public to identify a company. With the economic globalisation, this is an important factor for establishing business abroad due to language and culture differences.

*If A Name Is Wrong No Message will come smooth*

*Chinese Proverb*

Registering a trademark also assists in disputes as a result of infringements of trademark rights. This is not limited to business, but includes intellectual property trademark.

The aspects of service and or product quality (also contributing to company image) have been discussed suffice to mention that in many instances product displays the company image for example cars (Mercedes Benz or BMW).

Windrum and de Berranger (2003) postulate that the introduction of intranets and extranets facilitated improved communication between client and business resulting in improved competitiveness (new products or services, speed of delivery and efficiency). The use of information technology contributed positively to company image due to quick access and on-line business.

The Wikipedia Free Encyclopedia (2007b) describes corporate image as how a company is perceived. Since image is based on perceptions, it must be managed. In product or service supply this is usually a marketing function especially if the product or service is a branded name associated with the organisation. Organisations in
products and or services markets deal with customers who have a perception of the business. A wrong perception (image) can result in decline in business and customers once lost are hard to regain. Simpkins (2007) argues that the younger generation that enters the business does not have organisational values, care and reputation at heart. This is a potential threat to organisations relying on image.

The Wikipedia Free Encyclopedia (2007b) states that good corporate image can be viewed as the sum of all the images associated with the organisations individual product positions. Corporate name (identity) and logo will support the corporate image.

Simpkins (2007), postulates that the best method for evaluating the sustainable image of an organisation is with direct contact, either personally or by telephone. Organisations in products and/or service markets deal with customers who have a particular perception of the business. A wrong perception (image) can result in decline in business and customers once lost are hard to regain.

The role of Corporate Governance in company image cannot be over stated. The Enron and Parmalat disasters are typical examples. Corporate Governance has its origins in the Turnbull report, which was issued at the London Stock Exchange in the United Kingdom (1999). The report is a guide to internal control which acts as guidance for directors on the combined code. The aim is to ensure that all companies listed and trading on the London Stock Exchange have in place adequate systems for internal control in order to facilitate the management of business risks (Smart, 2000).

In addition, IT Governance (2003), states that the financial sector also have to comply with Basel 2 operational risk management guidelines. This is compliance with ten principles of management and supervision of operational risk. Within an information technology framework, measures that assess, control and monitor operational risk are integrated with an organisation's overall risk and information management strategy.
According to Smart (2000) the boards of companies adopt the Turnbull Report follow a risk-based approach to establish sound systems of internal control and processes to review its effectiveness. These are incorporated into the company’s normal management and governance processes. Boards of directors are also required to regularly examine management reports on the effectiveness of internal control systems. Annual assessments are conducted for purposes of making their statements on internal control in annual reports.

According to Investec (2007) which is a dual listed company in South Africa and the United Kingdom, good corporate governance forms the corner stone of their sustainability strategies and promotes the highest standards of corporate responsibility based on regulating and legislative requirements.

The identified areas of governance are:

- **Board of Directors** who are responsible for measuring strategy, establishing risks and risk tolerance as well as measures for control and monitoring. All directors are subject to performance evaluation with open declaration of remuneration.
- **Management succession plans**, internal controls and formal risk management are formalised and evaluated.
- **A communication and stakeholder strategy** build relations and ensure sharing of information.

Since organisations function on information and data, the information technology aspect of a business, intellectual capital and project governance which contribute to market value, need effective governance measures. This is not only from a security concern, but also need to be aligned with corporate strategies and ensure expenditure is appropriate for business requirements (it Governance, 2003).

The Corporate Governance Framework Research Institute (2007) (CGF) identifies twenty areas of corporate governance:
Business reporting according to CGF (2007) is also being transformed to a worldwide standard for publishing, exchange and analysis of business reports. CGF (2007) ascertained that the extensible Business Reporting Language (XBRL) system enables standard norms in data for business and financial data in digital format. This ensures quick access globally, reduces costs, increase efficiency and as a result the inflow of capital through investments increase due to transparency and visibility of business and financial data for preparers and consumers (stakeholders). The image of the company is thus greatly enhanced.
Besides being listed on Stock and Securities Exchanges nationally and globally, using e-commerce and e–business for reporting technology, company image is also enhanced through awards from financial and auditing institutions (Ernst and Young, Deloitte and Touche). Awards are accorded for performing on the stock exchange, financial reporting and good corporate governance. This not only reward efforts, but contributes significantly to the image in the investment community.

2.2.3.5.1.3 Business Ethics

An additional factor that contributes to company image is conducting business in an ethical manner. All professional bodies that govern professional careers have rules of conduct as well as for ethical business practices. The Law society, Medical Councils and Council for Chartered Accountants have strict codes of conduct that regulate ethical behaviour and practices for members.

The recent Saambou and Fidentia debacles emphasized the issue of ethical business practices when conducting business. Although omitted in the initial World-Class Model, Slabbert et al (2003) argue that ethical business practices reside firmly within the joint governance structure in the world-class organisation. Malan (2003) states ethics in the business context is associated with sustainability of the organisation. Sustainability is discussed in the following section where organisational competitiveness is discussed and forms part of business results.

Ethics is closely associated with corporate governance and is formalized for companies that conduct business on the Johannesburg Securities Exchange as well as abroad in a few instances (London and Paris Stock Exchanges). Malan (2003) postulates that business ethics is based on the belief that an organisation does not function on its own but also impacts on the external environment and stakeholders who may be share holders and or communities. Although responsible for financial results, managers of companies realize that this is not the only criterion for business success. The triple bottom line is the new measure for business success that will be discussed in the following section.

Business ethics can be described as how the goals and activities of the organisation are applied through personal norms. The business environment poses its own
unique challenges to the moral individual who acts as the agent of the system. Malan (2003) states four approaches in the study of ethics.

- The first refers to consequence-based theories, which assert that the consequence of an action determines whether the action was right or wrong.
- The second refers to principled-based theories where predetermined rules or principles determine whether the action is right or wrong.
- The third is described in terms of virtue-based theories. Moral behaviour is the result of a well-formed character and actions are judged according to the character and not the actions of the agent(s) of the system.
- The fourth refers to narrative-based theories, which originates in the different religions in the world teaching what is right or wrong.

According to Malan (2003) the concept of business ethics was formalized in the King 11 report on Corporate Governance. There is an inherent potential of conflict between balancing the long-term viability of an organisation with short-term competitiveness and financial performance hence the triple bottom line measurement of performance.

Malan in Slabbert et al (2003) distinguishes five different levels of business ethics:

- The first level is the individual level where for example behaviour is based on honesty and individual do not accept bribes, commit fraud or absent themselves due to sickness when one is in fact not ill.
- The second level is the organisational level where the organisation requests individuals to commit unethical acts to obtain for example divisional bonuses.
- The third level is at the Association level where one has to refer to the charter of an association for conducting business.
- The fourth level is the societal level where society is governed through laws, norms and traditions which governs behaviour.
- The fifth and final level is on the international level for example the European Union that governs nations and countries associated with the Union.
Longstaff (1999) notes that ethical conduct, not just from management but from directors as well, transmit a message that striving for what one wants to be or become, matters.

The King 1 and 11 reports firmly confirmed South Africa as a leader internationally with regards to ethical business practices. Ethical business practices reside firmly within Corporate Governance and sustainable development, which are prerequisites for example for reporting when listed on the Johannesburg Securities Exchange.

Since ethical behaviour is required from management and employees, ethics influence the employment relationship internally and relations with stakeholders externally. Considering the definition of organisational culture as the way things are done, ethics is ultimately reflected in the organisational culture.

Image is a strategic imperative for organisational sustainability. Through strategies, measures and monitors, compliance to corporate governance and business reporting, the image of the company as a responsible employer and a value for investment is enhanced. Since ethical behaviour is required from both management and employees, ethics influences the employment relationship internally and the relations with stakeholders externally, which has an impact on competitiveness.

Competitiveness is about winning and is achieved through both external and internal strategies that adopt a value creating position in the market for product and or services. Price, value, products and services as well as company image collectively contribute to sustain competitiveness in the long term.

2.2.3.5.2 Profitability
Profitability is the final component of business results and completes the World-Class Model. Two aspects are closely associated with and influence profitability namely competitive advantage and profits.

Competitive advantage has a long-term focus according to Porter (1985) and is the result of thoroughly created strategies and measures. Profits are expressed as
advantages, gains or benefits in monetary terms and reflect the net income, which is established by calculating total earnings less expenses (Porter, 1985).

Porter (1985) argues that for long-term profitability, the attractiveness of the industry is a key element in choosing competitive strategies. Another aspect that relates to profitability is the choice of an organisation’s competitive position relative to its competitors in an industry. An organisation can influence the market or industry and its competitive position through choice and application of strategies for competitiveness. This explains why some organisations are more profitable than others in the same market or industry (Porter, 1985). It has been stated that industry attractiveness is the first determinant of organisation profitability.

All markets and industries have rules of the game. Organisations competing in markets or industry play by these rules and shape the rules as well. Porter (1985) postulates five competitive forces that influence these rules namely 1) entry of new competitors 2) threat of substitutes 3) the bargaining power of buyers 4) the bargaining power of suppliers and 5) the degree of rivalry amongst existing competitors. These five forces determine industry profitability in terms of costs, price and the investment of organisations in a market or industry. The return on these investments is an indicator of profitability.

In the platinum market substitutes for auto catalysts (contains platinum) are constantly researched. If the price of producing platinum for auto catalysts can be maintained below the costs of research and development of prototypes, the future of the metal is assured. Costs and price play a significant role in this instance.

The pharmaceutical industry in South Africa is also worth mentioning since the regulation of medicine prescriptions resulted in the availability of more generic medicines on the market at a cheaper price. This influences the structure of industry. Porter (1985) states that the five forces mentioned are a factor of the industry structure and may vary depending on the nature of the industry. Competitive strategies may act as a double edged-sword. New products for example may give an organisation more competitive advantage and financial gain, but may change the structure of the industry in the long run. Porter (1985) argues that industry leaders
may forfeit short-term wins in order to protect industry in the long term. This requires a balancing act.

The second aspect of industry profitability according to Porter (1985) is industry structure and buyer needs. Profitability is closely related to value. Porter (1985) argues that the organisation needs to capture the value it creates for buyers and industry structure determines who captures the value. New entrants into an industry or market may diminish value through lowering prices whilst raising the stakes for competition.

Porter (1985) argues that buyer power is determined by the extent buyers are able to retain most of the created value for them. Likewise, the power of suppliers determines the extent to which value created for buyers will be appropriated by suppliers rather than by organisations in an industry. This gives rise to rivalry and whether organisations can manage the value they create for buyers amongst themselves, resulting in either lower price for buyers but increasing costs for competing. According to Porter (1985), industry structure determines who keeps which proportion of value of a product or service that is created for a buyer. If little value is created for a buyer of a product or service, there is little value to be captured by firms regardless of the elements of the industry structure. If high value is created, the industry structure becomes crucial. Porter (1985) also argues that industry structure is a balance of supply and demand. Industry structure underlies long-term profitability although fluctuation in supply and demand may affect profitability in the short term. Imbalances may occur in supply and demand due to constant change but adjust accordingly.

Intense rivalry will affect how firms perceive their market position and adopt strategies accordingly. This may include investing into expanding capacity or maintaining profitability. Industry structure consequently influences supply and demand balance and the time period of imbalances (depleting excess capacity). Excess capacity in some industries result in price wars that lower profitability.

In other industries there are structural pressures for intense rivalry for example the food and beverage industry. Costs, price and buyer demand are significant factors
playing a role. In drill bits for underground operations costs to mine versus price of product, degree of rivalry amongst suppliers in a relatively closed market (coal mines) play a significant role in profitability for both the mine and supplier of drill bits. Quality of drill bits and yield (cost of drill bit versus the production achieved as well as life of the drill bit) determine buyer demand.

In economic down curves, powerful suppliers or the availability of substitutes can mean that the effects of the down curve be absorbed by the supplier or passed on to the buyer or, in severe circumstances share the effect between supplier and consumer (buyer). These strategies protect industry in the long term.

Porter (1985) offers three generic strategies for competitive advantage that compliment the second aspect of profitability relating to the choice an organisation can exercise in terms of position relative to competitors in an industry. The three strategies are: 1) cost leadership 2) differentiation and 3) focus which all offer different routes to competitive advantage.

Porter (1985) postulates that cost leadership and differentiation strategies seek acceptable advantage in broad industry segments, whilst focus strategies aim at exploiting cost advantages or differentiation focus in a narrow segment. The specific actions to affect these strategies also vary from industry to industry as well as within industry. Since competitive strategies are at the core of any industry, these generic strategies underpin the competitive advantage(s) that are being sought. These require choices to be made when the competitive position of an organisation is considered in terms of creating and sustaining a competitive advantage. Firstly cost leadership is a strategy that is pursued to become the lowest cost producer in an industry and depends on the structure of the industry. According to Porter (1985), the pursuit of economies of scale, proprietary technologies as well as preferential access to raw material are factors for consideration.

The pressure on a platinum mine to be a low cost producer has been discussed previously in the section dealing with costs.
Porter (1985) argues that a cost leader cannot ignore differentiation if he/she wants to attain parity or proximity relative to their competitors. If a product or service is perceived not to be comparable or acceptable by buyers, cost leaders may have to discount prices below competitors to increase sales. This may erode their cost position. Porter (1985) describes proximity in differentiation as the price discount required to achieve an acceptable market share, which is not offset against a cost leader's cost advantage resulting in earning above-average returns. Unless major technological inventions allow a company to change its cost position, cost leadership is dependent on pre-emptive strategies, hence Porter (1985) warns against non-cost leaders adopting a cost leader strategy since rivalry may result in disaster.

Differentiation is the second generic strategy that may be applied when an organisation seeks to position itself uniquely in the industry selecting attributes that are valued by buyer(s). Differentiation can manifest itself in terms of product, service, marketing strategy and the delivery system. In the case under study, the external stakeholder, African Explosives Ltd. (AEL) is unique in terms of product variety (explosives for various mining conditions), service and delivery.

Porter (1985) postulates that, as a differentiation, a company must seek ways of differentiating that lead to a price premium that is greater than the cost of differentiating.

\[
\text{Differentiating} = \text{price premium} > \text{cost of differentiating}
\]

Premium price depends on uniqueness. The uniqueness of a firm, product or service is key to a differentiation strategy. Once uniqueness has been established, then price premium can be expected.

The third generic strategy is focus, which concentrates on the selection or choice of a segment within a group of segments within the industry. Service is exclusively aimed at the selection to the exclusion of others. Two variants are distinguished within a focus strategy; costs and differentiation (Porter, 1985). Cost focus exploits differences in cost behaviour in some segments by exploiting the special needs of buyers in certain segments of the industry. When a continuous stream of value-creating activities, products or services for both suppliers (upstream) and channel members (downstream) are created which cannot be imitated by other organisations,
a competitive sustainable advantage is created. Developing and implementing strategies of building and sustaining competitive advantage is thus actively pursued. A focus strategy according to Porter (1985) that results in above average performance in an industry is achieved through sustainable leadership (cost focus) of differentiation (differentiation focus) in a segment(s). The condition though is that the segment(s) is structurally active.

A second aspect is managing and developing three core assets, organisational and managerial process, positions and paths that assist to build a sustainable competitive advantage. The Wikipedia Free Encyclopedia (2007b) define these three assets as 1) Organisational and managerial process 2) positions and 3) paths.

**Organisation and managerial process** are characterized by coordination and integration amongst teams and across departments, which create synergy and focus. These are prerequisite for value creation and a key to the survival and success of an organisation. The collecting of information, disseminating and interpreting of information as well as responses to markets, environment, legal and government restrictions are all aspects that affect production and services. Through reconfiguring and transformation, the changing environment is proactively translated into the organisation. This facilitates innovation, which affects the position of the organisation.

**Positions** in the market are technological, financial, reputational and structural by nature. Technological assets can be equipment, information technology, formulas, processes and brand. Financial assets refer to financial base (cash, debt and equity). Reputation assets refer to product, service and position in the market. Structural assets refer to how well the organisational structure facilitates performance. The organisational hierarchy influences culture, procedures and routines.

**Path** is characterised by two aspects namely path dependencies and technological opportunities. From inception an organisation has specific orientations. The directions of a path taken determine how competencies are developed.
Technological developments determine how organisations exploit opportunities to build a sustainable competitive advantage.

Since Thomas (2004) argues that a distinct difference between profitability and profits exists, it warrants a closer examination of the two concepts from a measurement perspective. Measuring profitability reveals performance in financial terms, which may be analysed further and reflect efficiency and performance. Profit is an absolute term, which is reflected on the bottom line of a financial statement and is calculated as the total income generated less operating expenses. According to Prinsloo et al (1999) net profit is profit less tax and is a pure financial figure that reveals financial state and not profitability.

According to Hofstrand (2006), the income and expenses, which is utilised to calculate profitability originates from the income statement of a business through listing of income and expenses. Profitability can be used reactively and proactively. Reactively, profitability is measured over a period in the past until the end period of the income statement. Proactively, a pro forma income statement for a specified period in future can be derived to determine organisational profitability.

According to Hofstrand (2006) measuring profitability is the most important measure of the success of a business. Low profitability threatens survival whilst highly profitable businesses have the ability to reward owners with large returns on their investments.

Hofstrand (2006) warns against the assumption that profitability means healthy cash flow. Whilst an income statement shows profitability, cash flow reveals liquidity of the business. Liquidity is associated with the ability to convert assets into cash needed for the day-to-day operating of a business. Salaries and accounts (debt) have to be paid and this is paid through cash according to Longenecker et al (2003).

Prinsloo et al (1999) offer two measurements for profitability. Firstly return on total assets as a percentage is calculated by dividing earnings before tax and secondly
interest by net operating assets times one hundred. This indicates an organisations’ performance to industry norms according to Financial Management (2007).

Secondly return on total equity is used to compare the performance of two similar organisations for example competing in an industry. It reveals the rate of return that owners earn on their investment and is calculated as net income divided by common equity.

\[
\text{ROE (return on equity) = \frac{\text{net income}}{\text{Common equity (owners equity (interest) stock}}}
\]

Prinsloo et al (1999) propose the calculation of cash generated for a specific period (financial year) that indicates the liquidity of a business. An additional measure to compare companies in a similar industry according to Answers.com (2007) is profit margin. Profit margin (profitability) can be expressed as net income divided by revenues:

\[
(\text{Profit Margin (profitability)} = \frac{\text{net income}}{\text{Revenues}} \quad \text{or} \quad \frac{\text{net profits}}{\text{sales}})
\]

This is also a measure of how financially healthy a company is in the industry and is an indicator of a business' pricing policies and its ability to control costs.

According to The Wikipedia Free Encyclopedia (2007c), profit margin is an indicator of a business' pricing policies and its ability to control costs. Related to profit margin is the concept of profit rate which is the rate of return achieved by the rate at which stock is depreciated and the rate at which the production process repeats itself (turnover). Rate of return is improved by either increasing the profit margin or by quicker turnover (shortening production cycle or selling more products). These measures assist to examine a business from a profitability point of view from both a historical and anticipated future perspective. It is profitability and not profits that attracts or discourages potential investment.

2.2.3.6 Implementing the world-class organisation
Organisations differ in their existence and getting to world-class will not mean having a universal blueprint to achieve world-class status. Prinsloo et al (1999) however propose a generic four-phased implementation approach.

- Mobilisation and benchmarking
- Planning and prioritisation
- Implementation and
- Continuous improvement.

The implementation is proposed in the following figure:

<table>
<thead>
<tr>
<th>PHASES</th>
<th>PHASE 1 Mobilisation and benchmarking</th>
<th>PHASE 2 Planning and Prioritisation</th>
<th>PHASE 3 Implementation</th>
<th>PHASE 4 Continuous Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main elements of each phase</td>
<td>Mobilisation</td>
<td>Develop / review Mission Statement</td>
<td>Re-affirm management commitment</td>
<td>Plan</td>
</tr>
<tr>
<td></td>
<td>Benchmarking</td>
<td>Key Performance Intervention</td>
<td>Remove the obstacles</td>
<td>ACT</td>
</tr>
<tr>
<td></td>
<td>Case for change</td>
<td>Short-term wins</td>
<td>Training and Development</td>
<td>DO</td>
</tr>
<tr>
<td></td>
<td>Stakeholders Involvement</td>
<td>Detailed action plan</td>
<td>Monitor Scorekeeping</td>
<td>CHECK</td>
</tr>
<tr>
<td></td>
<td>Communication Strategy</td>
<td>Organisation Design/Redesign</td>
<td>Feedback Sessions</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 – 26: Implementation approach to world-class status (Source: Prinsloo et al, 1999)

Prinsloo et al (1999) propose a project team within the organisation that will transform the organisation to world-class status. A management of change process is suggested to transform the organisation. A four-phased approach is proposed:
• **Phase 1 Mobilisation and benchmarking**

Three prerequisites must be addressed for the successful transformation of an organisation to world-class:

• preparing the organisation for change

• conducting a benchmarking exercise

• preparing a case for change

• Preparing the organisation for change requires mobilising through sensitising all employees of the change, crises or impending crisis. Communication and education of the realities need to be undertaken and all stakeholders must be informed. The need for change and the urgency to implement the changes in order to be competitive and profitable for survival is established.

Benchmarking involves mobilising employees and through their participation, management and stakeholders conduct a gap analysis. The current realities are established and inputs made towards the envisaged future state. World-Class Model components are used for quantitively benchmarking and focus groups that use various techniques for example the nominal group technique conduct the benchmarking. All inputs from participants together with concerns and recommendations as well as the results from the benchmarking exercise are utilised for the in house working document that will form the ‘case for change’.

Step 3 entails the rationale for the change process to transformation and is the final step in the mobilisation process. The internal and external business challenges are reflected in the ‘case for change’ document and addresses the competitiveness of the organisation, the required future performance to remain competitive, the performance gap between current realities and future requirements and consequences for maintaining the status quo.

The ‘case for change’ document must meet the following success criteria:

- People must be energised for renewal and improvement

- Possible rationalisations must be addressed
• A communication strategy that will address needs of employees at the various levels must be compiled

• A clear articulated vision of the organisation of the future and if required

• A negotiated agreement with all stakeholders regarding the changes in the form of a social plan over and above agreed retrenchment agreements.

• **Phase 2 Planning and prioritisation**

  This phase concentrates on the ‘case for change’ document and is analysed and discussed between management and the respective identified stakeholders. The outcomes are solutions driven.

  • **Mission statement renewed or developed**
    
    The mission statement reflects the road map of the future of the organisation and is aligned or developed after phase one and the appropriate strategies, actions and budgets to affect the changes identified. Leaders create the vision and the logic of how the vision should be achieved and management create the plans, actions and projects aligned to financial goals and measures. Frequently the managers and leaders are the same people.

  • **Key performance drivers and measures**
    
    The key performance drivers that were discussed in 2.1.6 above need to be identified to transform the organisation to world-class status.

  • **Action plans**
    
    Action plans reflect the improvement projects and are divided into short term wins and detailed action plans. The short - term wins create the momentum for change and establish the new behaviours required for long - term success. Action plans contain objectives, milestones, due dates and responsibilities for achievement.

  • **Organisational redesign or design**
    
    Where the organisation needs to be redesigned, the specific end goals (ends planning) are considered and planning backwards affected. Once new strategies
have been decided, the structure and support systems (remuneration, performance management, information systems) in the organisation are designed to give effect to the strategies.

- **Phase 3 Implementation**

During phase 3 the actions derived in phase 2 are implemented. Depending on the situation at hand various approaches to implementation are followed. Structural changes are usually top-down approaches whilst information systems might take a bottom-up approach. Depending on the nature of the change and size and geographical spread of the organisation, a decision is made to pilot a project on a site or affect organisational wide implementation.

Prinsloo et al (1999) offer five steppingstones to successful implementation:

- **Re-affirm management commitment**

Management must articulate and behave according to the requirements of the changes envisaged. Through approving action plans and allocating resources (budgets, time and people) management will affirm the changes to employees.

- **Removal of obstacles**

All stakeholders need to remove barriers to performance. A soft consultative process is proposed and not a hard courageous decision that will alienate employees. Unresolved employment relations issues, people resisting change, organisational structures and systems need to be aligned in this phase.

- **Training and development**

The provision of the skills and training of people to their new roles goes without saying. Sufficient budgets need to be resourced; world-class organisations spend approximately 7.5% of operating expenditure on training and development. Continuous improvement requires continuous development of people.

- **Monitoring and scorecard keeping**

The development of the balanced scorecard has been discussed and is the preferred method of keeping track of progress.
• **Feedback meetings**
As a result of the change process and the business results, all stakeholders need to be informed continuously of progress made. A detailed communication strategy is proposed that would address various means and methods of communication. Feedback keeps people focused.

• **Phase 4 Continuous improvement**
Changes that have been implemented have to be sustained. Continuous improvement means that the principles of sustainable development have been discussed. Continuous improvement is based on four activities namely plan, do, check and act which is depicted in figure 2-26 below:

- **Plan**
  Plan: Understand and measure critical success factors
  Search: Research appropriate organisations for process comparison (benchmark)

- **Do**
  Observe: Monitor performance and analyse performance gaps
  Analyse: Determine the root causes for performance gaps

- **Check**
  Adapt: Select best practices and modify for organisation

- **Act**
  Improve: Enhance and integrate business process improvement

**Figure 2 - 26 Implementation Approach to World-Class status**
(Source: Prinsloo et al, 1999)

Successes must be celebrated. Not short term wins but long enduring changes and results. This maintains momentum for the change process and acknowledges contributions.

World-class organisations embrace the world-class principles into their organisations through leadership and uncompromising focus on quality and customer service. Best practices support this focus, which requires employment relation strategies for people behaviour in company context. Commitment is fostered through the
establishment of psycho-social contracts over and above the normal legal contract of employment. This is underpinned by shared values and a belief system that represents the culture in the organisation. A high performance culture embraces change and transformation that improves business performance to the benefit of all stakeholders.

2.3 The Safe Human Mindset Model

2.3.1 Introduction

The Safe Human Mindset Model (developed by Schutte 1998) postulates that a workforce mindset is fundamentally shaped by credible relationships within a climate of competitiveness where employees contribute to the achievement of organisational goals where a sense of pride and accomplishment is established. Within a safe working environment the physical environment and safety intent are the two most important factors contributing to a climate conducive to safety and supported by culture consisting of a set of common values and beliefs.

Figure 2 – 27: The Safe Human Mindset Model (Source: Schutte, 1998)
Bendix (2001) argues that a constructive work climate is created through cooperation based on trust where the involvement of employees is supported by joint problem solving. The creation of a safe working environment where employees contribute freely is therefore an Employment Relations imperative. The relationship credibility is characterised by trust, support, respect and ownership, which according to Schutte (1998) is of fundamental essence in determining and shaping the workforce mindset.

Attitude towards the job and company contribute to specific behaviour as part of the perceived climate. The two safety dimensions consisting of physical work environment and safety intent explain behaviour as part of the perceived climate. Values are indicative of what safe behaviour on the part of employees is designed to accomplish. Beliefs provide the control and reality in which safety-behaviours occur.

In conclusion the current organisational climate as perceived by employees directly influences the future values and culture (the way we do things here). The organisational climate however is dependent on the perceived relationship credibility shaping the mindset of the workforce since it portrays the caring character at the workplace.

2.3.2 Relationship credibility

According to Schutte (1998), relationship credibility embraces the trueness of the work relationship and the inherent caring character that bonds individuals as a team and moulds or shapes the workforce mindset or motivational intent. A well-developed credible relationship is reflected in a mature and true work relationship that harmonises and synergises worker energy and effort constructively which is conducive to safe, qualitative and productive behaviours that contribute to growing workforce responsibility and accountability. Fundamental to relationship credibility are the key factors of trust, support, ownership and respect.

2.3.2.1 Trust

Schutte (1998) describes trust as the true nature of honesty, openness, sincerity, reliability and acceptance that make people feel relaxed and unguarded amongst each other. Maritz (2003) associates trust directly with a leadership attribute and
defines trust as a positive expectation that another party will not - through words, actions or decisions - act opportunistically by violating any of the various dimensions of trust namely integrity, honesty, openness, competence, consistency and loyalty.

Three types of trust are distinguished namely deterrence-based trust, knowledge-based trust and identification-based trust.

- **Deterrence-based Trust**
  One violation or inconsistency destroys the relationship and works only to the degree punishment is possible, where consequences are clear and punishment is imposed if trust is violated.

- **Knowledge-based Trust**
  Knowledge-based trust is based on the predictability of behaviour, which originates from a history of interaction. Knowledge of the other party and predictability of behaviour form the foundation. In organisational context most manager-employee relationships exist because both parties have sufficient knowledge to know what to expect from one another.

- **Identification-based Trust**
  This level of trust is achieved when there is emotional connection between the parties. Parties understand each other’s intentions and appreciate needs and wants. Control is limited.

Whitener (1998), comments that organisational success depends on interpersonal trust between leaders and subordinates. Trust has significant relationships with other organisational variables e.g. quality of communication, performance, citizen behaviour, problem solving and co-operation. Trust reduced the need for formal contracts, limits opportunistic behaviours and reduces the need for hierarchical control.

Shockley-Zalabak, Ellis and Cesaria (2000) argue that trust is more than a social issue. It is an economic imperative for business resilience in the global marketplace. The ability to build trust relationships in the organisation and outside is a predictor of effectiveness. Shockley-Zalabak et al (2000) distinguish five factors that create organisational trust:
- Competence (co-workers and leaders' effectiveness)
- Openness and honesty (amount, accuracy and sincerity of information shared)
- Concern for employees (exhibit empathy, tolerance and safety)
- Reliability (consistent and dependable actions) and
- Identification (sharing common goals, values and beliefs)

Prewitt (2003) argues that organisational learning can only take place in a trusting work environment. This trust is based on care. High degrees of care build trust and openness. Schutte (1998) states trust is supported by rewards, allowing viewpoints, empowerment, feedback, honesty, sincerity and courage.

2.3.2.1.1 Rewards

Rewards refer to both intrinsic (sense of accomplishment) and extrinsic (financial) rewards. Schutte (1998) refers to intrinsic rewards as a sense of accomplishment and extrinsic rewards as financial benefits. Burger et al (2003) describe intrinsic rewards as those feelings that motivate an individual from within and relates to task accomplishment and belonging to a team. Extrinsic rewards are rewards that are expected for doing something in return and include monetary and non-monetary value.

In organisational safety context certificates for achievement and bonuses are examples of both intrinsic and extrinsic rewards. Thomas (2004) argues that extrinsic rewards are important in the short term but employees need intrinsic rewards for optimal performance in the long term. The challenge is to make the work so enriching and energising that workers want to remain. Intrinsic rewards that stimulate the work environment include sense of choice, sense of competence, sense of meaningfulness and sense of progress.

2.3.2.1.2 Allowing viewpoints

Schutte (1998) describes allowing viewpoints as the degree to which different employees are listened to, suggestions recorded and implemented in a caring and respectful manner that creates a sense of innovativeness. The ability to listen is the associated skill that will enhance intrinsic rewards. In the South African context, the
Mine Health and Safety Act 29 of 1996 prescribes employee inputs in health and safety issues through statutory employee representative structures through which employees can express their views and contribute to workplace safety.

Sherman (2001) declares that employee compliance to safety is greatly enhanced when employees have the opportunity to voice their opinion and provide inputs into the system. Once this is achieved employees can be held accountable for safety. O’Grady (2000) states that joint working committees on safety need problem solving skills to enhance its shared interest. Barling and Frone (2002) distinguish between two types of safe behaviour. The first is compliance (to rules and standards) and the second is participation. Participation in the larger organisational context refers to contributions in safety committees (where the larger organisation is assisted) contributing to a safety climate (policies, procedures and practices). According to Quality Management Services (2001) conversation is the mainstay of safety. Conversation is a human mechanism for getting control back. Through conversation meaning is created. Allowing viewpoints therefore assist the organisation on a larger scale than just the individual level where safety is concerned.

2.3.2.1.3 Empowerment

Empowerment was addressed at length under the subsection on the leadership aspects earlier in this chapter. Schutte (1998) describes empowerment as meaningful, respectful and continuous involvement of subordinates and teams in job and safety-related matters that affect them.

Barling et al (2002) report that empirical studies conducted by Hechanova-Alompay and Beer (2002) as well as Simard and Marchand (1995), confirm that greater team self-management is related to safer working environments. This includes an established participating approach to safety where supervisors and employees have joint involvement in safety related issues. Work groups contribute more to safety through anticipating hazards, making suggestions and putting pressure on management to make safety improvements.
Johnson et al (1998) argue that engagements in discussion regarding aspects of the work lead to empowerment. Discussion is actively engaging employees in all work related issues through sharing information. In a unionised environment discussion must lead to the cooperation and agreement of the workforce. This is elicited through a process of allowing viewpoints. Sutherland et al (2000) argue that commitment is generated through a process of participation.

Any relationship of power is legitimate if the aim is the empowerment of the subordinate

Axiom 2 - E. Schuitema

Robbins (1996) states that empowerment is a result of reshaping the relationship between managers and employees through participation and delegation while Sutherland et al (2000) propose the behavioural approach to improving work-place safety as a step to real empowerment. By taking responsibility, employees have autonomy and responsibility. This commences with the way employees are managed.

Empowerment is the incremental suspension of control

Axiom 3 - E. Schuitema

Schuitema (2004) advocates the growth of employees through providing means, ability and accountability. When accountability is achieved, employees are empowered. Sherman (2001) postulates that commitment to safety is achieved when management walk the talk and actually keep people accountable through making safety part of their job and involving them in what they are accountable for.

According to Page (2002) the Australian provisions for worker health and safety promote empowerment through legislation that seeks active worker involvement. Employees are empowered to challenge management prerogatives through a system of co-regulation. The various States in Australia have autonomy over legislation and not just Central Government. For instance, New South Wales (State) have provisions for labour unions to prosecute.
Whether empowerment is a statutory requirement or a management approach, employees are only empowered when they are held accountable for acts or omissions. This is achieved through the provisions of means to do the job and ensuring that employees have the ability to perform the work.

2.3.2.1.4 Feedback

Schutte (1998) describes feedback as the free flow of credible and relevant information, which may be either positive or negative but is used to add value in the future. When information is shared in a transparent and caring way, trust is earned and enhanced. The role of feedback is to involve, empower and grow people honestly and continuously. Feedback as a tool is also applied to encourage employees to participate and to elicit ideas provided sincere appreciation for ideas and efforts are shown. The skill to apply is active listening through showing respect and responding honestly.

Fern and Alzamora (2006), state that employees continually engage in potentially safe and unsafe behaviours. The more quality feedback employees receive the greater are the chances they will adjust unsafe behaviours whilst continuing desirable behaviours. A 360-degree approach is proposed between managers and employees, employees and managers, peers and well-respected peer safety leaders. Training in giving and receiving feedback as well as building multidirectional feedback enhances employee behaviour adjustment. Allowing employees greater input into feedback increases ownership and sense of control (Fern and Alzamora, 2006).

O’Dea et al (2003) report that studies by Kivimaki et al (1995) confirmed that feedback was associated with good safety performance, especially where it was associated within the communication process and management time spent on the workforce. Feedback in the interaction between managers and employees acted as a source of motivation for employees. Feedback also stimulated the worker involvement process, which resulted in more involvement in the decision-making process that was evident in the top performing United States of America Companies (O’ Dea et al, 2003).
Cooper (1999) argues that feedback is the key ingredient to any performance initiative through regular focused feedback about on-going performance. In a behavioural based safety system feedback consisted of three forms 1) verbal feedback at the time of observation 2) graphical feedback on large graphs placed in strategic locations in the workplace and 3) weekly and monthly briefings about specific behaviours assisted to overcome apathy and allowed focused improvements to take place. Feedback is an integral part of the behavioural safety system where individuals shared feedback on performance with peers. Feedback also assisted to transfer shared learning.

In a performance management context, Carman (2006) argues that goal consensus between superior and subordinate is a prerequisite for building trust. Trust sets the scene for an employee to receive effective feedback. Trust lowers the defences thereby assisting the receiver of the feedback to accept what is being fed back. In organisational context this is imperative since safe production is in the Individual Performance Assessment of all leaders and specific goals and objectives are set with regards to safety.

2.3.2.1.5 Honesty
Schutte (1998) refers to honesty as the consistent reflection of trueness in all behaviour and communication, irrespective of good or bad news. The Canada School of Public Service (2005) argues that trust is critical for risk management since in organisations risk is managed in a group context spread between various individuals. Trust is therefore vested in these individuals collectively. Since people trust their fellow team members, colleagues and superiors in that they would act in accordance with their responsibilities and for the better of the organisation, a breach of trust seriously affects the organisation.

Honesty is closely associated with integrity where honesty is about telling the truth and words are conformed to reality. Integrity is about conforming reality to words or keeping promises. Trust is built when leaders demonstrate competence in reducing uncertainty as far as possible. Honestly keeping people informed assist in reducing uncertainty. Loui (2004) argues that honesty improves self-confidence in moral reasoning that leads to an improved understanding of ones responsibility. Similarly,
Ivancevich et al (1996) conclude that honesty and integrity have special significance for leaders. Honesty refers to being truthful or non-deceitful and both form the basis of a trusting relationship between leader and follower.

Successful leaders are open in communication but do not violate confidences or carelessly divulge potential harmful information. Credibility is the hallmark of effective leaders. Trust is gained by being predictable, consistent and persistent as well as making competent decisions. Rose-Ackerman (2001) argues that honesty is closely associated with trust and implies both truth-telling and responsible behaviour that are rule bound. Honesty varies with trust in that a person may be honest, but as a result of incompetence may not be trustworthy. Interpersonal relationships are facilitated by the belief that the other person has a moral commitment to honesty.

2.3.2.1.6 Sincerity

Lowenstein (2006) argues that loyalty is created through trust relationships, both from employees and customer perspectives. Sincerity and trust are at the centre of partnerships, contracts and relationships. The lack of trust and sincerity lead to low levels of loyalty and commitment. This results in high risk as reported by Lowenstein (2006) in research studies by Walker and Hudson Institutes.

Schutte (1998) refers to sincerity as creating a sense of credibility and genuineness by maintaining honesty or openness and showing emotions. This is reflected in verbal and non-verbal communications, individually and in teams. Rashkow (2005) argues that sincerity is especially important when multinational companies are geographically apart and communication is of a non-visible nature. The use of electronic communications become important and people judge one another within 15 seconds of making contact. One's communication abilities or style thus says a lot about oneself. By being receptive to enquiries and responding quickly one builds trust. Attention to detail in written communication e.g. spelling errors and use of language also builds trust.

Beauty is as beauty does
- Prof. Jane Carr
Keen and Knapp (1995) argue that trust consists of trustworthiness (value) and trustability (skill). Sincerity is associated with the skill part but, to be trusted, both elements are implied. Liteeman and Liteeman (2000) are of the opinion that sincerity is not enough to build trust (mean what you say). A second important aspect is faith in one’s ability to do what one says one wants to do. Sincerity is demonstrated through the ability to act. According to Karagianis (1999), Ray Stata from MIT confided that trust is built on sincerity, truthfulness, competence and reliability.

Cross, (1995) states that true sincerity derives from self-knowledge and courage. One is sincere when one truly knows oneself and what one values, stands for what one believes in and has the courage to act on it. The enemy of sincerity is fear. Fear for failure and rejection. Carman (2006) associates sincerity with giving feedback. If goal consensus and clear expectations form the basis of trust between superior and sub-ordinate, trust forms a pre-condition for the recipient to believe in the sincerity of the provider of feedback.

According to Robbins et al (2003) management care is displayed when people are appreciated for their efforts through sincerity and recognition. Tierney (2005) asserts that employees only buy in when they feel that the company sincerely cares for them. Compassion, sincerity and a safe workplace assist to create buy-in.

2.3.2.1.7 Courage

Courage in literature is associated with leadership. It is the strength to lead in difficult circumstances (not just physical but also psychological). From a Christian perspective courageous leaders are strong and are unlikely to quit (Malphurs, 2003). This kind of courage when displayed in a leader is the willingness to admit a mistake, stand up for beliefs or when others need to be challenged. Schutte (1998) argues a step further and, with regards to the admittance of mistakes, describes courage as taking immediate steps to rectify the situation.

Courage is the assertive acting out of a belief or principle even when one experiences extreme stress or discomfort (The Denver Post 1997). Courage is also associated with love. Love of justice, principle and people. Courageous leaders push through for what they stand for even at their own expense. Clark (2000) associates
courage with leadership and describes courage as a virtue that enables one to conquer fear, danger or adversity, which could be physical or moral. It also includes taking responsibility for decisions and actions and in addition involves the ability to perform critical self-assessment, confront new ideas and to change.

Jackson (2005) identifies courage as a leadership principle and describes courage as the ability to make and stand by difficult choices even when 'knife-edge' choices are to be made. Then, once made, courage is needed to stay the course. Fear is only overcome by courage (Dickerson, 2004). Fear is an emotion appropriate to perceived risk. Courage then is the perceiving of risk and proceeding despite the risk.

**Maturity means being here to give or acting with generosity and Courage**

**Axiom 4 – E. Schuitema**

With regards to courage and leadership, Caruthers (2006) distinguishes between various forms of leadership namely, individual, group, archaic, classical, systemic and soul leadership. Soul leadership requires transcendence of ones own needs for respect, success and recognition through befriending one's own emotions and ego. Once this is achieved, one gets the courage to 'change the world'. Soul leadership acts as a model for leaders. However, courage is not only displayed in individuals, but also in teams.

Klein and Napier (2004) distinguish five acts of courage within teams who perform well under pressure.

- **Purpose** refers to the courage a team has to pursue lofty and audacious goals
- **Rigour** refers to the ability a team has to invent, refine and stick to protocols
- **Will** refers to the courage in a team to inspire hope, spirit and promise
- **Risk** is described as the courage of a team to empower and trust team members and
- **Candour** is described as the courage of a team to speak and hear the truth.

**You must be the change you want to see in the world!**

* - Ghandi
Courage manifests in three spheres namely physical, moral and psychological. Firstly physical courage, according to Putman (1994) is for example a soldier facing death in battle. But courage in this form is displayed when a cause perceived as worthwhile is pursued despite known danger. The opposite exists when a soldier for example shows off or does not perceive the danger. Secondly in moral courage as referred to by Putman (1994), danger is not physical well-being but the social standing, acceptance by peers or the financial situation of the individual. Callimachus (2006) describes moral courage as an ethical construct of approaching the world and the core responsibilities within. The motivation is obtained from pursuing the goal (nobility), which may be justice or respect for human dignity. Thirdly in psychological courage, the fear to overcome is psychological annihilation according to Putman (1994). It takes courage to face irrational fears and anxieties that hold one captive and include habits, compulsions and phobias.

Putman (1994) divides psychological courage into three broad types namely 1) fear of facing destructive habits 2) fear of facing irrational anxieties which control one's life and 3) fear of facing intimate others who keep one in psychological servitude primarily due to an emotional link that the individual is afraid to break.

'A man does what he must – in spite of personal consequences, in spite of obstacles and dangers and pressures – and that is the basis of all human morality'
- J. F. Kennedy

Lewis (2006) identifies four types of trust (Solomon and Flares) namely basic trust, authentic trust, transactional trust and transformative trust. Courage is associated with the latter. It takes courage to transform which is associated with risk taking. Without risk change will not occur. Courageous leaders first set the sample and build commitment and create a trusting environment. It is therefore an inside - outside approach. It is only when trust is established with followers that the leader can lead followers into unfamiliar territory.

Always do right. This will gratify some people and astonish the rest.
It was argued earlier in the chapter that where there are followers, per implication there are leaders. Rice (2005), postulates that leaders and followers are two sides of the same coin since the actions of one impact on the other. The armour of a leader consists of courage and discipline.

'It is a matter of intelligence, trustworthiness, humaneness, courage and sternness.'

Sun Tzu - Art of War

2.3.2.2 Caring Support

Caring support originates from the concept of servant leadership. Parolini (2004) associates four traits with caring leaders namely active listening, understanding, acceptance and empathy, which are all associated with emotional intelligence. As discussed previously, through caring and growing people the leader obtain legitimacy and followers follow willingly (Schuitema 2004). Schutte (1998) describes support as the trueness and substance of practical assistance, guidance, coaching, care, kindness and goodwill experienced by team members in the business. It is thus evident that support can be physical and or emotional.

Practical assistance with completing a job for example installing support or coaching the correct way to drill a hole in a stope are types of physical support. Effective Practices Collection (2003) describes listening as a critical form of emotional support. Emotional support is also associated with monitoring relationships. Care, kindness and goodwill display emotional support. Schutte (1998) associates shared information, transparency, kindness, encouragement, unity, clear guidelines and frontline visibility with caring support.

2.3.2.2.1 Shared information

According Toffler (1984), we are living in the third wave which is the information technology age. The effective sharing of information is assisted through information technology. Schutte (1998) describes information sharing as the way in which facts and figures are made available (how specific the information is, to who it is directed
and the perceived honesty and care during interaction.) Robbins (1996) refers to Minzberg’s identification of key managerial roles of which the informational role is the second. Being a monitor, disseminator and spokesperson are aspects associated with an informational role.

Information sharing is not just aimed at individual level (performance improvement, or creating understanding) or teams (synergy creation) but also facilitates organisational learning (Huber, 1991). In organisational safety context for example the sharing of other incidents and accidents assist in learning and the prevention of recurrences.

**The meaning of a message is the change which it produces in the image**

* - Kenneth Baulding

### 2.3.2.2 Transparency

Schutte (1998) describes transparency as the perceived willingness and commitment to always share facts in a true and understandable manner. Sharing the full picture honestly and providing proof of what is said with full disclosure of reasons for actions and decisions in a respectful manner and soliciting feedback are typical behaviours suggested by Schutte (1998). Walker and Pagano (2005) offer nine behaviours that, when exercised, are transparent leadership which builds credibility:

- Being overwhelmingly honest. Honesty builds trust, even when all the facts are not available to share. This stimulates authenticity. Being honest with subordinates should be displayed with both respect and concern for others
- Gathering intelligence means asking others for their opinion. The 360 - degree performance rating is aimed for example at eliciting performance evaluation from subordinates, peers and superior(s). Self-awareness is needed to learn and grow and is obtained through the input of others
- Being composed means never to loose ones composure, no matter the stress. True opinions and emotions regarding issues require cool heads that builds trust.
• Letting your guard down requires maturity and self-awareness whilst being authentic. Opportunities to engage with followers in order for them to know the leader, promotes authenticity that ultimately describes the quality of relationships.
• Keeping promises mean walking the talk, thereby valuing commitments.
• Properly handling mistakes reveal courage, accountability and humility.
• Delivering bad news well diminishes feelings of betrayal and anger. Bad news, delivered with honesty, directness, care and concern is appreciated by subordinates
• Avoiding destructive comments means simply watch your language. This is not only referred to using foul language but also inappropriate blame, criticism or talking people down and
• Showing others that one cares through developing followers, recognising them and seeking to know and understand them.

Goleman, Mckee and Boyatzis (2006) associate transparency (being honest, trustworthy and having integrity) with self-management, which is an aspect associated with emotional intelligence.

Since in order to speak one must first listen, learn to speak by listening

- Rivri.

2.3.2.2.3 Kindness

Schutte (1998) refers to kindness as the degree of assistance and support offered to employees in a genuine, true and objective manner. Respectfully listening to what people say, observing as many views as possible before judgement is passed, is kindness. Kindness also refers to observing appropriate language and controlling emotions, appreciating efforts and rewarding success. Offering assistance to develop actions for mistakes whilst creating a sense of team ownership are aspects of kindness exercised by leaders. Pickard (2005) refers to kindness as being helpful by nature. Kindness is the forerunner of being respectful. Reaching out to another provides the opportunity to engage meaningfully.
This is my simple religion. There is no need for temples; no need for complicated philosophy. Our own brain, our own heart is our temple; the philosophy is kindness

- Dalai Lama

2.3.2.2.4 Encouragement

Schutte (1998) describes encouragement as the degree of physical and emotional support honestly given to employees despite past failures. Effort is acknowledged and a sense of excitement and positiveness about the future is created. Ponder (2006) associates encouragement of employee participation and decision making with participative or direction-orientated leadership. Through obtaining and encouraging employee inputs, the leader accesses a pool of data, experience and opinions.

Kelloway, Sivanathan, Francis, and Barling (2004) state that the lack of support creates job stress for an individual with a resultant breakdown in relations between leaders and subordinates. Schutte (1998) associates supportive leader attributes with transformational leadership. Kelloway et al (2004) distinguish between four types of support that constitutes social support:

- Institutional support (task specific help)
- Emotional support (empathy, affect and comfort)
- Informational support (awareness, advice and directives)
- Appraisal support (feedback, suggestions and encouragement)

In organisational safety context for example, the failure to provide the appropriate safety directives to perform a specific task in a safe manner (in other words informational support), is described by Kelloway et al (2004) as a leadership failure.

This has a profound impact on employee stress. In a stressful work environment (like an underground mine) supervisors are in a favourable position to have the largest positive impact on stress through their support. However if the supervisors are also the source of stress, support may not be perceived as beneficial with negative
effects on employee well-being (Kelloway et al, 2004). Power and influence go hand in hand. Rice (2005) argues that the way power is used determines how leaders influence others. When power is properly used, people are encouraged.

Adiparvar (2005) states the purpose of encouragement is to expand activities. Encouragement depends on the ability to see a positive and expressing it in such a manner that is seems important. The purpose of encouragement is to expand activities opposite to criticism where the aim is to stop an activity. Encouragement is a process that involves the past, present and future. One can only start walking when one is able to balance and this depends on being able to stand.

Adiparvar (2005) proposes two steps to create a culture of encouragement. The first is situated in the past. Remembering how well a job was done or characteristics developed which made one great. Step two involves analysing negative feelings one might have to prevent one from taking the next step or to change. The key is confidence or self-efficacy that is built over time to actually perform. Sports coaches use these two steps to coach players. The exercising of a present skill is used to build on a new skill. Building on a positive past assist in making one remember the positives which propelles future action.

2.3.2.2.5 Unity

Schutte (1998) refers to unity as the degree that all employers accept each other irrespective of personality, race or gender to work together and support each other. He proposes five processes for creating unity:

- Creation of a culture of openness, understanding, teamwork and respect
- Involvement of employees meaningfully in job and safety related matters through utilising the collective cognitive ability of the team
- Treating people with respect and dignity
- Maintaining and promoting fairness
- Train people in behavioural skills.

Corrs Chambers Westgarth (2006) describes unity as teamwork with a common purpose. The key elements are faith in those who work with one and assisting fellow team members to do their jobs better. The skills required are communication and co-
operation. The International Organisation Standardisation (ISO) (2000), states that leaders establish the unity of purpose and direction of the organisation. It is up to leadership to create and maintain the internal environment in which people can become fully involved in achieving the organisation's objectives. Likewise, Swift (2004), advocates that the accomplishment of the organisational mission and culture is achieved through leaders. In a pluralistic society (for example South Africa) unity must be created through our diversity. The employment equity legislation in South Africa will ensure a diverse workplace.

Swift (2004) argues that a leader must create unity through this diversity by defining and enforcing the mission and culture of the organisation in terms of the areas of agreement and disagreement in such a way that areas where agreement is impossible are excluded from the scope of activities. In defining areas of agreement and disagreement, the mission defines the purpose. Agreement is obtained through the prevailing organisational culture that determines the various decision types, such as those of specific teams.

Keller (2005) advocates defining a team's identity, mission and purpose. The Iowa Association of School Boards (2005) identified ten aspects of team development that constitute effectiveness:

- Commitment describes team members' understanding and commitment to group or team goals.
- Acceptance of each other as team members by being friendly, concerned and interested in each other.
- Clarification is obtained through acknowledging and confronting conflict openly.
- Belonging is created through team members listening with understanding to one another.
- Involvement is created through including team members in decision making.
- Support is shown through team members recognising and respecting individual differences.
- Achievement is fostered through team members contributing ideas and solutions to problems.
- Pride is obtained through team members valuing contributions of other members
• Recognition is provided through team members recognising and rewarding team performance.
• Satisfaction is created through team members encouraging and appreciating comments about team efforts.

2.3.2.2.6 Clear guidelines

Schutte (1998) refers to clear guidelines as the clarity of each person's role in terms of various areas of responsibility. The associated behaviours proposed are:

• Clarify each person's role before embarking on a new venture.
• Ensure each person understands what is expected in terms of effort.
• Draw clear lines of responsibility.
• Specify performance limits.
• Involve employees meaningfully in order to clearly understood roles and responsibilities through team synergy and pressure.

'All the world is a stage, and all the men and women merely players'
- W. Shakespeare

Role is described as a set of expected behaviour patterns assigned to a person occupying a specific position in a social entity (Keyser, 2003).

Keyser (2003) identifies four aspects related to roles namely role identity, role perception, role expectations and role conflict.

• Role identity consists of attitudes and behaviours consistent with the role.
• Role perception refers to one's view of how one is supposed to act in a given situation.
• Role expectation is defined as how others believe one should act in a given situation.
• Role conflict develops when the individual is confronted by divergent role expectations. Compliance with one role makes the compliance with another difficult.
Role conflict may lead to inner tension and frustration by the incumbent experiencing the conflict and Keyser (2003) states that behaviours to address the conflict vary from rule compliance, withdrawal, negotiation or congruency. The latter is described in terms of the cognitive dissonance theory discussed in the previous chapter. Defining roles and providing role clarity have specific implications for diminishing stress.

Ivancevich et al (1996), state that within one role three differences may occur. The first is the expected role (what is expected from the role). The second is the perceived role described as the behaviours that an incumbent believes he or she must enact. The third is the enacted role, which are the behaviours an incumbent actually performs. As a result of these three differences role conflict may arise leading to stress being experienced. Clear guidelines thus assist to not only relieve stress being experienced through role conflict, but also mediate the behaviour(s) required within a specific role.

2.3.2.2.7 Frontline visibility
Schutte (1998) describes frontline visibility as the degree to which management is visible at all levels including the rock face. Wellins (2005) states that there is a strong relationship between engagement of people at work and the degree to which employees perceive their roles and work related to the overall strategic direction of the organisation. By connecting job and strategy, leaders engage employees and the result is commitment, which promotes accountability. Schutte (1998) proposes the interface to be at the workplace where care and respect are exercised. Through visiting workplaces, leaders obtain firsthand knowledge and information that assist in assessing care and respect.

In the South African mining environment the Mine Health and Safety Act (as reported before) prescribes certain legal requirements that shiftbosses must perform when visiting underground workings from a safety perspective. Mine specific standards for miners regarding re-entry procedures before a shift commences, forces first line supervision frontline visibility with the resultant corrective actions that are (must be) undertaken to ensure a safe workplace.
Burns (1998) advocates 'up front' management being visible on the frontline. The advantage of being up front is that ethical behaviour can be restored if required which instils pride, trust and confidence. When visiting a workplace underground the shift boss and miner have a unique opportunity to engage employees in problem solving exercises for example installation of support or shaping the face of the stope. The appropriate action can now be taken and support provided to individuals and teams. The opportunity for coaching also arises for example to coach for proper installation of stick support.

Flin et al (2004) report that studies done by Bass and Avolio (1994) revealed that transformational leadership is positively related to subordinate performance, satisfaction and commitment. Flin et al (2004) associates traits such as charisma, inspiring and stimulating consideration with transformational leaders who provide followers with sense of purpose (connect job and strategy), instilling self-confidence and self-belief, articulating shared goals, create mutual understanding and create an attractive future. Taylor (2006) argues that being visible is not enough but also being available for subordinates in their time and space as well as on their terms.

Kinni and Kinni (2005), forward inspirational leaders motivate followers to act. Visibility matters in this regard since the presence of a leader enhances the morale and accountability of followers. Schutte (1998) proposes four ways to promote leader visibility:

- Interview people at their workplaces where care and respect is portrayed.
- Visiting employees at their workfaces to gather and assess information especially on the rock face where unsafe conditions prevail.
- Empower and encourage teams to creatively promote safety on the rock face.
- Develop employee capability and encourage teams to work safely.

A visible leader is therefore tasked with having to develop communication skills (listening, non-verbal and verbal) problem solving and decision - making as well as coaching skills.
2.3.2.3 Respect

Respect can best be explained in terms of the well-known phrase ‘do unto others, as you would expect them to do unto you’. Schutte (1998) describes respect as reflecting the perceptions of team members’ honest, caring and appreciative acceptance of the value of individual contributions and suggestions while Van Daalen and Odendaal (2003) identify respect as a fundamental value underlying any organisational development effort. As mentioned earlier, Scottgeller (2006) describes respect as the glue that holds people and organisations together. Respect is exercised in two forms.

Briski (2004) distinguishes between forced and voluntary respect. Forced respect manifests in rudimentary and regulatory respect. Rudimentary respect is granted when one feels obligated and regulatory respect is shown through regulations (in the military junior officers vs. senior officers). In the mining industry the shiftboss is a legal appointee with safety responsibilities (as discussed before) commanding forced regulatory respect.

With regards to voluntary respect, Briski (2004) argues that it is earned which make people want to follow the example set.

Briski (2004) offers four ways of earning voluntary respect:

- Treat followers with respect with both discipline and kindness.
- Care for followers is shown through providing assistance.
- Personally exceed standards which followers are held to.
- Be fair in how followers are treated.

When respect is voluntarily earned, followers find motivation to perform with excellence and not do just the bare minimum to stay out of trouble. When respect is exercised on the individual level, it creates the foundation for team effectiveness since followers emulate one voluntarily.
Coyote (2006) proposes the cycle of respect as the foundation for creating trust.

- **Respect for others** (Leaders must show unfailing respect for those they deal with)
- **Acknowledge their potential** (By showing respect even to the lowest person in the organisational hierarchy the leader allows for potential to develop.)
- **Using their abilities well** (By allowing for potential to develop people contribute and use their abilities.)
- **Creating meaning and purpose** (When people use their abilities it creates meaning and purpose)
- **Letting people give of their best** (People give their best when they have meaning and purpose)
- **Fully recognise people contributions** (Respect leads to recognising contributions)

**Figure 2-28  The cycle of respect (Adapted from Coyote, 2006)**

Schutte (1998) associates the concepts of dignity, openness, approachability, confidentiality, courtesy, helpfulness and friendliness with respect.

**2.3.2.3.1 Dignity**

Schutte (1998) refers to dignity as the degree to which people are treated in a respectful way as well as being treated as human beings. Hess and Cameron (2006) postulate that dignity is a pre-requisite for values-based leadership. Extraordinary outcomes can be created when leaders act both ethically and virtuously whilst treating people with respect and dignity.

Schutte (1998) offers five behaviours that, when applied, ensure that people are treated with dignity 1) never degrade people 2) building on people’s strength build team spirit 3) display sensibility for people's feelings and emotions (empathy) 4) responding respectfully to people's opinions and 5) attentive listening to what people say.
Shanks (1997) asserts that treating people with dignity is equivalent to ethical conduct. The right to be treated as free and equal is a basic moral right.

All animals are equal. Some are just more equal than others

Animal Farm – George Orwell

Berg (2000) argues that when diversity is valued, treating one another with dignity and respect is fundamental.

When you ride a horse, sit close and tight, if you ride a man, sit easy and light

- Benjamin Franklin

2.3.2.3.2 Openness

Schutte (1998) refers to openness as the honest exposure of oneself, one’s ideas and perceptions to colleagues. Honesty to oneself and others fosters team openness. In a pluralistic, democratic society, transparency is required with regards to decision-making. This inherently requires a philosophy of openness. When participation and involvement of employees are sought, a climate of openness to ideas and suggestions and sharing of information is a prerequisite.

In organisational context the free-flowing of information in all directions within the organisation require openness. In the context of organisational safety, Scott Geller and Wiegand (2005) argue that, considering personality traits and their impacts on safe performance, the reasonable prediction can be made that employees who score relatively high on openness to experience will accept and participate in new injury prevention programmes.

Koellner (2002) argues that good business is equal to great leadership that creates involvement by all. With more and more employees being directly on-line with communication (e-mail) the pressure on leadership will increase to utilise this to greater effect in communication. Leaders will thus have to create a climate of greater openness where information and decisions are disseminated at an increased rate in
order to remain competitive. Leaders will have to assist teams with decision-making processes. Koellner (2002) argues that people that do work must be trusted and empowered. This means also more decision-making.

Chen (2006) argues that the key to participation is openness while Schutte (1998) advocates a climate of admittance of mistakes, disclosure of weaknesses, pro-active leadership to eliminate crisis situations and team support. This takes place in an atmosphere of openness. In an organisational safety context the sharing of safety information, pro-actively eliciting safety suggestions is dependent upon and fosters openness.

2.3.2.3.3 Approachability

Schutte (1998) describes approachability as the physical presence of, and perceived emotional space or caring - inviting atmosphere that is created by management. Ravi - Kumar (2006) associates approachability with transformational leadership and proposes a selective showing of weaknesses to mark approachability. Ginsberg (2005) postulates that approachability is not a one-way street but in fact a two-way street and consists of proactive approachability or out-bound approachability and reactive or in-bound approachability. Out-bound approachability is stepping into another person's domain through taking a bold initiative whereas in-bound or reactive approachability is allowing someone inside your domain and requires openness and being available and accessible to others. Ginsberg (2005) proposes seven ways of maximising one's approachability.

- Building social capital refers to the willingness to develop new relationships and is both an inward and outward-bound process.
- Outbound – what you don't say involves the non-verbal behaviours of conversation (body language).
- Drop me a line refers to being easily accessible through telephonic and electronic availability.
- Physical availability is associated with openness of personal space.
• Inbound – personal availability is associated with the inbound process that requires openness of mind and heart.

• Keeping it real requires an authentic personality.

• What you say involves the dynamic processes of conversation (listening, courtesy in no interruptions and keeping and showing attention).

Ginsberg (2005) offers five benefits of approachability:

1) Opportunity refers to taking the opportunities that arise to maximise approachability whether it be strangers or people one knows.

2) Confidence is fostered within people to come forward with issues if one is approachable.

3) Permission is provided through promoting communication and through engagement interaction when inquiries are made, people relate, play help or manage (five reasons for human interaction).

4) Comfort is essential for approachability, both people approaching and or being approached.

5) Trust is reflected in opportunity, confidence, permission and comfort. When one trusts or is trusted, approachability is enhanced.

2.3.2.3.4 Confidentiality

Schutte (1998) describes confidentiality as the respect shown to individuals by keeping personal and company information confidential at all times. Confidentiality is fostered when sharing of information is on a need to know basis, when people are treated fairly and respectfully, when people are not discussed in their absence and when confidential information is not shared with anyone.

The University of Iowa (2005) associates confidentiality with communication skills. Confidentiality originates from being discreet and exercising discretion when dealing
with employees whether it be in conflict situations, misconduct, issues relating to performance or employees experiencing personal problems or health issues.

Bjarnason and Vaiani (2004) define confidentiality as ensuring information is maintained from unauthorised disclosure as well as keeping information within proper bounds. The key is a legitimate need to know. Confidentiality also forms the basis for trusting relationships. Gewirth (2001), states that confidentiality is a moral obligation since it builds autonomy and trust among people while Lansing (2002), states that honouring confidential information is critical to maintaining harmonious relationships.

Confused of Calcutta (2006) argues that confidentiality is associated with relationships. Once confidentiality is broken, the relationship is also in jeopardy since confidentiality is about trust. Two aspects of confidentiality is distinguished namely confidentiality of privacy of information and of identity. Both are associated with trust and if one or both is violated trust is broken which affects the relationship. Leaders often find themselves in mentoring relationships and need to adhere to confidentiality to foster the relationship with the mentee. Sweeney (2003) argues that effective mentoring requires confidentiality and that even the sharing of information of the mentor about the mentee without permission of disclosure could lead to a breach of trust, which puts the mentoring relationship at risk.

**2.3.2.3.5 Courtesy**

Schutte (1998) refers to courtesy as displaying good manners. In practise this means being positive and criticising less. In growing individuals as well as teams, courtesy must be exercised. The associated skills with courtesy is not just portraying good manners, but listening to people. This also fosters approachability as discussed earlier. The Springfield Chamber of Commerce (2005) defines courtesy as being polite and considerate as well as to act with manners and to be generous and helpful with others.

Kagan (2000) postulates three main character virtues namely relationship virtues, responsibility virtues and personal virtues. Courtesy is associated with relationship virtues and through personal interaction a structured approach to character
development is fostered provided the individual internalises the interaction experience. Duncan (2005) argues that treating people with courtesy invariably generates a better reaction from them. The daily interaction with other people influences quality of life. By treating people with courtesy, quality of one's own life is improved.

Since custom and practice is shaped by societal norms that govern behaviour, this framework of unwritten rules guides interactions and act as a compass to guide social interactions. Martin (2006) associates treating people with consideration and dignity with etiquette, which is showing respect towards others. This is also applicable to relationships of diversity. Landrover (2007) states diversity is about respecting, valuing and having a greater awareness of others. An inclusive culture (which values diversity) encourages everyone to culminate to his or her full potential. When people are treated with courtesy and consideration they can contribute to the business.

2.3.2.3.6 Helpfulness

Schutte (1998) describes helpfulness as reflecting an honest attitude of assistance and support. In caring and growing employees, Schuitema (2004) states providing employees with means, ability and accountability as the essential elements of caring and growing people. Providing means not only refers to providing the necessary tools or equipment to perform a job, but also the role of coaching in performing a task becomes important, especially where the subordinate lacks a specific skill. By coaching the subordinate to perform better, the leader assists or helps the subordinate to grow.

2.3.2.3.7 Friendliness

Schutte (1998) describes friendliness as the kindly manner in which people should be treated. Friendliness is also associated with good manners by being polite as well as showing respect for others. Krause (2003) describes friendliness as communicating and acting in ways that are polite, respectful, considerate and caring towards others.
Krause (2003) identifies another side to friendliness as described above which is sharing interest in and getting to know one's people. Managerial effectiveness is greatly improved if one talks to one's people about interests, hobbies and family issues besides doing the basics of knowing first names. Establishing relationships of both business and personal enhances performance. The benefit of friendliness according to Filson (2006) is remaining in control (avoiding emotional outbursts). People respond more readily to friendliness and modelling behaviour that rubs off, thus increases the chances of obtaining support.

Filson (2006) argues that friendliness can be a weakness if it avoids challenging people to do the difficult things to obtain good results. But friendliness can be a tool to leaders to drive hardcore issues. Being unfriendly makes it so much harder to motivate and to reach out to people. Farrington (2005) argues that leadership and motivational abilities are closely related. Friendliness is the key ingredient.

2.3.2.4 Ownership

Ownership completes the aspects pertaining to relationship credibility. According to Schutte (1998) ownership reflects the perceived authority of decision-making, control, latitude and independence an individual or team has at their level in the organisational hierarchy. Ownership is enhanced through management's willingness to make employees responsible for their decisions and actions as well as backing (defending) subordinates when actions and decisions have been agreed upon.

Pfeffer et al (1999) argue that organisations are about interdependence and warns that internal competition kills co-operation and works contrary to interdependence. Innovation, productivity and performance are the results of collective action and not just individual efforts and behaviour. This is achieved when employees have bought into the organisation. Schutte (1998) associates information quality, truth, job security, creative scope, listening willingness, backing and future prospects with ownership.

2.3.2.4.1 Information quality
Schutte (1998) describes information quality as the ease with which information can be understood and applied.

Schutte (1998) proposes the following ways and means to ensure information quality:

- Communication must be honest, open and done in a caring manner.
  - Understanding must be ensured
- Filtering information to only cascade the correct information down the hierarchy
- Utilisation of natural team structures to involve employees in forums
- Through proper two-way communication and honest, open two-way communication a working culture is established.

Goman (2002) professes that leaders build trust and mutual respect when creative contribution is nurtured. Through sharing of knowledge, not just vertically but also horizontally in the organisational hierarchy, a culture of success through collaboration is created. In the organisational safety context this translates to learning from mistakes.

Goman (2002) also proposes five main reasons for people not sharing information:

- People believe that knowledge is power
- People are insecure about the value of their knowledge
- People don't trust each other
- Employees are afraid of negative consequences
- People work for people who don't share knowledge.

The way information is dealt with determines whether it becomes an obstacle or enabler of sharing knowledge (Goman 2002). Informed collaboration is seen as essential for organisational success. The buzzwords are synergy and knowledge. Information sharing is a key ingredient in creating synergy.

Wai-Yi Cheuk (2002), postulates that the change in the global business environment requires a need to work differently and argues that establishing information literacy requires a shift in organisational culture, which appreciates innovative problem solving and diverse ways of working and thinking. Since one of the demands of the
workers of the future is to access, manage and use the vast amount of information delivered to them through various media, they are challenged to work in an unstructured manner. This demands being able to work individually as well as in teams where sharing of knowledge is essential to success. Opportunity for learning mindsets require empowerment and decisions based on sound judgments.

2.3.2.4.2 Truth

Schutte (1998) refers to truth as the degree to which employees are aware of and accept the reasons behind management decisions and is reflected when important documents are handed to juniors to present to other people and when worker representatives are allowed into management meetings to report on worker perceptions, truth is built into the organisational system because it is fostered by trust.

Price (2002) argues that trust can only be established by telling the truth. Once trust is established, understanding, loyalty and accountability can flourish. Trust also enhances commitment and encourages risk taking but it starts with the truth. Being truthful to subordinates also means telling them if one doesn't have the answers. Especially in turbulent times people appreciate the truth. Price (2002), states that truth assists in moving forward with faith and creates hope.

Welch (1995) argues that when leaders fail to listen to subordinates the latter do not share the truth resulting in hiding of vital information, which results in fear of accountability and a decline in ownership. In addition, being truthful is not a top-down approach but a bottom-up process as well. There is however a condition. Leaders need to be open and create a culture of openness. Openness is also acquiring accurate information and the perspective of others and not only being open with employees.

Covey (1990) describes openness as not just acquiring accurate information and perspectives of others, but also giving full consideration to their intentions, desires, values and goals and not only focusing exclusively on their behaviours.
Maddox (2005) associates great leadership with telling the truth with understanding and seeking to learn as much as possible about issues requiring action. When leaders are truthful, subordinates will share information willingly. Being truthful then not only holds potential for leaders to create ownership within subordinates, but an inherent fear of accountability (accepting ownership) breeds fear of being truthful. Truth is therefore a two way process.

Lawrence (2006) postulates a new humility in leaders and calls it neohumility which is associated with self-awareness, valuing others’ opinions, willingness to learn and change, power sharing, ability to hear the truth and admit mistakes as well as working to create a culture of openness where dissent is encouraged within an environment of mutual trust and respect. However leadership is exercised and practised through two dimensions; consideration and initiating structure (Lawrence, 2006). Consideration relates to the way the leader develops an environment that promotes warmth, friendliness, trust, and support. Initiating structure requires from the leader to assign tasks, specify procedures and be action oriented. The path to trust is located in being truthful and fostering an environment of truth.

2.3.2.4.3 Job Security

Schutte (1998) describes job security as the extent to which people feel their skills are developed in order to remain competitive in their field of work. A person's experience of job security is also based on a perception of own capability. Job security is fostered when people are kept informed through regular interactive sessions, and career paths training is maintained through structured development processes, e.g. courses and studies to ensure employees are abreast with developments in their field of expertise. Schutte (1998) also relates the development of career paths and individual development plans as part of a performance management process to enable employees to become and remain competitive.

Maslow (as reported by Gawel, 1997) developed a theory of how people satisfied various personal needs in work context. Security needs were second order needs, whilst physiological needs like hunger were first satisfied (first order needs) before progression to the second level occurred. Third order needs (love and belonging-
ness) followed second order needs to level four order needs (esteem) and eventually level five order needs (self-actualisation).

Lowe (2001) reports that a study conducted in Canada in the year 2000 found that job security rated 60% (sixty percent) of what workers considered important in a job. Job security is also closely tied to workplace safety. Similarly, Probst and Brubaker (reported by Carpenter 2001) revealed a strong association between employees' feelings of job security and their satisfaction with supervisors, pay and the work itself. This satisfaction correlated high with working safely and acquiring safety knowledge. Employees who experienced job insecurity on the other hand were more likely to ignore safety procedures.

Job security is negatively impacted upon in three instances:

- Organisational change
- Stress in the job or workplace and thirdly
- The nature of the contract of service.

Considering organisational change Roodt and Odendaal (2003) state that change in the organisation is brought about by changes in the strategic intent (due to forces driving change which will not be discussed) of the organisation and this has a rippling effect in the company. The way an organisation operates is affected by changes in design, structure and culture.

Work design impacts on individuals and may lead to fear for job losses. Employees either respond favourably or not, to changes at work resulting in either more or less commitment. Schutte (1998), states that less commitment may lead to disconnection in the organisation, which affects the safe mindset of an individual. Commitment in turn, is affected by stress in the job or workplace, which is described by Lozanski (2003) as the result of emotional, physical, social, economic or other factors that require a response to change.

Two types of stress are distinguished namely positive and negative stress. Stress that occurs in excessive amounts is associated with negative stress, which may impact on the physical or mental well being of an individual. Stressors that affect the
job security of an individual are typically job redundancy, staff cutbacks or layoffs and are classified negative stressors.

Lozanski (2003) identifies five categories of job stressors namely 1) factors unique to the job (noise levels) 2) role in the organisation (role conflict or ambiguity) 3) career development (job insecurity and satisfaction) 4) interpersonal (relationships at work (conflict) 5) organisational structure and climate (participation and communication). Stress manifests itself on three levels within an individual namely 1) Physical (headaches) 2) Psychosocial (anxiety) 3) Behavioural (eating disorders) according to Lozanski (2003).

Stress is not just as a result of the factors described above but may also be instituted by supervisors or managers using bullying tactics. Bullying is associated with psychological violence according to Bulby Online (2006). Bullying tactics are typically constant dissatisfaction with performance, using the work of subordinates for self-claim, nitpicking, ignorance of contributions and compulsive control.

The nature of the contract of service may in the final instance impact on job security.

In a study conducted in India, Asim, Kulkarni, Chaudhuri and Saiyed (2005) concluded that higher accident frequency and severity rates were found in temporary workers compared to permanent workers. This related to job insecurity factors.

A study conducted in the United States of America in 2005 by the University of California confirmed that immigrant workers, among others were less likely to report hazards on the job due to fear of job security. This study was inconclusive in the referral to immigrants as permanent or contract workers. However a recommendation was to assist immigrants with training in health and safety issues at work. The conclusion can be made that the immigrant’s referred to were non permanent workers since permanent staff receive health and safety related training due to legislative requirements.

2.3.2.4.4. Creative Scope
Schutte (1998) describes creative scope as the opportunities people are given to experiment as well as to present creative ideas to management. According to Schauf (2007), creativity is enhanced where employees are self-managed. Self-management needs a shift in supervisor attitudes from directing to coaching. Self-management is also an empowerment process. This is achieved through setting clear goals, objectives and expectations of employees. This allows for employees to monitor own progress, be accountable and develop ownership for decisions and actions. Creativity and innovation are therefore inseparable.

Paust (2006) offers four best practices for creating and embracing an innovative work culture:
1) promote individual growth through development and increased knowledge of the organisation to contribute more
2) create a sense of belonging through appreciation, reward, ownership and accountability
3) build confidence through experience, encouragement and freedom
4) optimise the work environment through flexibility, comfortable and well equipped work places.

Schutte (1998) proposes behaviours to foster creativity through management practices namely showing interest in experiences and encourage sharing, especially in teams. Opportunities where innovativeness could be enhanced need to be created as well. This requires a fundamental shift in management approach. Schuitema (2003), as discussed previously, advocates the care and growth process as a means to empowerment and to obtain legitimate power.

**2.3.2.4.5 Listening willingness**

Communication is generally accepted to occur vertically and horizontally within the organisation. It is a two-way process (sending and receiving) and listening is also a two-tier process. It is not only the task of the leader to be understood, but the leader must also understand. Ivancevich et al (1996) state that this involves listening with understanding which is a conscious decision to listen either actively or passively between active and passive listening. Active listening is where the listener attempts to get the facts and feelings in what is heard and through listening assists the speaker to work through and out of the problem or issue. Passive listening means passively absorbing what is communicated.
Active listening has three distinct advantages according to Ivancevich et al (1996). The first is that it brings changes about in people, not only about attitudes towards themselves and others, but also changes in their values and philosophies. The second is actively listing rubs off, when people are listened to sensitively, they tend to also listen to themselves and other with care and clarify own thinking and feelings in the process.

Thirdly, active listening brings about changes in the listener. Listening grows the listener. Not only does the listener obtain more information, listening builds deep, positive relationships and assists to alter the attitudes of the listener constructively.

Any supervisor leading people in the context of work need feedback for instance on how a project is progressing. Listening to responses is a way of displaying support.

2.3.2.4.6 Backing

Schutte (1998) associates backing with providing support to subordinates and states that encouragement and reward in a fair and consistent manner constitute support. This support is conditional and must be open and honest.

Schuitema (2004), cautions that care and growth of individuals can only be achieved if they are provided with the means, ability and accountability. Having the means such as equipment, enable employees to do the work. Ability is enhanced through learning and training while holding people accountable for what they do, encourages responsibility and ownership. A key component in people development is providing support, not just financially but also through feedback on performance. The performance contract is reciprocal and is based on what support or assistance is needed to enable the individual to achieve a target. When superior and subordinate jointly decide on a course of action, the only way to ensure achievement is by the superior providing backing or support.

Hock (1999) advises that in every failure one must look inward to oneself. Since the concept of failure is constant and certain, one has failed as a leader if subordinates do not understand and accept the concept. This constitutes tolerance for mistakes.

Always tell the truth, and only the truth and do so promptly.
Robins et al. (2003) state the healthy organisation is characterised by trust, authenticity, openness and a supportive culture, which McKinnon (2006), associates with the development, coaching and facilitating of personal growth in subordinates. This constitutes servant leadership. Servant or supportive leadership is rooted in the Path - Goal theory (based on the expecting theory of motivation) developed by House.

Ivancevich et al. (1996) describe path-goal theory as the leader's influence on the subordinates' perceptions of work-goals, self-development goals and paths to goal attainment. Path clarification refers to the leader clarifying behaviours required for goal attainment, whilst removing obstacles for performance and rewarding achievement of performance goals. This affects performance, satisfaction and motivation of individuals and groups.

Leaders have to adopt different styles depending on the situation and Allen (1998) states it is the task of the leader to assist followers in attaining goals as well as to provide direction and support whilst aligning personal and organisational goals in subordinates. Four styles of leadership is identified by path-goal theory namely achievement-orientated, directive, participative and supportive styles. Being supportive indicates concern for individual's psychological well - being and works best when followers lack confidence. Adopting a different style to a different situation however requires that leaders are flexible.

2.3.2.4.7 Future prospects

Schutte (1998) describes future prospects as the open and honest involvement of employees in business prospects and the caring support of employees to take responsibility for their own destiny. Subordinates must be made aware that their future prospects depend on their contribution towards safe production.

In a study conducted in the Asia-Pacific region, Lieb and Bentz (2005) identify five aspects that influence employee perceptions of the future prospects of an organisation: 1) establishing a robust management development programme 2)
recognition of talent and developing appropriate rewards for retention 3) creation of personal growth opportunities 4) creating an environment where ideas can be shared (participation) and 5) allowing managers to manage with the associated responsibilities (empowerment).

Schutte (1998) proposes four processes within the organisation to ensure employees experience a positive future prospect of and within the organisation namely 1) involve employees meaningfully and continuously in the achievement of business goals and decision making (participating) 2) train employees in the required technical and behavioural skills (development) 3) honest, open and caring communication with respectful listening and 4) encourage creativity and innovation as well as reward success.

The National Institute for Occupational Safety and Health in Cincinnati in the United States of America (2006) states that the main obstacle in developing a belief in the future prospects of an organisation is work related stress which develops (within an individual) as a result of an incompatible job. The National Institute for Safety and Health (2006) propose various ways to prevent job stress. Firstly alignment of the workload to the capabilities of the individual and resources assigned. Secondly designing jobs to stimulate and provide opportunities. Thirdly clearly define worker roles and responsibilities. Fourthly provide opportunities for participation in decisions and actions affecting their jobs and lastly provide opportunities for social interaction.

Ownership is vested within the individual and groups by sharing quality information in a truthful manner, promoting job security, providing for opportunities for employees to be creative, listening effectively to employees, backing and supporting subordinates as well as promoting the future prospects of the individual.

2.3.3 Work life experience (climate)

2.3.3.1 Introduction

The second aspect of the Safe Human Mindset Model developed by Schutte (1998) addresses the aspect of work life experience and work environment, which reflect
the prevailing climate within the organisation. According to Schutte (1998) workers experience numerous experiences (sensations) in the organisation, which resembles the prevailing climate. Arvidson, Johansson, Ek and Akselsson (2006) describe organisational climate as a grouping of attitudes, feelings and behaviours. Climate remains stable over a period of time with regards to attitude and, as will be discussed, attitudes influence behaviour.

Oliver, Thomas and Cheyne (2006) state that organisational climate refers to the shared perceptions of members of an organisation about its essential properties namely policies, procedures and practices. According to Oliver et al (2006) climate has two attributes, these are 1) multidimensionality which refers to multiple factors on which employees can be questioned and 2) potential predictive power which aims to explain the impact of the organisation as a social system on the behaviour of its members for example safety, productivity, absenteeism, innovation and job satisfaction.

Oliver et al (2006) reason that in order for a climate to exist, two conditions must occur simultaneously; 1) intra-organisational homogeneity which refers to consensus among the perception of employees in the same company, plant, departments and groups and 2) inter-organisational heterogeneity which refers to differences between workers in their appraisal of climate if they belong to different companies, plants or groups. The existence of climate also displays two properties according to Oliver et al (2006) namely strength and level. Strength refers to the degree of overlap of employee perceptions in the same working unit and level is expressed through the mean value generated by all the workers of the same organisation.

In the context of organisational safety Dahl (2006) states that a safety climate is a strong predictor of the number of injuries (accidents) in the organisation. Employees' shared perceptions of how safety policies, procedures and safety practices are implemented by the organisation form the safety climate. Employees require sharing of information by superiors and co-workers about what is normal and expected within the work environment. This introduces the concepts of interdependence, which will be addressed in the section where culture is discussed.
Safety climate differs from safety culture in the sense that whilst culture (values and beliefs) is more enduring and long lasting, climate is temporarily and may change over a period of time (Wiegman, Zhang, von Thade, Sharma and Mitchell, 2002). Culture also directs in that it shapes and guides behaviour whereas climate is evaluative when for example attitudes are measured or respondents react to their perceptions on a specific attitude.

Newnam, Griffin, Mason, Guthrie and Tay (2006) report that studies conducted, identified safety climate as an important indicator of health and safety issues in the workplace. Studies conducted by Zohar and Luria (as reported by Newnam et al 2006) also established that safety climate influenced task performance and injury rates. Safety climate according to Schutte (1998) consist of a workforce satisfaction component (attitude towards the job and organisation) and a work environment and supportive relationship component consisting of the physical work environment and safety intent.

Barling et al (2004) describe safety climate as a key intersection between organisational and psychological processes and their relationship with safety. Safety climate is an antecedent to safety related motivation for employees and this motivation influences both behaviour of individuals and safety outcomes of the organisation (Barling et al, 2004).

The influence of climate and culture in organisational performance (including safety outcomes) are well - researched topics. Schutte (1998) states that research globally has established a relationship between organisational climate and culture and organisation performance and that up to twenty eight percent of revenue and profit can be explained by differences in organisational climate and culture. As up to seventy percent of variance in organisational climate can be explained by differences in leadership style (Schutte 1998), the role of leadership in organisational performance (creating conducive conditions for performance) cannot be over stated. The physical environment and safety intent collectively form the working environment and perceived supportive relationships.
Schutte (1998), states that organisational climate manifests as two integrated dimensions namely workforce satisfaction and work environment as well as perceived supportive relationships.

### 2.3.3.2 Workforce Satisfaction

Schutte (1998) distinguishes attitude towards the job and attitude towards the organisation as two components of workforce satisfaction. The collective impact of both attitude towards the job and attitude towards the organisation has a strong and direct bearing on employee behaviour. These two attitudes determine vital parts of the employee mindset conducive or not to safe behaviour. Rucci (as reported by Schutte 1998) verified that attitude towards the job and organisation has a greater effect on employee behaviour and loyalty than any other human dimensions or group of dimensions put together.

#### 2.3.3.2.1 Attitude towards the job (job satisfaction)

Before the dimension of attitude towards the job is discussed, it is imperative to examine the theory that underlies attitudes.

Miller (2003) describes attitudes as evaluative statements which are held concerning people, objects or events and reflect how one feels about an issue(s) and identifies three components of an attitude: cognition, affect and behaviour. The three components are explained in the following example:

**Cognition**  – racism is bad (value statement) and the cognitive component

**Affective**  – emotional or feeling part of the attitude: I do not like Luke because he is a racist.

**Behavioural**  – Intention to behave in a specific way towards someone or something: I avoid Luke as a result of my feelings towards him or confront him as a result of his racism.

Miller (2003) argues that attitudes are important in the organisational context because behaviour affects job satisfaction, job involvement and organisational commitment.
- Job satisfaction refers to the attitude an individual holds in general towards his or her job. High job satisfaction is related to a positive attitude towards the job.

In a study conducted by Barling, Kelloway and Iverson (2003) the researchers found that high quality jobs (training, variety and autonomy) affected occurrences of occupational injuries through the mediating effect of job satisfaction.

Schutte (1998) identifies six components of job satisfaction 1) work enjoyment refers to the perceived degree of job satisfaction 2) Accomplishment refers to the degree to which a goal or task is accomplished 3) Pride refers to the degree of pride or fulfilment an individual has with working with a group or team 4) Workload refers to the influence that the amount of work has on the overall attitude toward the job of an employee. Workload contributed to job satisfaction to the extent that employees were involved in the amount of work designated to achieve targets, the development of employees to perform and praise and acknowledgement to employees for value-added contributions. 5) Working conditions fell strongly in the management domain and 6) Management treatment refers to the influence that managers and supervisors have on the attitudes of employees by shaping their mindsets. Positive individual mindsets influence relationships positively and foster trust, caring support, respect and ownership.

Schutte (1998) argues that employee participation in job and safety related issues contributed to work enjoyment. Work enjoyment was also enhanced when employees were allowed to be creative, empowered, trained and developed to add value. These impacted on employees’ sense of accomplishment, which had a direct bearing on performance. Rewarding or recognising achievements contributed to job satisfaction and provided a means of measuring employee performance (Schutte 1998).

Management have to be visible in the workplace to experience working conditions, constantly communicating with employees the impact of working conditions on their attitudes and resultant behaviour, obtaining feedback and suggestions from employees with regard to working conditions and their (employees’) behaviour and involving employees when changes in working conditions are envisaged. Equipping
supervisors with relevant management skills, encouraging two-way communication, ensuring knowledge of what work subordinates perform and encouraging social interaction between supervisors and employees all contribute to working conditions (Schutte 1998).

A healthy work environment (task content, pay and working hours) is also a factor perceived by employees to influence job satisfaction (Lowe, Schellenberg and Shannon, 2003). A study conducted by Gyekye (2005) confirmed a positive relationship between job satisfaction, safety climate and workers were correspondingly more committed to safety policies and practices and registered lower incident rates. A similar study was conducted in Ghana to establish an African perspective and reports workers in high accident categories expressed less job satisfaction, exhibited negative perceptions regarding safety and were less committed to safety management policies compared to workers in low accident categories (Gyekye, 2006).

In examining leadership style, Ponder (2006) examines democracy versus autocracy, participation or direction, relationship or task orientation, consideration or initiation and action or inaction and concludes that leadership style affects employee job satisfaction which invariably impacts on employee attitude towards the job (job satisfaction) which determine attitudes and behaviour, also in organisational safety context.

Miller (2003) identifies six job dimensions that either contribute to or influence job satisfaction:

- The first is the work itself, which is the extent to which the job provides the individual with stimulating tasks, opportunities for learning and personal growth, the opportunity to exercise responsibility and promote accountability for work performed.
- Secondly, promotional opportunities not only through advancement in the hierarchy but also lateral development to personal growth.
- In the third instance supervision, includes the provision of emotional and technical support with the required guidance to complete tasks.
• Fourthly co-workers contribute to job-satisfaction to the extent to which they are emotionally technically and sociably supportive.

• Fifthly working conditions facilitates job satisfaction both psychologically and physically.

• In the sixth and last instance, pay received and the perception that it is equitable to similar work performed within or outside the organisation.

- Job involvement measures the degree to which an individual identifies psychologically with the job and considers his or her perceived performance in a positive light.

- Organisational commitment is described as a state an individual identifies with an organisation, its goals and the wish to retain membership of the organisation. The psycho-social contract discussed in Chapter 1 refers.

People seek to have consistency between their attitudes and between attitude and behaviour in order to appear rational (refer to the underlying theory of cognitive dissonance described earlier in this chapter).

2.3.3.2.2 Attitude towards the company (company satisfaction)

Schutte (1998) states it is evident from research globally that when employees relate or connect the meaning of their work with company goals, it becomes a positive driver of responsible behaviour. Schutte (1998) postulates that workforce attitude towards the company is shaped by four dimensions: understanding the future of the organisation, organisational competitiveness, understanding the business strategy and lastly connect own job with organisational strategy.

According to Schutte (1998) supervisors and managers shape perceptions of the future of the organisation. Employees’ belief of the future of the organisation is strengthened through regular feedback of the performance of the operation. When national and international trends including competitiveness is shared, and the vision created and shared, efforts to outperform competitors can be identified and maintained.

There is not a direct relationship between future of the organisation and occupational safety but an indirect relationship. According to the National Institute for

Stress on the job is defined as the harmful physical and emotional responses that occur when job requirements do not match the capabilities, resources and needs of a worker. Two characteristics of job stress are distinguished: individual characteristics (differences) and secondly working conditions. The Individual characteristics are for example personality and style that differ between individuals but certain job or working conditions are stressful to most people.

NIOSH (2006) identify six stressful job conditions that may lead to stress and increase the risk of injury and illness namely 1) Design of tasks including workload, long working hours, shift work, menial tasks and under utilising people 2) Management style including lack of worker participation in decisions that affect them, poor communication and unfriendly policies and practices 3) Interpersonal relationships in a poor social environment and a lack of support or assistance from peers and supervisors 4) Work roles including conflicting or uncertain job expectations and too much or too little responsibility 5) Career concerns through job insecurity, lack of growth opportunity or unprepared employees for rapid change and 6) Environmental conditions which are unpleasant or dangerous (noise, pollution or ergonomic factors).

Organisational competitiveness is by and large developmental by nature. Schutte (1998) argues that organisational competitiveness is enhanced through establishing and implementing best practices, leadership development and equipping supervisors with leadership and behavioural skills, involving employees to cascade responsible behaviour, through education and training develop the capacity and capabilities of employees and continually align and synergise employee and company goals.

Lopez-Valcarel (2002) argues that globalisation and the resultant competitiveness in global markets have had a significant impact on occupational health and safety in specifically two areas namely 1) harmonising labour standards through standardising health and safety conditions in the workplace and 2) harmonising product standards has become a prerequisite for economic integration.
Pietila (2006), postulates that managing risks is a clear factor of competition especially in global organisations, which require systematic and well-organised systems and practices. Risk management therefore, when well managed, provides a competitive edge for organisations.

Good Corporate Governance is also associated with quality risk management practices which are quantifiable in terms of affecting the bottom line. Drennan and Beck (2001) state that the basis for corporate governance and risk management emanate from the Cadbury Reports in the early 1990's and Turnbull Report of 1999. Through the ongoing systematic identification, evaluation and control of risks and potential threats to an organisation, the organisation is in fact managed more effectively (refer to business results in the world-class organisation).

Connecting job and strategy is inherently a participative process. Schutte (1998) postulates that this is achieved through creating and sharing a common vision with every employee, involving employees in matters that affect them, creating forums for interactive two-way communication in strategic and operational issues, establishing clear goals at all levels and teams inclusive of contributors (bottom up) and lastly being inclusive of ideas (respect), decisions and praising contributions. Camillus (1999) proposes two direct ways of connecting a person's job and organisational strategy.

The first is to link it to individual performance through assessment processes. The second is to not only communicate the job and tasks and how it links to strategy, but also to incentivise achievement. This implies performance management. Camillus (1999) proposes task teams (which consist of both managers and employees) to develop and monitor implementation of actions to achieve strategy. This ensures commitment and buy-in. Often organisational structure is affected by a specific strategy and task teams assist to ensure commitment and minimise the effect of change. It complements the concept of participation discussed in the World-Class Model.

Attitudes are therefore important in that perceptions also determine or influence a person's respective attitude about an issue or people and this attitude finds
expression in specific behaviour through a process of finding consistency between attitudes and consistency between attitudes and behaviour.

2.3.3.3 Work environment and perceived supportive relationships

The second aspect within climate in terms of the Safe Human Mindset Model by Schutte (1998) consists of the work environment.

Schutte (1998) distinguishes two components of the work environment namely the physical work environment and safety intent.

2.3.3.3.1 Physical Work environment

In the first instance the physical work environment consists of safety related dimensions and factors, which can be directly observed and according to Schutte (1998) are known as artefacts. Directly observable dimensions and factors include risk assessments, personal protective equipment, posters, slogans and signs and safety indicators in the workplace. This includes safety graphs indicating injury and severity rates as well as percentage rates for safety compliance, inspection-ratings and good housekeeping ratings.

Safety indicators according to Schutte (1998) are sufficient safety signs, posters and lines (slogans). These largely complement a behavioural approach in terms of continuous risk assessment, behaviour based safety, rewards and recognition for accomplishments and continually conducting workplace conditions assessments for the improvement of ergonomics.

Two safety indicators are distinguished. The first are leading indicators, which are described as metric(s) used to drive and measure activities performed to prevent and control injury, damage and loss (BHP Billiton, 2006). Leading indicators are used proactively (analysis of data to intervene before an incident, unsafe acts and perception survey results, whilst lagging indicators are reactive, for example injury statistics). According to BHP Billiton (2006) lagging indicators (if used as indicator of success) do more harm than good since people are not empowered to take control of safety and develop a climate conducive to safety. Mitchell (2003) asserts that leading indicators are also used to monitor practices that could prevent incidents.
A mix of both leading and lagging indicators are proposed to measure overall safety effectiveness and performance with the aim to continuously improve safety. If one considers an iceberg where the tip is above water and the majority of ice below the water, the above water issues in safety that are visible are fatalities, injuries and incidents. Below the waterline are at risk behaviours resulting in the visible safety (injuries). Schutte (1998) proposes a behavioural approach to the improvement of safety.

The classical stimulus \(\rightarrow\) response theory of behaviour underlies this process. Schutte (1998) proposes the activator \(\rightarrow\) behaviour\(\rightarrow\) consequence process.

(The ABC process to safety improvement)

\[
\begin{align*}
A & \text{ (Activator / antecedents)} \\
\downarrow \\
B & \text{ (Behaviour)} \\
\downarrow \\
C & \text{ (Consequences)}
\end{align*}
\]

Smith (2002) elaborates on the ABC model and proposes the A\(\rightarrow\)B\(\rightarrow\)C\(\rightarrow\)D\(\rightarrow\)E\(\rightarrow\)F model as a learning process to control choice of behaviour regarding activating events.

\[
\begin{align*}
A & \quad \text{- Activating event} \\
\downarrow \\
B & \quad \text{- Choice of behaviour based on ones mindset} \\
\downarrow \\
C & \quad \text{- Consequence of behaviour} \\
\downarrow \\
D & \quad \text{- Learn to dispute ones choice of behaviour that result in the consequence} \\
\downarrow \\
E & \quad \text{- Effective outcome is as a result of the choice of behaviour} \\
\downarrow \\
F & \quad \text{- A new feeling}
\end{align*}
\]

Ellis (as reported by Corey, 1991) developed the rational-emotive therapy (RET) as a cognitive-behavioural approach to counselling psychotherapy. RET is orientated towards cognition \(\rightarrow\) behaviour\(\rightarrow\)action and stress thinking, judging, deciding, analysing and doing and is based on the assumption that cognitions, emotions and behaviours interact significantly and have a reciprocal cause-and-effect relationship.
The ABC theory of personality is described as a process where the counsellor and client work towards transforming an unrealistic, immature and absolute style of thinking into realistic, mature and logic style of thinking and behaving.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>activating events</td>
<td>belief</td>
<td>emotional and behavioural consequence</td>
<td>disputing intervention</td>
<td>effect</td>
<td>new feeling</td>
</tr>
</tbody>
</table>

Through the application of scientific methods, clients are taught to challenge B (Beliefs) through detecting, debating and discrimination irrational beliefs. Through this process F-new feelings are created (resulting eventually in behaviour). The application of this theory is, to the knowledge of the researcher, not applied to behaviour in the safety context but the application is exciting and may lead to further research in this regard suffice to mention that F in behavioural context may mean new behaviour learnt is applied.

Protective Equipment according to Schutte (1998) refers to the condition of protective equipment and clothing. The United States Department of Labor Occupational Safety and Health Administration (2002) describe protective equipment such as hard hats, gloves, glasses as having been designed to protect employees from serious workplace injuries or illness resulting from contact with workplace hazards (e.g. chemical, radiological, electrical).

The South African Mine Health and Safety Act and Regulations Act 29 of 1996 (hereafter the Act) prescribe protective equipment in section 6(1)- (iii) suffice to mention that the onus is on the employer to provide and ensure training in the use of proper protective equipment. Protective equipment application and the use thereof are behavioural by nature. To this end, Schutte (1998) postulates that management must ensure best practices safety systems, leaders are to demonstrate commitment by wearing and using the correct protective equipment, supervisors are to be coached to lead by example and not condone poor protective equipment, teams are to be involved in determining critical behaviours as well as praising employees for compliance in wearing and applying protective equipment.
2.3.3.3.1.1. Safety housekeeping

Schutte (1998) describes safety housekeeping as the state of safety housekeeping in the workplace. Within an underground mining environment, this refers to the workplace (e.g. a stope) the correct support from the face, rig holes according to standards and sweepings (cleaning) according to standard. This ensures an orderly and clean place to work.

According to The Canadian Centre for Occupational Health (1998) housekeeping is more than just cleanliness. It also entails keeping work areas tidy and neat and orderly, maintaining working areas free from slipping, removing waste (spillage) to ensure underground working operations can be hazard free. It also includes underground workplace layouts (ergonomics) and design to ensure workplace safety. The Act prescribes for example in Chapter 13; outlets, ladder ways and travelling ways. These legal requirements find expression in the design of underground workings.

Good housekeeping is an ongoing process. With each underground blasting operation (daily), the total environment changes at the face that necessitates housekeeping. The major benefits of good house keeping are firstly direct safety, but secondly potential and real hazards are exposed that can be acted upon (leading indicators). Schutte (1998) proposes the implementation of best practice safety systems, regular safety and or risk assessments, involving employees in cascading down responsible behaviour, management teams to compete on housekeeping issues and rewarding teams for house-keeping performance.

2.3.3.3.1.2 Safety meetings

Chapter 6 of The Act prescribes Health and Safety Representatives and Committees and entrenches participation of workers in safety related matters. The Act prescribes the election of representatives on health safety committees (Chapter 6.6 – 6.10).

To ensure effective functioning of health and safety meetings Schutte (1998) proposes that safety meetings must be serious in approach, honestly and consistently supported by management, leaders must willingly share information honestly, involving safety representatives in actions and solutions (this implies
listening attentively), execute decisions and creating an environment conducive to participation and contribution. In the case under study, Health and Safety meetings on mines are minuted and actioned.

2.3.3.3.1.3 Safety inspections

Schutte (1998) describes safety inspections as the meaningfulness and regularity of safety inspections. As part of ongoing risk assessments prescribed by the Act in Chapter 5 (i) – (ii), risk assessments also act as safety inspections. Over and above risk assessments, safety inspection checklists for underground occupations guide safety inspections. Over inspections of maintenance jobs also act as safety inspections. The Department of Minerals and Energy also appoint inspectors who have legislated duties (section 49 (1) of the Act) with prosecution powers.

Section 2 of the Act makes provision for the appointment of blasting certificate holders who also have inspection duties for example prior to commencing with work (competent A Persons). Section 2 (15) and 2(17) respectively deals with the appointment of Shiftbosses and Safety Officers who have specific safety duties (including inspections).

Schutte (1998) propagates that safety inspections must not only be meaningful and serious ongoing events, but must also be used as an education process. The person conducting the inspection must also listen attentively to employees and praise contributions and ideas. Success must be rewarded and failure punished in a fair and consistent manner. Employee involvement will ensure that their perceptions and frustrations will be identified.

2.3.3.3.1.4 Recognise safe performance

Schutte (1998) refers to recognising performance as the recognition given for safe performance. This may not be reward, but award (refer to joint governance discussed in remuneration). According to Ivancevich et al (1996), performance evaluation that leads to satisfaction is influenced by both extrinsic and intrinsic rewards. Extrinsic rewards are monetary by nature whilst intrinsic rewards are characterised by task completion, sense of achievement, autonomy and personal growth.
Schutte (1998) proposes the involvement of employees in an honest and open manner in safety performance decisions making. This is underpinned by education and training. Employees engaged in best safety practices are more likely to practice sustainable, safe behaviour. The involvement of employees also requires constant feedback from employees in order to deploy strategies and processes that focus on increased employee safe behaviour.

### 2.3.3.3.1.5 Safety feedback

Safety feedback is a management and supervisory function and refers to the safety feedback given and received regarding safety matters (Schutte 1998). Communication and especially listening skills are imperative since it is that through sharing information that trust is created. Involvement, empowerment and participation in safety matters promote ownership. Sincere appreciation of effort and ideas acts as recognition.

Safety feedback is a process of 1) setting goals 2) managing performance and 3) providing feedback on performance. Reber, Wallin and Chhokar (1990) emphasize the necessity of feedback in relation to goals, which support a behavioural approach to safety improvement.

The Act as discussed above, through the institutionalisation of safety committees, representatives and meetings, facilitates safety feedback through the representative structures (health and safety committees and representatives). One area of creating feedback is through the safety management system applied (leading and lagging indicators discussed earlier) but this is inadequate.

McSween and Lorber (1981) argue that where performance and morale are low, the probability exists that workers are not adequately provided with feedback regarding their performance. Four qualities or characteristics of effective feedback are proposed by McSween et al (1981):

- Feedback should be comprehensive and entail all relevant dimensions of performance.
• Feedback should be meaningful and specific and employees need to understand what each performance measure means and how they, through their actions affect the measure.

• Feedback should be timely as well as frequent enough to maintain steady performance. By making employees responsible for recording their own performance, immediate and frequent feedback is ensured.

• Feedback should reflect performance trends. When performance over a specific time period is part of the feedback process, employees learn to evaluate the effectiveness of their work habits as well as the importance of their efforts. This may include trend graphs.

McSween et al (1981), suggest that an effective feedback system has two components namely 1) an objective measurement system and 2) supervisor(s) who discuss (es) the performance data with employees.

McSween et al (1981), state that the core to any effective feedback system is an effective performance management system. Four steps to creating a performance feedback system are proposed namely:

1) Analysing information needs. Who needs information where, how and when

2) Develop the administrative processes to collect the information (forms and procedures)

3) Pilot-test the system through completing forms, collecting the data and ask people for comments regarding the usefulness.

4) Implementing the feedback system through relevant training to all regarding the use. Implementing also entails evaluating the feedback system after a period of time to assess effectiveness.

Odendaal et al (2003) state that people will improve when they receive feedback on their performance or progress in achieving a goal since feedback assists in identifying a gap between expected and real performance. Feedback in this instance acts in guiding behaviour.
McSween et al (1981) warn against a subjective feedback system where poor performers are identified and singled out for blame. The effective feedback system must be accompanied by adequate management training in reacting to the information, training in behavioural recognition and appreciation for performance to standards and ways to work with employees to correct problems. The objective of the effective feedback system is to improve morale and increase motivation.

2.3.3.3.1.6 Safe working conditions

Schutte (1998) describes safe working conditions as the effect that physical working conditions have on employees to encourage them to work safer. In the South African mining industry the Act not only regulates the safety aspect on mines, but includes the health component as well (The Mine Health and Safety Act). The health component refers to the sound state of the body (physical) and mind (mental) of the workers that enable them to perform a job normally.

The Bureau of Working Conditions from the Department of Labour in the Republic of the Philippines (2003) refers to safety in the workplace as the physical and environmental conditions of work, which comply with presented Occupational Safety and Health Standards and allows employees to work within or without acceptable exposure to hazards.

In the South African mining environment the Act also prescribes mandatory rules and practices to ensure both safety and health. For employees this means that the employer must ensure the effective protection against the danger of injury, ill health (sickness) or death through safe and healthy working conditions. (The Act covers e.g. mining layouts (Chapter 17), machinery and equipment (Chapter 8), outlets (Chapter 13), ladder ways and travelling, fires and explosions (Chapter 5) and rescue operations (Chapter 16).

As mentioned earlier, the Act prescribes participation in health and safety matters through representative committees (which is a Unionised environment and shop stewards). Through the statutory appointment of blasting ticket holders, shift-bosses and safety officers (referred to previously), specific duties and responsibilities are assigned to not only ensure safe working conditions and practices in underground
working areas but also the involvement of employees in safety and health issues. The behavioural aspect of health and safety cannot be over emphasised.

Management are to over inspect workings, the use of ergonomic (ventilation specialist) and environmental specialists assist to evaluate working conditions and through representative structures employees contribute to health and safety. The key is involvement of employees and to use praise and award (not monetary reward) for performance achieved in health and safety.

2.3.3.1.7 Understanding Safety Goals

Schutte (1998) describes safety goals as the level of understanding regarding the health and safety plans and objectives of the organisation. This interlinks with the feedback system and conditions for effective feedback discussed earlier.

Odendaal et al (2003) describe motivation as the processes that reflect on individual's intensity, direction and existence of effort towards attaining a specific goal. Without motivation there can be no goal attainment. Intensity refers to how hard an individual tries, direction entails the quality of effort applied and persistence is how long an individual can apply effort.

A key ingredient in goal setting is participation. Odendaal et al (2003) argue that in terms of goal-setting theory, participation improves the individual's agreement and action, even in difficult goals. Self-efficacy or the belief of a person that he/she is able of performing a task is closely related to goal setting.

Odendaal et al (2003) assert that where interdependence in achievement is at stake, group goals are preferable. Goal setting is also culture bound. Comparing individual (goals) in independent culture vs group (goals) in interdependent culture, expectancy of performance is high in both managers and employees, both of whom seek challenging goals.

The creation of understanding safety goals is based on effective two-way communication. Schutte (1998) identifies top-down communications where managers (supervisors) talk and explain organisation safety goals to employees.
Eliciting and obtaining feedback and or suggestions from employees regarding processes to achieve safety goals is a bottom up process.

Explaining the rationale behind decisions create understanding which assists commitment to safety goals. Evaluating and testing understanding of safety goals in an ongoing manner facilitates communication and recognises contribution whilst commitment enhances motivation.

2.3.3.3.2 Safety intent

Safety intent is described as the perceived state of supportive relationships in work context (Schutte 1998). Safety intent reflects the perception of an employee(s) regarding management support, care, openness and commitment towards employee involvement in workplace matters including safety conditions, safety meetings and safety-critical matters. Schutte (1998) argues that this perception has a direct bearing on the mind-set of employee(s) and therefore contributes to employees' current behaviour.

Trust amongst employees, communication, management support and involvement in safety matters, friendly atmosphere and valued human beings are associated with safety intent (Schutte, 1998).

2.3.3.3.2.1 Trust among employees

Schutte (1998) defines trust as the level of trust mutually established between all employees. Two aspects play a role in the creation of trust amongst employees. Firstly, management plays a role through involving employees meaningfully and continually in job and safety related matters by communicating honestly and caringly, respectfully listening to employees and responding appropriately by facilitating teamwork and acting with integrity. The second aspect relates to trust amongst employees themselves. Buist (2006) postulates that accepting accountability and responsibility builds trust. Where team members rely on each other (interdependent) for a mutual outcome, every member needs to act out his or her accountability and responsibility.
By putting one's trust in someone else one becomes vulnerable and this entails risk. The risk is that the person trusted will affect the desired or anticipated outcome (on which the trust is based). In the mining environment this means that a team member responsible for installing support is trusted by fellow team members to install the support to standard and safeguard their lives, and the member will act as expected, thereby fostering interpersonal / inter team trust.

Bloch (2004) postulates that being able to listen to other members, assists with a process of reconciliation. Listening to other people's views and arguments also portrays respect to the other persons, which is a key ingredient in building interpersonal trust.

Messina and Messina (2006) describe interpersonal trust as:

- Letting others know one's feelings through respect
- Confidentiality
- No reprision for mistakes
- Being able to let others into one's life in order to create a mutual relationship built on mutual respect, care and concern for each other
- Opening oneself up without being ostracised
- Being vulnerable by relying on others to treat one in a fair, open and honest manner

Messina et al (2006) argue that people will have trouble in developing trust if they:

- Experienced emotional and/or physical abuse (hurt)
- Are constantly belittled and put down
- Have a low self-esteem and
- Experienced non provoked victimisation

Messina et al (2006) offer behavioural traits for people to develop trust:

- Hope in the goodness of mankind
- Faith in the fairness of life
- A healing environment free of blame and accusation
- Address negative self scripts
• Be open to others (take risk)
• Becoming vulnerable
• Letting go of fear and
• Self-acceptance.

2.3.3.3.2.2 Communication

Schutte (1998) describes communication as the impact that a team builder has on employees. This is inherently a vertical process per se where the leader creates a clear, coherent and compelling vision, communicates it excitingly for teams to digest, promotes and lives the essence of what is communicated. Schutte (1998) promotes the development of high impact communication sessions that inspire people and teams, honest and open communication, listening with sincerity and dignity and utilising all sources (written, electronic) to communicate clearly whilst keeping upward communication open. An additional aspect is diagonal communication, especially in project teams (safety) or sharing an experience with other organisation members. This facilitates learning according to Ivancevich et al (1996).

2.3.3.3.2.3 Management support

Schutte (1998) describes management support as the level of support experienced from management to perform a safer job. According to the Oklahoma Department of Labor (2006) management support manifests itself in the commitment demonstrated for the health and safety programme. The specific management duties and responsibilities to make the safety system work must be clearly defined by training all levels to ensure effective functioning of the safety system and equipping employees with the skills to perform safely.

In the mining context the continuous evaluation of risk and auditing of safety systems ensure management support as well. Support from management also includes sufficient resources allocated (including funding), hazard and incident analyses as well as setting and reviewing operating standards continuously.
Occupational stress and the influence thereof on health and safety have been addressed.

According to the Wyre Borough Council (2006) stress is a reaction to excessive demands or pressures and in the work context stress arises when a person attempts to cope with tasks, responsibilities or other pressures connected to the job, but experience difficulty, strain or worry in the process. Stress triggers changes in the body’s processes resulting in physiological and behavioural changes and differ from person to person (The Wyre Borough Council, 2006).

The Wyre Borough Council (2006) identifies aspects at work that may give rise to stress namely 1) Organisation culture 2) Role in the organisation 3) Career development 4) Job design 5) Workload and work schedules. Considering the above, management has a role to play in all the aspects mentioned above and needs to address these aspects not only to ensure optimal performance, but through positively addressing these issues the potential for stress is also limited.

Schutte (1998) proposes management behaviours that would constitute management support. Management must lead by example – doing the right things right (zero tolerance), demonstrate sincere interest in the safety of employees through personal and team development, openly praise safety compliance and achievement and involve employees meaningfully in safety related matters.

2.3.3.3.2.4 Involvement in safety matters

Schutte (1998) describes involvement in safety matters as the extent to which employees are involved when decisions are made regarding health and safety matters.

As has been stated the Act entrenches employee participation in health and safety matters through inter alia safety representatives and health and safety committees (chapters 30 and 34 respectively). Although not directly specified in the Act, in a unionised environment representatives are in fact shop stewards.

Bell and Phelps (2001) offer five main areas for employee involvement in health and safety matters:
Policy
Worker involvement in development or reviews of policy statement

Planning
- Objectives. Employee involvement in setting health and safety plans and objectives
- Risk assessments. Involve employees in establishing and assessing risks
- Procurement. Employee involvement in material or equipment procurement
- Design. Involvement of employees in new work design
- Problem solving. Involve employees in problem solving and train employees in techniques or steps and
- Risk control system. Involve employees up front in the design.

Organising
- Control. Giving employees specific health and safety responsibilities
- Communication. Involve employees in conveying messages regarding health and safety issues
- Competence. Involve employees in design and delivery of training and
- Co-operation. Structure safety committees for co-operation and implement suggestions schemes.

Measurement
- Active monitoring. Involve employees in observational inspections.
- Re-active monitoring. Involve employees in hazard spotting, near miss investigations and incident/accident analysis.

Audit and Review. Involve employees in audits of efficiency, effectiveness and reliability of the Health and Safety System.

Ariss (2003), reasons that the involvement of employees to improve safety in the workplace is an ethical imperative. Management has a responsibility to assist workers to reduce incidents and injuries as well as consider the needs and rights of employees when making decisions that affect them. Employee participation is a double-edged sword. Firstly it assists to solve safety problems that are ethical, but allowing employees to participate is ethical in it.
Schutte (1998) proposes the following managerial strategies to affect employee involvement in health and safety matters.

- Implement structures to effectively involve employees.
- Use meetings to elicit responses from employees and respectfully listen to contributions.
- Encourage contributions and respectfully respond.
- Develop employees' technical and behavioural skills to contribute in a sustainable manner.
- Reward and recognise contributions constantly.

2.3.3.3.2.5 Friendly atmosphere

Schutte (1998) refers to a friendly atmosphere as the warmth and friendliness that employees experience in the workplace.

The State Services Commission in New Zealand (2003) describes a friendly work atmosphere as free from victimisation, sexual and racial harassment, bullying, and the right to dignity at work, codes of conduct, performance management, maintaining fair discipline, training for managers and assertive behaviour as ways and means to create a friendly atmosphere. A friendly atmosphere at work does not only mean smiles and polite greetings. Certain organisational processes and leader mindsets create a friendly work atmosphere. Forson and Keys (2002) argue that creating a collaborative workplace is preferable to the hierarchical control based organisation.

A collaborative work environment has a tolerance for mistakes (this does not mean doing nothing about them) but engaging people to find root causes and actions (learning) to improve. This stimulates innovation and leaders must actively engage people, listen to contributions and analyse processes and results, act with empathy and share ideas. Admitting mistakes by leaders portrays self-confidence and honesty, which assist to forge closer ties with employees and colleagues.

The physical environment also needs to be friendly to enable employees to perform safely. This means a safe environment, free of hazards (the hazards are managed through applied risk management) through an applied safety system that contributes
to safe performance (Environment, 2006). A friendly work atmosphere is also created through sound relations at work. Collective agreements that regulate relationships, codes of conduct or ethics and disciplinary and grievance procedures also contribute to maintain good order and relationships in the work context as well as promote a friendly work environment (The University of Victoria Canada, 2006).

A friendly work atmosphere is created through leader and manager actions, safety and health systems sound employee relations, agreements and practices thus contributing to a positive work climate.

2.3.3.3.2.6 Valued human beings

Schutte (1998) describes valued employees as the degree to which employees feel valued as human beings, feel self-worthy and self-pride.

According to Richardson (2004) the turbulent economics in the world require two aspects to be addressed for success. The first relates to being able to manage change and secondly the development of leaders in the organisation. Leaders inspire people and create employee loyalty through engagement. Employees need to be equipped with skills and competencies to enable them to compete effectively.

Through monitoring programmes employees (especially talented employees) are developed. They experience the confidence in themselves through the investment made by the organisation. Richardson (2004) argues that two-way communication is the key to effective engagement of employees. Stone (2006) confirms the earlier argument of Schutte (1998) that leaders need to connect individual goals with organisational goals and strategy. When employees feel they contribute to the success of the organisation they feel valued. According to Stone (2006) communication regarding the state of the business and employee contribution motivates employees.

Stone (2006), states that Herzbergs' Two Factor Theory separates 'motivational' factors from 'hygiene' factors. The hygiene factors are foundational requirements for an employee to feel valued namely salary, working conditions and status. Stone (2006) concludes that being valued is closely related to motivation, since the
absence of the factors such as salary, working conditions and status undermines motivation whereas growth opportunities, recognition for achievement and the need to make a difference or leave a legacy has the opposite effect.

In addition Schutte (1998) proposes involvement of employees in safety related matters, fair and respectful treatment, honest appreciation of efforts and showing care can contribute to employees feeling valued. Safety climate is a psychological phenomenon since it reflects attitudes towards the job and company. These attitudes find expression in behaviour. In addition the perceived physical work environment (which is subject to change depending intervention) and safety intent which reflect the perceived state of supportive relationships, also function as psychological factors that have a direct bearing on the mindset of the employee resulting in current behaviour.

Organisational climate is not as permanent as organisational culture and reflects relative instability and subject to change compared with organisational culture, which is discussed next.

2.3.4 Culture: Behaviour in Company context

2.3.4.1 Introduction
The concept of organisational culture and the role that corporate has to play to establish an organisational culture has been discussed in the model of the world-class organisation.

Prior to developing an organisational culture Martins and Martins (2003) postulate that organisational culture develops out of the institutionalisation of an organisation. When an organisation is formed (institutionalised) it starts with a process of forming an identity and taking on a personality of its own (similar to human beings). Institutionalisation also has the effect that an organisation is not only valued for the goods or services it provides, but also for itself, what it stands for and how it functions. This, according to Martins et al (2003) provides members with common understandings of what is appropriate and meaningful behaviour. Organisational culture develops through this process.
Organisational culture differs from one organisation to another since the shared meaning amongst individuals that Schein (1985) describes as organisational culture, are interpreted and exercised differently from one organisation to another.

In this chapter organisational culture will be discussed from its nature, factors that determine formation and choice of culture, role and importance, functions of culture, culture and organisational safety and integrating culture and organisational safety perspectives. The two aspects of values and beliefs will conclude the discussion.

2.3.4.2 The nature of organisational culture

Schein (1985) defines culture as a pattern of basic assumptions – invented, discovered and developed by a given group as it learns to cope with its problems of external adaptation and internal integration – that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to problems.

Considering this definition as relating to groups, learning takes place in group context. Adaptation presupposes a behaviour process to adopt externally and to integrate internally. The behavioural view of organisation culture is vested in the Social Learning Theory proposed by Bandura (1996) according to Manage Change (1998). Learning takes place through both direct and indirect means. Learning on the direct level takes place when, for example a manager interacts with people and they experience first hand how they are being treated during his interaction. Indirect learning takes place when the people interpret the way they are being treated by observing management’s treatment of other people. This results in perceptions.

According to Manage Change (1998), behaviour consists of two components namely norms and patterns of behaviour. Norms are internalised views of how to behave which are reflected in patterns of behaviour which are the external, visible manifestations of internalised views. Organisational culture thus manifests itself on two levels. Van Aardt (1995) confirms this viewpoint and states that on the visible level, norms direct group behaviour and define the expected behaviours to which individuals need to conform. Shared values function on the invisible level and direct
behaviour. Van Aardt (1995) postulates that when the organisational values emphasise the importance of the management of occupational safety, it would be reflected in the behaviour of employees.

Schein (1985) identifies a third level of organisational culture functioning namely mentifacts that function on a pre-awareness level where basic assumptions function. It is related to the invisible level in that it also determines behaviour.

Schutte (1998) postulates that these intangibles, reasons behind behaviours, unquestioned rules, unstated or unconscious beliefs and assumptions taken for granted are collectively named culture and finds expression in 'the way we do things here'. Artefacts are important since it finds expression in both the visible and invisible level and according to Leadership Paradigms (2006) can be either tangible or intangible.

The Queensland Government (Department of Employment and Industrial Relations, 2007) describe artefacts that reflect the organisational culture as the characteristics of an organisation that reflect and support the culture. The key artefacts are values and norms.

On the visible level artefacts are expressed for example office layouts that reflect work teams (open plan offices) and open doors and even dress codes. On the invisible level Dahl (2006) states culture acts as an invisible control mechanism operating in one's thoughts. This eventually finds expression in behaviour. The reward policy of an organisation is an expression of the values and norms and is a powerful medium of conveying a message of performance (performance based pay).

According to the Queensland Government (2007) culture artefacts are also myths and sagas about people and company successes, symbols and rituals as well as ceremonies. Robbins (1996) argues that strong cultures are difficult to change since one function of culture is to interpret the external environment into internal processes and structures. Culture act as protection of the organisation and when strongly developed will resist change. Dahl (2006) emphasises an additional nature of
organisational culture in that it is learned and does not form part of the human nature where character and personality is vested.

Since culture is shared meaning by individuals in a group, this shared meaning evolves through influencing members' behaviour and interpretations of the meaning of other members' behaviour. According to Spencer-Oatey (2000) this is learned through interaction with one's social environment and is different from human nature (inherited through genes) and personality (traits).

Spencer-Oatey (2000), postulates that culture manifests itself in different layers of depth (like an onion) and contains both visible and invisible elements as in the figure below.

---

Figure 2-29: Manifestations of Culture at Differing Layers of Depth. (Source: Spencer-Oatey, 2000. Adapted from Hofstede, 1991, and Trompenaars and Hampden-Turner, 1997)

The outer layer, comprising artefacts and products (e.g. food, offices, clothing and language) as well as rituals and behaviour (gestures, ceremonies, ways of greeting).
The second layer consists of systems and institutions (government, law and order, family life).

The third layer is more implicit and comprises beliefs, attitude and conventions (religious and moral beliefs, attitudes towards people of groups and concepts of behaviour, politeness or impoliteness).

The fourth layer and inner layer contain the core of implicit aspect of culture namely values and beliefs (importance of conforming behaviour to social expectations and norms, respecting tradition).

The nature of culture on the visible and invisible level has been discussed.

Spencer-Oatey (2000) offers ten aspects that reflect the nature of organisational culture.

- **Culture affects behaviour and interpretations of behaviour**
  Since certain aspects of culture are visible, their meaning is invisible. The gesture for example in forming a ring with ones thumb and forefinger may be construed as approval or excellence for some but for people in the Mediterranean countries it may be construed as obscene.

- **Culture can be differentiated from both universal human nature and unique individual personality**
  Since culture is learned through interaction with one's social environment, it differs from human nature that is inherited and personality (traits), which are inherited and learned.

- **Culture influences biological processes**
  Since all people need food to eat, what one eats, when one eats and with whom in what manner, is determined by culture through learning and interacting with other members of one's culture. Even how much one eats is determined in the same manner. This shows conscious behaviour.
Firewalkers in Fijian society do not experience pain or even blisters. International learning from this culture results in biologically suppressed pain. The term 'cowboys don't cry' is also an example of culture influencing a biological process (tears).

- **Culture is associated with social groups**

  In terms of the definition provided by Schein (1985), culture is not primarily on the individual level, but has to do with groups that are formed through the collective gathering of individuals. The group, through a process of learning how to behave, through adaptation and integration develop patterns of perceiving, thinking and feeling with regards to problems and so survives and progresses (Manage Change, 1998).

  Social groups do not only function in organisational context. Different types of social groups exist for example the local book reading club or the care group at church or the sports club. These groups have different objectives and goals, but are social groups. An employee that belongs to one or more of these mentioned groups thus have a multicultural membership. These groups may have a culture or develop one over time. This presupposes sub cultures within societal culture. The ANC Youth League and Woman's League are examples of sub cultures functioning within a broader culture.

- **Culture is both an individual and social construct**

  From a psychological point of view culture is extremely individualised. The practices of sangomas as traditional healers confirm this phenomenon. Although culture is a group process, it directs individual behaviour to act in accordance with values, beliefs and expected behaviour(s). The interesting aspect is that it differs to a degree from individual to individual.

- **Culture is both psychologically and socially distributed in a group**

  From a psychological perspective no two individuals share culture perfectly even. The reason lies in the inside of each individual. The internalisation of culture may vary and even behaviour may be different to various degrees to a specific cultural issue from one individual to another.
Spencer-Oatey (2000) refers to this phenomenon as culture being causal since the varying degree of internalization, motivates different behaviour in two individuals. Cognition and affect (reason and emotion) is in the mind of every individual. This explains the reason for individual differences in internalisation and emotion that reflects in behaviour.

In the social context two individuals may differ in sharing cultural content. Although originating from the same ethnic population being geographically separated from 'home' and operating in a cosmopolitan environment may result in an individual not sharing culture as intensely as another being at 'home'.

- **Culture has both universal and distinctive elements**
  All human beings feel closer to people they see as (family and next of kin) similar to them in comparison to those they perceive as different to them.

  During an introduction or conversation, looking at people (universal aspect) has distinctive elements in various cultures. While looking the other people in the eye and making eye contact is perceived as confidence and engaging, in some cultures it reflects disrespect and, depending on status, eye contact may be avoided. In the African cultures elders greet first to show willingness to talk or show recognition. In other cultures it is perceived as impoliteness (disrespect) if elders are not greeted first.

- **Culture is learned**
  Since culture is a group phenomenon it is transferred to the individual through interaction and socialising. Dahl (2006), avers that culture acts as an interpretive frame of behaviour. The individual interprets a given situation and through norms and values learnt, apply behaviour which is culture driven (conform to norms, values or rituals). Culture thus directs behaviour. Two processes can be distinguished. The learning process provides a form of reference for interpretation that directs behaviour.

  Spencer-Oatey (2000) qualifies the term 'learned' as modified by the influence of collective programming and unique personal experiences. The fact that culture is
learned presupposes it could be unlearned or changed but as has been stated before, in strong cultures this is difficult.

Spence r- Oatey (2000) postulates culture is also taught from parent to child, such as appropriate manners (in a culture) and behaviour. This acts as a set of interpretations that guides behaviour. Gonzalez (2001), states that organisational cultures are systems within systems and capable of self - preservation and self - adaptation to modifications and demands that manifest in the broader context within which a culture operates. The capacity to adapt is dependent on learning capacity. Learning assists in self - transformation and innovation (Gonzalez, 2001).

Organisation not only have the ability to learn, but also to unlearn (discontinue learning) and Gonzalez (2001) postulates four forces that are simultaneously present in organisational culture, namely self-preservation, self-adaptation, self-transcendence and self-dissolution. The latter occurs once an organisation has fulfilled its mission.

- **Culture is subject to gradual change**
  
  Spencer-Oatey (2000), states that all cultures are adapting as a result of globalisation and the influence of technology. The change is not always fast, but gradually. The importance of business leaders operating globally to under-stand the cultures within which they operate is a business imperative. Fast or rapid culture changes according to Robbins (1996), occurs in crisis situations.

  To change culture, Spencer - Oatey (2000) advises that a thorough assessment of the types of things, ideas and behaviour that have been incorporated recently into a culture need to be conducted, since strategic planners must consider and understand these to the extent of relative ease or difficulty changes incurred in workplace behaviour would be successful.

  Although all cultures change over time, not all cultures change in the same manner. Spencer - Oatey (2000) states culture changes through two processes namely cultural innovation and diffusion. Innovation occurs when new thoughts, norms or material items are introduced through both internal and external forces. The
mechanisms of change that operate within a given culture are called discovery and invention. Diffusion refers to borrowing from other culture(s) and adopting into one's own culture. This process however is a selective process of what will be useful or not. The process is also a two-way process in that influences take place in both directions (giving and accepting).

- **Various parts of culture interrelated**
  Since cultures are organised systems where some components are related to other components, these components are integrated into culture and cognizance must be taken of changing components that affect other components.

Conzalez (2001) postulates that visible changes in organisational culture need to affect systems of meaning, mental models, practice and behaviour, structures, guidelines and procedures to be lasting and deep rooted. The system of values and beliefs, assumptions and mental models which function on the invisible level ultimately determine what and the way things are done. It has been stated previously that culture is a descriptive concept and differs from climate, which is an evaluative concept. Both however influence behaviour. Culture directs behaviour whilst climate (through attitudes) individually influences behaviour.

### 2.3.4.3 Factors that determine formation and choice of culture

The institutionalisation of an organisation triggers the process of creating organisational culture. An organisational culture does not come into being and does not develop haphazardly.

Robbins (1996) traces the origins from organisational culture to the founders of the organisation who impact on the formation of the culture through a vision and mission of what the organisation should be. According to Van Aardt (1995), organisational culture develops through six factors that influence one another to a lesser or greater extent. These are the external environment, the maintenance of boundaries, differentiation and integration, role of leaders in the organisation and impact of the group.

- **The external environment**
The political, legal, technological, educational and social subsystems that exert
demands and expectations of an organisation have to be considered. These
considerations find expression in organisational strategies and strategic plans
through strength and weaknesses, (external environment) evaluation.

The roles of communities and environmental protection regulations have been
discussed. The corporate governance and sustainable development reports are
all influences from the external environment impacting on an organisation for
example a mine. The changes in the culture of the organisation with regards to
the above mentioned issues is a direct result of external pressure which, in
causes of non compliance could lead to the license to mine being withdrawn. The
different role players in the external environment also impact on the culture within
the organisation.

The inspectors of the Department of Minerals and Energy have specific powers
and duties with regards to The Act. This includes suspension of mining activities
in certain circumstances.

• **Boundary Maintenance**

Organisational culture is an open system, which allows influences from the
external environment. The degree to which influences are allowed is determined
by the organisation and is critical for the continuation of an organisation. New
business philosophies and ideas are primarily obtained through consultants,
external training initiatives, benchmarking exercises and interactions with
stakeholders.

It is important to keep abreast of occupational health and safety developments
and mining engineers are represented in The South African Chamber of Mines
Associations on national and regional level to transfer new developments into
safe mining practices. This assists to maintain balance in technology and work
practices and what is allowed from the external environment to the organisation.
Although discussed here, the boundary-defining role also acts as a function of
culture according to Robbins (1996).
• **Differentiation**

One of the key characteristics of organisations is functional specialization, which results in vertical and horizontal differentiation with groups in the organisation having different objectives and tasks. This results in the formation of subcultures within an organisation requiring from the organisational culture to be heterogeneous (diverse in character and content) which places additional pressure on the safety department to provide a service to these various departments and groups from a policy and procedural framework.

• **Integration**

Van Aardt (1995) postulates that to expect that the articulation of values will lead to integration is insufficient. The systems within the organisation need to be structured in order to complement the desired behaviours. Communication, remuneration, risk management and control systems are examples of systems that need to be structured to elicit the desired behaviours.

Van Aardt (1995) identifies communication as the binding factor that keeps organisations together and values are shared through interacting and communication. Inadequate integration results in values not being integrated. Frequently what happens in the organisational context is contrary to what is articulated. When employees are valued, performance management systems, respect and trust must support this value. The way people’s ideas are elicited to ensure involvement and commitment will reflect in their behaviour.

Van Aardt (1995) emphasises that in occupational safety context, what management does is far more important than what is said. The integration process is enforced or resisted through the level of commitment and identification that employees express.

Positive attitudes towards occupational safety in the organisation will result in integrated safety values. With regards to occupational safety van Aardt (1995)
postulates that the stronger integrated the values are, the greater the chances that positive attitudes toward safety will result.

• **Role of leader(s) in the organisation**

Leadership has been discussed extensively within the World-Class Model. The prevailing culture within an organisation is supported by the intensity of the leaders' values, just as the vision of the future influences followers positively (Van Aardt, 1995). This is associated with a management philosophy and the stronger developed, the better the leader will act as role model.

Because leaders control the resources to affect organisation strategy they can play an important role in establishing a desired culture. The recruitment, remuneration structure and strategies of the organisation are powerful resources to establish a culture. Through the reactions of leaders to crisis, what they emphasise, demonstrate, the way they recruit and train, reward and punish are all contribution to establish culture (Schein, 1985).

• **Impact of the group**

Van Aardt (1995) postulates that groups develop shared values to firstly adapt to the external environment as well as to integrate the internal environment. The development of subgroups within groups also contributes to either sharing of the values of the main group or the subgroups may develop their own shared values which may be in contradiction with the main group. The importance of subgroups can therefore not be over emphasised. Van Aardt (1995) states the longer a group functions with success, the stronger a culture will develop and function.

Manage Change (1998) however argues that strong cultures can be counterproductive and in certain circumstances actually hinder performance. The example of an autocratic culture in a market which, requires speed of delivery and flexible systems (service industry) would not suffice. The type of culture required should actually be the desired culture in the circumstances of operation. This philosophy is supported by Alvarez (1983), as reported by Manage Change
(1998) in that there is positive value in aligning organisational culture with business objectives and strategies.

From an individual perspective though, it is important to note that individuals do not create culture in large organisations. Individuals identify with a culture through shared values, norms and behaviours, assumptions and beliefs and this affects performance (Manage Change, 1998).

2.3.4.4 Role and importance of culture

Organisations are not stale, passive and non adaptive. In fact some texts compare organisations with living organisms that are continually adapting and positioning themselves in their environment (van Aardt 1995 and Gonzalez 2001). Through continuous pressures from both the external and internal environment, organisations maintain equilibrium for survival and progress (van Aardt 1995). Gonzalez (2001) postulates that organisations are ecological and self-regulated systems that have the capacity of self-repair, they are linked to their environment (ecological) and the various organisation components are interrelated and interdependent.

Within the organisation, the visible and invisible aspects pertaining to organisational culture have been discussed. Gonzalez (2001) in addition identifies both external and internal aspects with regards to culture within an organisation. The external aspects, which are visible and observable, are individual behaviours, expressed values, artefacts and documents. The internal aspects are meanings, beliefs, attitudes, internalised values and assumptions. As was discussed previously the external aspects are explored through observation and the internal aspects through interpretation.

Van Aardt (1995) postulates that equilibrium between external and internal aspects are maintained through values and basic assumptions, which are in turn, influenced by culture. Organisations consist of five subsystems which function within a contextualised and task environment. The contextualised environment is the external environment (political, legal, demographics) and the task environment (consist of competitors, stakeholders, corporate office, unions). Material, capital, labour and information are inputs into the system, which consist of people and groups,
objectives and values, technical, structural and management system that overlaps (binds) the four afore-mentioned systems. The outputs are profits, satisfaction, safety and growth.

With regards to occupational safety Van Aardt (1995) postulates that the objectives and values subsystem should address safety through mission, vision, strategy and objectives. People and groups represent the attitudes, perceptions, motivation, communication interpersonal relationships, human resources and leadership. When people are not motivated through a culture and or climate, negative attitudes and behaviours towards safety will prevail.

The technological subsystem refers to the application of expertise, techniques and facilities.

The structural subsystem refers to the manner in which tasks are distributed in organisational context. Authority structures, workflow and communication networks are vested in this subsystem. It is here where occupational safety is vested and coordinated.

The managerial subsystem attempts to align the organisation with the environment in which it operates through mission, vision, objectives, and detailed operational plans, erecting of structure, control processes and the management of human resources. Since the management subsystem overlaps the other four systems, it stands to reason that when health and safety is articulated in the objectives and mission, it must reflect in the management system through integrated processes and systems. The visible reflections of occupational safety into the management subsystem determine the ultimate importance of the safety message that is communicated to employees.

Van Aardt (1995) postulates that, according to the structural-functional approach to organisations, the five subsystems mentioned have specific functions (some are interrelated) to ensure the continued existence of the organisation. In this regard, cognisance must be taken of two sets of variables. The first variable is the objective and value subsystem as well as the technological subsystem, which relate to the
survival of the organisation within the external environment. The second variable is the integration between people and groups as well as structural subsystems.

Organisational culture, which is the building block for the realisation of the five subsystems, is manifested through behaviours and attitudes through which the five subsystems will function (Van Aardt 1995).

In a study conducted in the South African Mining Industry in the last decade of the previous century, van Aardt (1995) reports that, within four value categories namely power distance, uncertainty avoidance, individualism and masculinity, emphasis was on all four. Centralisation was strongly associated with power distance and with highly differentiated salaries in all levels and low educational levels of lower levels in the organisation. The latter is still prevailing currently and Adult Basic Education and Training is a high priority within the Mining Charter and Social and Labour Plans. Uncertainty avoidance, which is characterised by task oriented management with little scope for decision - making and risk decision - making also impacted negatively on the organisation.

Individualism is expressed to the extent workers are expected to act on their own behalf and have direct family interest at heart. This is contrary to collectivism where the individual is expected to act predominantly as a member of the group or organisation. In individualistic organisations, every contribution is thoroughly determined and organisation politics are rife. Although there is an apparent positive relationship between management and employees, the relations amongst employees are generally poor.

In masculine organisations (like the mining-industry) a high premium is placed on individual success, self - assertiveness, personal belongings and money. In contrast, more feminine characteristics of collective orientation, where organisations care for employees like in a family, quality of life and caring support of employees are present.

In addition Hofstede (1990) adds another dimension to culture namely long versus short term orientation. The dimension of future prospects has been discussed in the
section addressing relationship credibility and ownership, suffice to mention that long term vision is associated with the future, where thrift and perseverance is valued (The Wikipedia Free Encyclopedia 2007c). A desired safety culture group with cohesion and care as principles will have to be cultivated and consciously created. This is a function of leadership from the top to the lowest level.

2.3.4.5. Function of organisational culture

Organisational culture has often been described as the glue that keeps an organisation together. Van Aardt (1995) postulates that organisational culture has two distinct functions namely maintenance of a healthy organisation and adapting to the external environment.

Robbins (1996) distinguishes five functions of organisational culture.

- **Boundary-defining role**
  This aspect was discussed above. This creates definite distinctions between organisations.

- **Create a sense of identity for organisation members.**
  This is a function that falls within the maintenance of a healthy organisation. Van Aardt (1995), reasons that organisational culture must bind the individuals in the organisation to such an extent that the organisation functions effectively. Organisational culture provides the identity and collective commitment that is crucial for stability in an organisation. The manner in which underlying values are integrated into occupational safety will determine the effectiveness of occupation safety in the workplace (Van Aardt, 1995).

  Van Aardt (1995) emphasises the impact of groups in the organisation and stresses the importance of uniform integration of safety values. Subcultures form, which operate in a way that is contradictory to these values when integration is not ensured.

- **Culture creates commitment.**
Robbins (1996) postulates in the third instance that culture generates commitment to something larger than self-interest. Since culture is the factor that determines the uniqueness an organisation, Van Aardt (1995) declares that the higher the level of identity within an organisation, the greater the commitment amongst employees towards organisational goals and values.

The identification culminates into ownership that results in commitment to practices, procedures and processes within the organisation.

A close relationship between organisational commitment and results exist according to Van Aardt (1995) and, within a safety management programme, determine the effectiveness and quality of a safety management programme. Different meanings are perceived by the concept of commitment; it refers essentially to a psychological tie between employee and the organisation (Van Aardt, 1995).

Commitment can be explained in terms of three types of commitment, namely moral, calculated and estranged commitment (Van Aardt, 1995). Both moral and estranged commitment functions on the affective or emotional level. Moral commitment is characterised by the acceptance of and identification with organisational objectives. The integration of the values resides in the pre-awareness level. No violation of safety rules will occur since the frame of reference rejects such behaviour. Calculated commitment refers to the instrumental view of commitment that is related to exchange theory where commitment is exchanged for something (for example money). Benefits for the individual drive behaviour. The commitment disappears when the benefits fade. Estranged commitment is closely related to the control framework within the organisation. When the organisation is unable to exercise control over occupational safety, the result is estranged commitment. Neither positive nor negative behaviour modelling will have any effect. The integrated approach to occupational safety requires that occupational safety becomes a way of life.

Van Aardt (1995) confirmed that research by Hickman and Silva (1989) established that an organisational culture is established through the development of people skills in three phases namely:
• Establish a commitment to common values
• Reinforce behaviour that support established values and
• Continued focus on the values throughout the organisation.

These three elements are prerequisites to establishing a high occupational safety performance culture that manifests in the occupational safety objectives being self-evident. Van Aardt (1995) suggests that commitment develops through a three-phased process. In the first phase the individual is obliging because a financial reward is at stake (personal gain). The identification takes place in phase two where the individual accepts the values to ensure a satisfactory relationship with the organisation. In phase three the values are internalised when the organisational values are intrinsic beneficial to the individual and congruent with own personal values.

Through the process of interactive socialising, leaders apply social pressure on employees to accept and live the values of the organisation.

2.3.4.5.1 Establishing standards.

Van Aardt (1995) postulates establishing standards for decision-making is an inherent part of organisational culture. Within these parameters of decision-making, lie boundaries of what is allowed and not, reward and punishment for non-conformance to values and norms. When occupational safety rules are not adhered to and not enforced, a culture of non-compliance develops. The opposite is also true.

Encouraging stability

According to Robbins (1996) this is the fourth function of organisational culture. The role of culture to create equilibrium has been addressed above. However stability is only created when a strong culture prevails (Van Aardt, 1995). A strong culture on the other hand can inhibit urgent renewal and change that may damage an organisation (Robbins, 1996).

2.3.4.5.2 Culture acts as control measure

Robbins (1996) postulates that organisational culture acts as control mechanism that guides and shapes the attitudes and behaviours of employees.
Since globalisation has affected organisational structures (flatten with less hierarchies), introduced team concepts, matrix organisations and empowered employees, the importance of creating shared meaning cannot be over emphasised (Robbins 1996). Culture acts as pointing all in the same directions. By acting as a control mechanism culture acts as protection for its members since ambiguity to what is expected in terms of behaviour is eliminated.

The second aspect of culture as postulated by Van Aardt (1995) is adapting to the external environment. The influence of the external environment that shapes culture has been discussed in the sense that culture assists to create equilibrium between influences from both the external and internal environment. Van Aardt (1995) postulates that from an occupational safety perspective, the manner in which pressures from the external environment are digested into the organisation is crucial for the management of occupational safety.

Strategic decisions in organisations are taken whilst the influence of the (defining) external environment is considered. The identity and boundary-defining roles of culture act as guide in this instance. In order to survive and progress, an organisation needs to adapt to the pressures from the external environment. Health and safety legislation in South Africa for example introduced more employee participation through representative structures that challenges the authoritarian style of management that is prevailing in the mining industry.

Although culture is a group phenomenon, the impact on individuals within the group cannot be over emphasised. Culture directs individual and group behaviour. The integration of personal and organisational values is the key to establishing a desired organisational culture. Leaders and groups (teams) are the cultural carriers.

2.3.4.6 Culture and organisational safety

In occupational safety context, Van Aardt (1995) reports a study conducted by Hansen (1993) with regards to organisational culture and occupational safety postulates that occupational safety be improved through organisational culture. A
direct relation existed between organisational culture and occupational safety. The 
improvement can be achieved through addressing values.

The problem with regards to occupational safety can be attributed to four factors:

- Inadequate and insufficient training of senior management to manage occupational safety effectively
- The complexity of the causes of incidents and injuries are overlooked because management is interested in quick fixes
- Traditional safety management programmes are implemented in the absence of proven success and within the relative standards that are achieved
- Organisations continue to implement what managing directors directed years earlier regardless of the fact that situations have changed.

This reveals an inability to adapt to change.

According to Van Aardt (1995) the organisational culture change process must ensure the following:

- Participation of all in the organisation
- Leadership must encourage new ideas, creative solutions and stimulate thinking, exercise strong leadership and ensure accountability to effect change.
- Integration of occupational safety values with the value system of the organisation
- Attitudes towards occupational safety need investigation since negative attitudes will influence organisational culture.

### 2.3.4.7 Integrating organisational culture and occupational safety

In a study conducted in the mining industry, Van Aardt (1995) postulates the following:

- The top leaders of organisations have a major role to play to establish an occupational safety culture.
- Interactive socialising is inadequately developed due to supervisors being predominantly white and workers black. White supervisors were not prepared to develop black subordinates.
• This has major implications for establishing a culture based on development and trust.
• Senior management (predominantly white) are more positive inclined than lower employees (predominantly black). Two aspects need to be introduced. The first is worker participation practices and members who can translate the values to ensure integration.
• The role of teams to enforce collectivism versus individualism. Group values, when internalised by individuals, are powerful drivers of behaviour.
• Van Aardt (1995) established a correlation between the commitment of the organisation towards occupational safety and the integration in teams. The stronger the attitude established to the organisation, the greater is the commitment to occupational safety, and the more positive will the attitudes be towards integration in the team concept.
• Motivation is a leader concept and responsibility. The level of motivation towards occupational safety is the result of underlying factors that encourage or discourage safe behaviour.
• The way values are communicated and shared determines the manifestation of values on the visible or invisible level. Interactive socialising is the key.
• Management philosophy (autocratic) needs to change to democratic and structures (silos, hierarchical) need to adapt to network and team–based organisations.

In a study conducted in the aviation industry with regards to safety culture and climate, Wiegman, Zhang, Van Thaden, Sharma and Mitchell (2002) define safety culture as an enduring characteristic of an organisation that is reflected in its consistent way of dealing with critical safety issues. Five global indicators of a safety culture is identified by Wiegman et al (2002) namely:

• Organisational commitment of the upper management levels for safety through systems, training and practices
• Management involvement through participation of and communication with employees
• Employee empowerment through delegation of authority or responsibility for safety
• Reward systems which include positive and negative rewards and
• Reporting systems that support a reporting culture.

Culture is a descriptive term and drives behaviour. Behaviour is influenced by basic assumptions, unquestioned and unconscious beliefs. Culture is learned through a process of interactive socialising between people and within groups. Culture also protects the people and guides behaviour that is associated with the group.

As organisations are not static but change through influences from the environment, culture adapts and changes. Very strong cultures however change with difficulty. Leaders from the top of the organisation to the lowest level of employees are carriers of culture.

Where an organisation experiences occupational safety problems, the culture of the organisation has not been developed to the extent required by the organisation. Since culture is a group phenomenon, the teams in the organisation need to be led from a leadership point of view to enact the desired culture. However the systems and processes need to adapt to support the desired culture since the envisaged changes will be null and void when contradictions with practices and processes occur.

The Safe Human Mindset measuring instrument measures culture in two aspects namely values and beliefs. Both values and beliefs have been discussed from a theoretical perspective. Values, in addition are internalised attitudes about what is right or wrong, ethical and unethical, moral and immoral. Values also reflect fairness, justice, honesty, freedom, equality, loyalty, excellence and courtesy. The importance of values is emphasized since values find expression in leaders’ preferences, aspirations, perceptions situations and problems as well as the leaders’ choice of behaviour in a particular situation (Yukl (1994).

Schutte (1998) measures the following concepts associated with values:
• Self - care in safety refers to the realisation of personal responsibility to take care of own safety.
• Brothers' keeper mentality refers to the realisation of team responsibility to take care of co-workers' safety and foster an interdependent culture. Schutte (1998) refers to brothers' keeper's mentality as reflecting an interdependent culture where team commitment, positive pressure, a sense of high safety responsibility and caring for the safety of others are dominant features. An internal locus of control and high levels of self-persuasiveness characterises the culture of interdependence.

• Responsibility of the safety department refers to perceived responsibility of the Safety Department for safety.

• Opportunity refers to perceived opportunities and latitude to contribute to safer work.

• Safety supervision champion refers to the perceived value that the supervisor adds to safety.

• Treatment for at-risk behaviour refers to the perception that poor safety performance in the workplace is unfairly punished.

• Zero Defect focus refers to the degree that work / groups or teams want to achieve zero injuries.

• Health and well-being experience refers to the degree that employees experience health and well-being.

• Perceived commitment towards safety refers to the degree that employees are fully committed towards safety.

Schutte (1998) refers to beliefs as unquestioned rules that are almost unstated or unconscious that is core to the culture of an organisation. It entails assumptions taken for granted about the 'way things are done around here'. Beliefs provide the context and the reality in which behaviour occurs.

Schutte (1998) associates the following aspects with regard to beliefs:

• Incidents will always happen
• Safety department will resolve all matters
• Powerlessness regarding risks refers to the belief that nobody can do anything about risks at work
• Safety program is to cut costs refers to the belief that the objective of the safety program is to cut costs.
• Safety record is good refers to the belief that the safety record of the organisation is good.
• Full responsibility for actions refers to employees take full responsibility for their actions.
• Interest in welfare refers to the belief that the management has a real interest in the welfare and happiness of all employees.
• Good safety practices refer to the belief that the organisation exercises good safety practices.
• Knowledge encourage safety refers to the belief that knowledge about the work encourages employees to act safely.

The Safe Human Mindset™ Model and measuring instrument reflect the prevailing mindset of the respondents at a given point in time when the measuring instrument (survey) is applied.

This study is aimed at the Shiftbosses and Miners in an organisation who will be subjected to the survey measuring instrument. Both the two management levels have direct responsibility in terms of the Mine Health and Safety Act and Regulations Act 29 of 1996 (the Act). Occupational Safety in South African Mines is directly addressed in the Act.

2.3.4.8 Occupational Health and Safety

2.3.4.8.1 Introduction

The South African Mining Industry has experienced a number of disasters (although the death of one person is a disaster) in the history of Mining since the turn of the twentieth century.

The Coalbrook disaster in 1960 accounted for 435 fatalities, Hlobane Coal Mine in 1983 where 68 deaths occurred, Kinross Gold Mine in 1986 where 177 deaths resulted, St. Helena Gold Mine in 1987 where more than 60 people were killed and
Vaal Reefs Gold Mine in 1995 where 104 people lost their lives. The astronomical loss in revenue and the loss to families cannot be quantified in monetary value.

The International Labour Organisation in 1944 accepted resolutions to ensure occupational safety in the work environment (Van Aardt, 1995). The principle of tripartism where the state, employer and employee collectively accept responsibility culminated in NEDLAC in South Africa. The main features of the Act have been discussed suffice to mention the aim is a safe working environment and structures to promote participation.

Schutte (1998) distinguishes three characteristics of a visionary organisation namely inclusiveness, (involvement/ empowerment), principled leadership (inside out) and commitment within three pillars of organisations. These pillars are people, process and technology. Schutte (1998) postulates a balancing act between the three pillars where the workforce feels valued, involved and therefore committed to zero harm.

The human element is central to achieving organisational success. It is only since the middle 1980's that research globally commenced to concentrate on the human element.

Van Aardt (1995) postulates three elements for successful organisational functioning namely objectives that must be achieved by employees through application of techniques in an organisation. The absence of one of the above will not lead to success.

### 2.3.4.8.2 Defining Occupational Health and Safety

Van Aardt (1995) postulates that Occupational Safety finds its origin in the adaptation of human behaviour and is the design of the physical work environment to reduce possible risks to such an extent that occupational injuries are prevented. Van Aardt (1995) distinguishes two aspects associated with occupational safety namely risk and acceptable judgment (risk assessment). Risk is associated with the probability and possible consequences of all risks. Acceptable risk judgment from the employer perspective concentrates on possible consequences of an incident as well as cost implications to eliminate risk.
2.3.4.8.3 Concepts associated with Occupational Health and Safety

Besides risk and acceptable judgment (risk assessment) Van Aardt (1995) identifies seven concepts that are closely related to Occupational Safety.

- Occupational injury refers to an unexpected, unplanned event that interrupts the normal process of activities. In addition the result is damage to property and injury or death to people.
- Occupational incident differs from occupational injury in that in an occupational incident, no harm or loss of any kind has been incurred.
- Unsafe human acts or behaviour is described as the behaviour of employees who violate established and accepted behaviour rules, which may result in either occupational incident or injury.
- Unsafe physical work environment or circumstances refer to the direct environment to which an employee is exposed as well as machinery that is utilised which may result in occupational injury.
- Occupational disability refers to the state of an employee after the occurrence of an occupational injury that prevents the employee from performing normal duties. Occupational disablement consist of various categories namely fatalities, permanent total disability, and temporary total disability. In addition the Act also prescribes the reporting of serious injuries that will prevent an employee from returning to normal (duties within 14 (fourteen) working days). The Inspectorate from the Department of Minerals and Energy investigate all serious injuries through formal inquiries. The reporting of all lost time injuries is also mandatory in terms of the Act. A lost time injury is classified as any injury that prevents an employee to resume normal duties with the commencement of the next shift (Chapter 5, Section 60 of the Act).
- Occupational injury frequency is the term applied to standardise the disablement injuries per million man-hours worked.

  The formula applied is:

<table>
<thead>
<tr>
<th>Total disablement injuries</th>
<th>x 1 000 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of hours worked</td>
<td>1</td>
</tr>
</tbody>
</table>

The rate obtained can then be used for purposes of benchmarking and standardisation.
The fatalities, permanent total disabilities and temporary total disabilities, serious and lost time injuries may also be expressed in terms of a rate per million man-hours worked through applying the above mentioned formula in every case.

- Compensation.

Besides the Rand Mutual Insurance Fund which provides cover for participating mines in South Africa in terms of the various categories of injuries mentioned above, the Compensation for Occupational Injuries and Diseases Act 130/1993 provides compensation for disablement caused by occupational injuries or diseases sustained or contracted by employees in the course of their employment, or for death resulting from such injuries or diseases and to provide for mothers connected therewith.

An overview of occupational injuries is incomplete however if cognisance is not taken of the various theories that attempt to explain the causes of occupational injuries.

**2.3.4.8.4 Causes of occupational injuries**

Research since the 1960's identified eight theories that attempt to provide more insight into the causes of occupational injuries. According to Van Aardt (1995) these are accident proneness theory, death wish theory, group factor theory, social conditioning theory, industrial climate theory, domino theory and theory of loss control.

- Accident proneness theory according to Van Aardt (1995) originated in the 1930's when it was established that certain individuals tended to be more involved in incidents than others. This however was rejected with research in the 1960's who revealed all people were susceptible to injuries.

- Death wish theory originates from psychoanalysis of Sigmund Freud who identified the Eros (life instinct) and Thanatos (death instinct) as two opposing forces in every person. Eventually Thanatos is the victor and according to this theory people became involved in incidents and injuries to destroy life.

- Group factor theory argues that group forming and group interaction as well as the inherent composition thereof may result in injuries occurring more in some groups than others.
Considering organisational culture and the role it plays in occupational injuries, Van Aardt (1995) postulates that certain groups in the organisation integrate safety values to a more or lesser extent than other groups in the organisation. The integration of culture into a group is determined by the perceived importance of safety values. This theory supports the interdependent culture postulated by Sutherland et al (2000) and the brothers’ keeper mentality stated by Schutte (1998).

- Social conditioning theory argues that norms are inherent within groups and when these norms are adhered to, occupational injuries will not occur. When the threshold of norms is lowered however, and this is sanctioned within the organisation, normlessness will result with the resultant injuries. Organisational culture plays an important role in maintaining norms and values. The integration of safety values into pre-awareness (mentifacts) acts as safeguard that normlessness will result (Van Aardt, 1995).

- Industrial climate theory focuses on the physical work circumstances that act as cause(s) to occupational injuries. Equipment, machinery, physical work environment underground (tunnels and roofs or hanging wall, the stope face, lighting and temperatures) all are factors associated with the physical work environment. Organisational culture plays an important role in the sense that when safety values are highly regarded, the physical work environment will be engineered to such an extent that occupational injuries and risk pose no danger.

- The theory of loss control presupposes ratios of occupational injuries. The ratios are principled as 600-30-10-1. For every 600 incidents without any visible damage, 30 incidents occur with damage (to property) and of the 30 incidents 10 would result in minor injuries and for every 10 that result in minor injury 1 would result in serious injury. Van Aardt (1995) however reports that no scientific evidence support these ratios.

- The domino theory stated by Van Aardt (1995) is probably the best known to determine causes of occupational incidents. The basic argument is that occupational incidents occur as a result of a sequence of events.
All occupational incidents are classified into three phases namely the pre-incident, incident and post-incident phase (Van Aardt, 1995). The pre-incident phase occurs in three steps namely:

**Step one** is characterised by a lack of management practices that result in inadequate application of work standards. With regards to inadequate management practices, Van Aardt (1995) distinguishes the lack of a proper, functioning safety programme, lack of standards or knowledge thereof and an omission to comply with or apply prescribed standards.

**Step two** of the pre-incident phase refers to the basic causes of the incident or injury and is divided into human and work factors.

**Step three** of the pre-incident phase namely immediate causes relate to sub-standard practices and errors that are made. During the incident phase, emphasis is placed on the incident as such which may result in injury or loss. The two aspects related are unsafe acts and unsafe conditions.

Schutte (1995) postulates that global research indicate that 85% eighty five percent and higher of all incidents and injuries are connected to the human factor. The post-incident phase results in loss. Loss can be either to human(s) or property or both.

The loss to human(s) can be either fatal(s) or injury, which may result in permanent disablement. The psychological trauma, pain and suffering are difficult to quantify. Loss to property may be damage to machinery or equipment or loss to production. The effect of fatality is loss of morale.

Van Aardt (1995) postulates that the theory of multiplication is inherent to the domino theory. The first step is to prevent the first domino to fall (management practices and minimisation of unacceptable work standards). When occupational safety is elevated to the mission statement of the organisation and contained in the various management systems and practices, a culture of safe performance will be engrained in the values and resultant behaviour of employees (Van Aardt, 1995). The human factor (behaviour) thus runs like a golden thread through the multiplication and domino theories.
In the absence of relevant theory of human error contributing to occupational injuries, Van Aardt (1995) focuses on the deviation from existing norms and distinguishes four norms relevant to occupational safety. These are:

- Standard rules and regulations that regulate occupational safety in an organisation.
- Adequate and acceptable behaviour from individuals.
- The extent to which behaviour can be classified as normal and
- The prevalence of planned or unplanned actions.

Diversions from these norms contribute to occupational injuries according to Van Aardt (1995).

The Safe Human Mindset Measuring Instrument discussed in Chapter 3 measures the various constructs of the Safe Human Mindset Model that was discussed in this chapter, from a theoretical perspective.

Credible relationships and a climate and culture conducive to safe performance fundamentally shape and influence the mindset of employees. A safe mindset results in safe behaviour but this is only as far as individuals are concerned. Where employees operate in teams, interdependence for safety needs to be created and fostered. This is a leadership imperative.

2.4 Conclusion

The transformation of the target organisation to world – class status is achieved in the first instance through directive leadership. The role of leadership in organisational safety context through establishing credible relationships, create a climate conducive to safe behaviour and instil a values and belief system that would motivate a safe mindset of employees have also been discussed.

Employee participation in health and safety matters through learning, communication and empowerment to accept accountability impacted on the safe mindset of employees and were to be achieved if the organisation were to transform to world – class status.
Values that were embedded in the belief system of employees found expression in their behaviour. Values in organisational safety context influenced behaviour and leaders were responsible to establish and display the values that were to be lived by all employees.

A culture of safe performance also contributed to improved business results. This chapter created the theoretical context of the safe human mindset and forms the foundation of the research to be conducted in Chapter 3. Having created a reasonable understanding of the concepts of the world – class organisation and the concepts that moulded a safe human mindset, the research to establish the safe mindset of the three production leader levels in the target organisation is introduced in the chapter that follows. The results of the research will assist to ultimately transform the organisation to world – class status.
Chapter 3

Empirical Research Methodology

I have six stalwart men,
They taught me all I know,
Their names are What? and Where?
and When? And Why? and How?
and Who?
- Rudyard Kipling
CHAPTER 3: EMPIRICAL RESEARCH METHODOLOGY

3.1. Introduction

Chapter 2 created a common frame of reference regarding the theory of the world-class organisation as well as the theoretical foundation of the Safe Human Mindset Model, on which this study is based.

This chapter addresses the research design, participants, the SHMI to be applied in collecting data for purposes of testing the integrative hypothesis stated in Chapter 1, the research process as well as the statistical procedures employed in sorting and interpreting the data gathered subsequent to the application of the measurement instrument.

Against this background, the empirical study is aimed 1) at identifying the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners in the target organisation, and 2) through the application of statistical procedures, to determine significant statistical differences in the safe mindset of the three leader levels.

The results of the methodology yield a particular profile of the collective safe mindset of the three leader groups as well as the three leader groups individually.

The empirical research endeavours to achieve the objectives of the study by testing the integrative hypothesis below as defined in Chapter 1.

Hypothesis H01 (integrative hypothesis)

There is no statistically significant difference between the safe mindset (safety motivational intent) of the Managers, Shiftbosses and Miners in the target organisation.

In the section that follows, the research design and supporting rationale is discussed.

3.2 Research design

The research design expresses the type of study undertaken with the aim of
providing meaningful and acceptable answers to the research problem (Struwig et al (2004). According to Coetzee (2006), the research design has three purposes:

- It provides answers to research questions.
- It controls variance.
- It enables the researcher to answer research questions as validly, objectively, accurately and economically as possible through reliable observations and inferences made during the empirical study through meticulous planning and execution.

The research question(s) therefore dictate the research design.

This study applies a quantitative descriptive approach and through the gathering of data and application of statistical methods (inferential (both parametric and non parametric) as well as Multiple Comparisons Post Hoc tests) the stated hypothesis is tested. Quantitative research is based on positivism, takes scientific explanation to be nomothetic (based on universal laws) and aims to measure the social world objectively through the testing of hypotheses (Petkoon, 2002).

Petkoon, (2002) states that three aspects are identified with any research namely ontology, epistemology and methodology:

Ontology refers to the nature and reality of human behaviour.
Epistemology refers to the relationship of researchers to reality and the path that would be followed in the search for the truth.
Methodology refers to the process, scientific methods and techniques applied to obtain knowledge that is valid.

3.2.1 Ontology

With regards to ontology the researcher that applies a quantitative research approach has a belief in an objective reality that can be explained, controlled and predicted through laws of cause and effect (natural laws)(De Vos et al, 2000). Human behaviour can be explained in causal deterministic ways and participants can be manipulated and controlled (De Vos et al 2000). Quantitative research takes universal propositions and generalisations as a departure point and applies deductive reasoning (Petkoon, 2002).
The ontology of this study refers to the Safe Mindset (motivational intent) of production leaders resulting in safe behaviour that can be explained (and predicted) through the application of the SHMI, which is completed in a controlled environment. An output of the measuring instrument is the identification of factors that explain the current safe mindset of participants.

### 3.2.2 Epistemology

With regards to epistemology the researcher that applies a quantitative approach is objective (not part of) and detached from the object that is studied (Struwig et al, 2004). The SHMI is applied to the identified target populations in a classroom condition free from disturbances. The Managers complete the SHMI electronically within the confines of their own offices. The Shiftbosses and Miners complete the SHMI individually in a classroom setting. Since all participants are literate in English, little intervention from the researcher was required in completing the SHMI.

### 3.2.3 Methodology

In terms of methodology in quantitative research, the researcher poses questions or hypotheses that are subjected to empirical testing for verification (De Vos et al, 2000).

The research methodology is discussed in detail below:

According to Struwig et al, (2004) quantitative research examines constructs that are based on the hypothesis derived from a theoretical scheme. Constructs are the variables that are the central focus of the research. The constructs that are studied must be measured through either questionnaires and or some form of observation. In addition, quantitative research requires from the researcher to specify precisely how the constructs will be measured (Struwig et al, 2004).

### 3.2.4 The use of data

Primary data was used in this study. According to Struwig et al (2004), primary data is personally collected by the researcher and is gathered for a specific purpose.

### 3.2.5 Research design choice
The research design was constructed to reflect the following characteristics:

- It falls within the quantitative research paradigm and
- It is based on primary data.

This study is based on the quantitative research approach. The motivation for adopting a quantitative approach lies in the objectivity of the SHMI specifically where the three production leader levels are compared with regards to their respective safe mindsets. The statistical analysis associated with quantitative research facilitates testing of hypotheses objectively (Struwig et al, 2004).

The theoretical foundation of the various constructs and sub-constructs of The Safe Human Model were discussed in Chapter 2.2.

**Quantitative research**

Quantitative research is a cycle of sequence of phases namely formulating hypotheses, collecting data, analysis and interpretation with the aim to determine and qualify the relationship between an independent variable and a dependent variable in a population (Coetzee, 2006).

Survey research usually studies samples drawn from populations in a specific manner that would formulate research with the aim of obtaining information that would determine interrelationships amongst sociological and psychological variables (Coetzee, 2006). Survey research normally focuses on people, their beliefs, opinions, behaviours and motivations (Coetzee, 2006).

In this study the application of the SHMI to the Mangers, Shiftbosses and Miners (identified three production leader levels) will be the method of collecting data (information).

3.3. **The Safe Human Mindset Model on which the SHMI is based**

The Safe Human Mindset Model consists of the following constructs and sub-constructs:

- **Relationship credibility**
  - Trust
- Caring support
- Respect
- Ownership

**Worklife experience**

**Workforce satisfaction**
- Attitude towards the job
- Attitude towards the organisation

**Work environment**
- Physical environment
- Safety intent

**Culture**
- Values
- Common beliefs

These constructs collectively shape the safe human mindset (safety motivational intent).

The Safe Human Measurement Instrument measures the various constructs of the Safe Human Mindset Model (figure 2-27 discussed in Chapter 2.2).

### 3.4 The Measuring Instrument

The Safe Human Mindset Measurement Instrument is a statistically validated 60 item statement (questionnaire) that is based on a quantitative research approach. The instrument was developed by Prof. Petri Schutte and the University of the North-West’s Statistical Department (Prof. Faans Steyn) is the custodian of the data in the previous application of the instrument.

**Reliability**

The overall reliability (in the previous application of the SHMI depicted in Table 4-19) Cronbach Coefficient Alpha is .78 which is >.7 and subsequently indicates reliability.

The SHMI consists of three parts.
- Part A describes the method of completion and anonymity.
Clear and direct written instructions to complete the questionnaire as well as exercising choices on the respective statements accompany the questionnaire. In addition the facilitator verbally explains the completion and exercising of choices as well as clearing all possible misunderstandings during the completion process in order to eliminate bias.

- Part B consists of the biographical information requiring from respondents to indicate with an 'x' their choice regarding:
  - Organisational level
  - Job title
  - Job level
  - Tenure
  - Age
  - Gender and
  - Home language

The latter two, namely gender and home language, are not considered for purposes of this study.

- Biographical variables
  Two independent variables within the organisation are identified as part of the research methodology to be included in this study.

- Age
  Robbins et al (2003) argue that in the South African work context age is of importance for three reasons.

  The first is the belief (true or false) that job performance declines with increased age. The second is the reality of an ageing workforce and the impact of HIV and AIDS and thirdly the practical mandatory prohibition of retirement ages in the Labour Relations Act 66 of 1995.

  The age variable indicates age in the target organisation in the following four categories:
  1 – age 20-30
  2 – age 31-40
  3 – age 41-50 and
  4 – age 51 – 60
Coetzee (2006) states that organisational change impacts on the satisfaction levels of employees. Organisational change is a possible outcome of the study hence the inclusion of age as an independent variable.

- Tenure
  Robbins et al (2003) identify tenure with length of work experience and report a positive relationship between tenure and productivity. Coetzee (2006) relates that a study conducted by Frances (2003) found that longer serving employees within the ranks of supervisors and middle management level were notably less inclined to commit (buy in) to a specific change concept.
  The tenure variable indicates tenure in the target organisation in the six following categories:
  1 – 1 year
  2 – 2 years
  3 – 3 years
  4 – 4 years
  5 – 5 years
  6 – 6 years
  The rationale for choosing six categories for tenure was that the target organisation was in existence (production) for six years at the time of the study. Cognisance however needs to be taken of the dichotomy of age and tenure described above.

- Part C entails The Safe Human Mindset Survey (Safe Human Measurement Instrument - SHMI) that consists of 60 items (statements) that measure the constructs and sub-constructs of the Safe Human Mindset Model.

  The 60 (sixty) items (statements) are cross-correlated to verify perceptions regarding the same item in different constructs. Eighty two percent (82%) of all items based at a specific construct are cross-correlated with items in alternative constructs to optimize reliability and trueness of responses.

  The measuring instrument contains statements that are stated either negatively or positively. The statistical processing of data considers these in processing the data.
The 60 item statements (SHMI) measure the constructs and sub-construct as follows:

- **Relationship credibility** is measured with 16 (sixteen) items that prompt statements about the respondents' perception of the trueness (caring character) of the work relationship. The sub – constructs include trust, caring support, respect and ownership.
  
  Typical statements relating to this dimension (construct) are:
  - The work relationship in our team is characterised by mutual respect
  - I always feel that I’m treated fairly

- **Climate** consists of workforce satisfaction measured with 10 (ten) items evaluating job and company satisfaction as perceived by employees; work environment consists of physical environment and safety intent, which is measured with 15 (fifteen) items (statements).
  
  Typical statements relating to this dimension (construct) are:
  - My work gives me a sense of accomplishment
  - The organisation is not making the changes necessary to compete effectively

- **Perceived Values** measures espoused values as perceived by respondents that are indicative of what respondents’ behaviours are designed to accomplish and seek to elicit. They are measured with 10 items.
  
  Typical statements relating to this dimension (construct) are:
  - I do not feel valued as a human being at the workplace
  - In our workplace we exercise a brothers’ keeper mentality

- **Common beliefs** measure the context and reality in which behaviour occurs (unquestioned rules or unconscious beliefs in the way things are done) as perceived by respondents and is measured with 9 items.
  
  Typical statements relating to this dimension (construct) are:
  - I believe that incidents will always happen
• I can do nothing about the risks in my section

Response scale
All items (statements) are scored on a 4-point Likert type scale, which elicit responses from ‘strongly disagree to strongly agree’. A numerical value from one to four (1-4) is assigned to the four-point scale for data processing purposes.

The four point Likert type scale differs from the classical 5 (five) or 7 (seven) points scale to eliminate unsure or neutral responses.

<table>
<thead>
<tr>
<th>Response Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>Disagree</td>
</tr>
<tr>
<td>Agree</td>
</tr>
<tr>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

3.5 Sample
The total participation of the target populations in the three leader groups in the study differ from the classical random sampling method. All the incumbents in the Managerial, Shiftboss and Miner categories participated because they were relatively low in number. The total participants were: (N=1060, Managers (N1=18), Shiftbosses (N2=28) and Miners (N3=60).

3.6 Research process
With the aim of achieving the objectives of the study, the following process depicted below will be followed:

**Step 1:** A motivation for the study will be submitted and approved by the relevant Managers.

**Step 2:** All participants will be briefly and invited in writing to participate in the study.

**Step 3:** A schedule of sessions with all participants to complete the SHMI will be prepared.
**Step 4:** All participants are to complete the SHMI and the data gathered will be captured on a spreadsheet using Windows Excel.

**Step 5:** Statistical analyses will be completed by STATCON at UJ applying the SPSS for Windows statistical package.

**Step 6:** The statistical analysis will be interpreted to determine the safe mindset of Managers, Shiftbosses and Miners.

**Step 7:** The obtained results will be discussed with the objective of testing hypothesis.

**Step 8:** Based on the findings of the study, recommendations will be made in conclusion to address identified areas for development and recommendations made for possible future research.

### 3.7 Statistical analyses applied in the study

A two-phased approach to statistical analysis will be followed.

- **Phase one** entailed data capturing, processing and the application of descriptive statistics.
- **Phase two** entails the application of inferential statistical analysis (parametric, non-parametric) and Multiple Comparison Post Hoc tests for purposes of testing hypotheses.

#### Phase one

The total responses (N=106) of the completed survey (SHMI) received are captured on a Windows XP Professional-Excel spreadsheet. The spreadsheet is supplied to STATCON at UJ for purposes of analysis applying the SPSS statistical package.

All raw data is treated with confidentiality and only results are published. No other person, organisation or group has access to collected data.

The statistical analysis and methods applied by STATCON at UJ are discussed in the phases mentioned below.

A univariate approach to data processing, analysis and interpretation will be applied. The emphasis is on descriptive statistics. In this phase the data analysis for purposes of providing proof of reliability and validity of the SHMI is provided. The
descriptive statistics applied are counts, percentages, means, standard deviation, skewness and kurtosis.

**Item descriptive statistics**
The normality of the item distribution will be established utilising item descriptive statistics. When normality in a distribution is obtained, parametric tests facilitate statistical analysis (Field, 2005). The application of parametric, non-parametric and multiple comparison post hoc tests are discussed in Phase Two.

**Frequency distribution: The FREQ procedure**
The FREQ procedure will be applied to the total number of respondent Managers (N1=18), Shiftbosses (N2=28) and Miners (N3=60), total (N=106). The total number of responses per statement (60), are calculated in terms of the possibilities on the Likert-type scale (1-4) and the numerical values assigned to each 1=1, 2=2, 3=3 and 4=4.

The FREQ procedure reflects the total respondents per statement (60) for each possibility (1-4) on the Likert-type scale as a frequency and a percentage respectively.
A cumulative frequency is subsequently calculated by progressively calculating the total responses and the total possibilities of the scale.

**The mean**
Struwig et al (2004) declare that descriptive statistics provide statistical summaries of data. The purpose is to provide a picture from a large number of data.

Two processes in descriptive statistics are provided by Struwig et al (2004) to present data in a meaningful manner. The first is measure of central tendency and the second is dispersion (variability). Central tendency is measured in this study through the median and the mean.

De Vos et al (2000) maintain that the mean is calculated by dividing the sum of the measurements by the number of measurements. Struwig et al (2004) refer to this as the average score, which is also the balance point (centre of gravity) of the distribution of data. According to De Vos et al (2000), it is worth noting how far above
or below the mean an observation is. Dispersion indicates the degree to which the scores are spread out and include the range, standard deviation and variance (Struwig et al, 2004).

De Vos et al (2000) state the mean is the most stable and versatile of all measures of central tendency. The mean for the different groups in this study will be calculated individually and in total for the three leader levels.

**The standard deviations**
Dispersion measures according to Struwig et al (2004) indicate the degree to which the scores are spread. The standard deviation according to Struwig et al (2004) measures the deviation of each score from the mean and then averages the deviations. In addition skewness and kurtosis will be determined for purposes of establishing normality of the item distribution.

**Reliability and Validity**
The objective of reliability and validity is to report that the instrument applied in the study has both reliable and valid scores and that the design of the study is reliable (Struwig et al, 2004).

- **Reliability**
Struwig et al (2004) postulate that Cronbach's coefficient alpha is the appropriate measurement for reliability when individuals respond to items on multiple levels and are particularly useful for measures that have Likert-type scales where responses vary from 'strongly agree to strongly disagree'.

According to Simon (2004) the Cronbach Coefficient Alpha measures how well each individual item in a scale correlates with the sum of the remaining items and is a measure of consistency among individual items in a scale.

Reynaldo and Santos (1999) state that Cronbach Alpha is a numerical co-efficient of reliability and is based on the reliability of a test relative to other tests with the same number. They also describe Cronbach Alpha as an index of reliability not associated with the variation accounted for by the true score of the underlying construct and construct being the hypothetical variable that is being measured, where the alpha
coefficient ranges in value from 0 to 1 thus the higher the score the more reliable is
the generated scale. Field (2005) states a Cronbach coefficient alpha value of >.7 is
generally accepted in social science as indicative of reliability.

To compute the coefficient, the variance of all the data and the individual items are
used.
The high internal consistency implies a high degree of generalization across the
items within the test. Schutte (1998) argues that reliability is an integral part of
validity and a test could never be valid if it were not reliable.

• **Validity**
Struwig et al (2004) refer to construct validity as the degree to which a test measures
the theoretical construct or abstract variable that it intended to measure and assert
that one cannot view the various types of validity as completely separate from one
another, but as being unified. Construct validity includes content as well as criterion
related evidence and is based on the ‘integration of evidence that bears on the
interpretation or meaning of the test scores’ (Struwig et al, 2004). Furthermore, they
propose a process of construct validation that commences with defining the
construct, then hypothesising its relationship to other variables. Only then is an
instrument reflecting the construct developed and finally, if the test's score is found to
be reliable, only then is its relationship to other tests or variables determined
(Struwig et al, 2004). Thus validity can be interpreted as the extent to which a
research design is scientifically sound or appropriately conducted.

De Vos et al (2000) state that construct validity is concerned with the meaning of the
instrument, what it is measuring and how and why it operates the way it does. Not
only is validation involved but also the underlying theory. Schutte (1998) professes
that construct validity is the extent to which a test measures a hypothetical construct
and is usually established by relating the results of the test to some form of
behaviour.

• **Factor analysis**
Factor analysis is a specialized statistical technique and is applied to establish construct validity (Coetzee, 2006). Struwig et al (2004) refer to constructs as an abstract variable that is not directly observed. Factor analysis consists of multivariate statistical methods whose main purpose is defining the underlying structure in a data matrix (Petkoon, 2002).

The rationale for applying factor analysis according to Field (2005) includes:

- The understanding of the structure of a cluster of variables
- Reducing the data set to a more manageable size while retaining as much as possible of the original information. (This process facilitates the determination of the number of dimensions required to represent a set of variables according to Petkoon, 2002).
- To identify the underlying constructs or factors that explain the correlation among a set of variables and
- The construction of a questionnaire to measure an underlying variable.

Communality is associated with variance in factor analysis. Data that is gathered through measurement will reflect variance and by applying factor analysis the amount of variance present in the data is established.

The previous application of the SHMI (N=11929) retained twelve factors subsequent to factor analysis. These retained factors could explain 75.2% of the variance in data with a minimum communality of .55 and a maximum communality of .85 with an average communality of .74.

Field (2005) postulates that it is fundamental to establish how much of the variance present in gathered data is common variance and states that in factor analysis, once the underlying factors have been extracted, it is possible to calculate the communalities between each variable and factors extracted.

Communality reflects (measures) the proportion of common variance explained by the extracted factors. Field (2005) describes communality as the proportion of common variance in a variable. A variable that has no specific variance will have a
communality commonality of 1 whereas a variable that shares none of its variance with any other variable would have a communality commonality of 0. Thus a factor of > 0.5 would reflect high communality in all constructs measured taken the sample size into consideration.

A construct, according to Struwig et al, (2001) refers to an abstract variable that is not directly observed.

3.7.1 Approach to be followed
As previously stated, the custodian of the statistical processes and original data of the SHMI is the Department of Statistics at the University of North - West (Potchefstroom campus) and principal factor analysis (principal axis factoring) is the preferred form of factor analysis applied. The least number of factors, which can account for the common variance or correlation of a set of variables, is determined (Petkoon, 2002).

3.7.2 Factor analytic data mode
The R- mode factor analysis is applied and reflected in a matrix. Field (2005) describes the R- matrix as correlation coefficients between pairs of variables. According to Field (2005), this assists in explaining the maximum amount of common variance in a correlation matrix using the least number of explanatory concepts. Petkoon (2002) states that in an R- matrix, rows are cases, columns are variables and cell entries reflect scores of the cases of the variables.

3.7.3 Criteria to determine number of factors
The Kaiser criterion is used to determine the number of factors. The Kaiser rule is to select all factors with an eigenvalue >1 (Field, 2005).

- Rotation method
According to Field (2005), rotation serves to simplify interpretation of factors through discriminating between factors. When factors are not rotated, interpretation is difficult since variables tend to load on multiple factors (Petkoon, 2002). Rotation of the axes result in variables loaded maximally to only one factor and is expressed as
Field (2005) postulates the rule of communality as >.5 taken the sample size into consideration is an indication of high communality.

According to Steyn, (2007), a Varimax rotation is applied for first order factor analyses.
A Varimax rotation is an orthogonal rotation of the factor axes through rotating the factors and keeping them independent (Field, 2005).

The variance of the squared loadings of a factor (column) on all the variables (rows) in a factor matrix is thereby maximised and the number of variables, which have high loadings on one given factor is minimised (Petkoon, 2002). Since each factor will tend to have either large or small loadings of particular variables, a Varimax solution yields results that make it easy as possible to identify each variable with a single factor (Petkoon, 2002).

- **Number of cases to do factor analysis**
  Petkoon (2002) states that no clear indication existed as to the number of cases needed to do factor analysis. Four general 'rules of thumb' are provided as to the subject – to - variables ratio (STV).
  - STV ratio should not be lower than 5
  - Rule of 100 which states the number of subjects should be larger than 5 times the number of variables, or 100 and when communalities are low and/or few variables load on each factor, even more subjects are required
  - Rule of 150 when there are a few highly correlated variables when highly co-linear variables are collapsed and
  - Rule 200 states that there should be at least 200 cases irrespective of STV.

The number of cases in the previously application of the SHMI is N = 11929. A total of 12 factors could be retained that yielded eigenvalues > 1 with a communality of between .55 and .85 and an average communality of .74 which is >.5. The SHMI is thus a reliable and valid measuring instrument to determine the safe mindset of the target populations.
**Phase Two**

The results of the measurement of constructs and sub-constructs through the application of the SHMI will be subjected to statistical analysis applying inferential statistical procedures, non-parametric tests as well as Multiple Comparisons Post Hoc tests.

The inferential statistical methods applied are:

- **One-Way ANOVA** is a univariate analysis of variance for calculation of one-way fixed factor analysis (parametric test). ANOVA is performed to determine the significance in difference between means (Petkoon, 2002). The differences are separated into variances that are a result of differences between individuals within groups and variance as a result of differences between groups (Petkoon, 2002).

- **Levene's Test of Equality of Error Variances** (a) to determine homogeneity or heterogeneity of variance.

- **ANOVA F-ratio Test of Between Subjects Effects** when homogeneity of variance occurred.

- **Brown-Forsythe Robust Test of Equality of Means** when heterogeneity of variance occurred (violation of one assumption of ANOVA).

- **Kruskal-Wallis Test Ranks and Test statistics** (a, b) (Non-parametric test equivalent of ANOVA) to determine variance amongst the three leader groups.

- **Multiple Comparisons Post Hoc tests** including both Dunnett T3 and Scheffé (depending on heterogeneity or homogeneity of variance) to determine statistical variances amongst the three leader (group) levels.

Coetzee (2006) postulates that for the application of research results to have the greatest impact and value for decision support purposes, statistical significance should not only be considered for research outcomes, but also 'meaningfulness' and or practical importance of the outcomes.

### 3.8 Conclusion

The theoretical discussions of the constructs that are measured by the SHMI were discussed in chapter 2.3 and the empirical research methodology on which the study is based was discussed in this chapter 3.
This chapter documented the empirical research design, the SHMI, the research process as well as the various statistical analysis procedures that are to be applied in this study.

It was confirmed that the research is designed in such a manner that would adequately answer the identified research question in order to achieve the objectives of the study.

In the following Chapter 4 the empirical results of the study is reported.
Chapter 4

Empirical study results

If it can’t be expressed in figures, it is not science: it is opinion

- Lazarus Long
CHAPTER 4: EMPIRICAL RESULTS OF THE STUDY

4.1 Introduction

In Chapter 2 a literature perspective of the world-class organisation and the Safe Human Mindset Model (on which the SHMI is founded) were discussed. Chapter 3 addressed the design of the study and research methodology applied.

In this Chapter the empirical research results obtained through the application of the SHMI are reported and will be discussed in greater detail in Chapter 5.

4.2 Objective of the study

The objective of this study was to determine the Safe Mindset (safety motivational intent) of Managers, Shiftbosses and Miners in the target organisation with the aim to eliminate injuries and fatalities.

The primary empirical research objective discussed in Chapter 1 was to apply the SHMI to the production leaders (Managers, Shiftbosses and Miners) in the target organisation.

The results of the study should enable management to pro-actively plan to eliminate injuries and fatalities on the mine through improving the safe mindset of the leaders. To achieve this objective the study focused on identifying the safe mindset of the production leaders through the application of the SHMI (discussed in the previous chapter) designed for this purpose.

An integrative hypothesis was formulated in Chapter 1.

H 01 hypothesis:
There is no statistically significant difference between the safe mindset (motivational intent) of the three production leader levels (Managers, Shiftbosses and Miners) in the target organisation.

A Two-Phased approach presents the empirical results as follows:
Phase One focuses on sample statistics and descriptive statistics for frequency procedures, factor and reliability analysis, measures of central tendency and measures of variation. In Phase Two the empirical results of the statistical analysis procedures are analysed and interpreted with regards to the differences in the Safe Mindset of the three production leader levels with the objective of testing hypotheses.

4.3 Phase One: Sampling, frequency and descriptive statistics
Phase One addresses the sampling adequacy, frequency and descriptive statistical results.

4.3.1 Sample statistics
The Mine Manager approved the study where after the researcher briefed all participants on the nature of the research prior to them completing the questionnaire. Participants were provided with a formal letter of invitation and appreciation for participating in the study.

Miners and Shiftbosses completed the SHMI in sessions of 45 minutes to one hour separately from each other in groups of 15 to 20 people per session. Specific arrangements for night shift operations were made and participants working night shift completed the survey between 21h00 – 22h00 prior to proceeding on shift.

When the measuring instrument was to be completed by the Management levels, an information session with all participants (total populations) was held and the survey was distributed electronically to all participants and returned when hard copies were made for data processing purposes.

All Shiftbosses, Miners and Managers participated and, since the mine received 1 million fatality free shifts on three previous occasions great enthusiasm for the study was experienced.

Since the total populations for Managers ($N_1 = 18$), Shiftbosses ($N_2 = 28$) and Miners ($N_3 = 60$), were subjected to the study, the random sampling process are not applicable. Total number included in this survey is $N = 106$. 

362
The research study obtained responses on the 60 item SHMI from 106 respondents with no zero returns or partially completed questionnaires. All 106 returned questionnaires could thus be utilised for data processing purposes.

4.3.2 Frequency Analysis

4.3.2.1 Introduction
Frequency analysis (within descriptive statistics) will be addressed next and dwells on the description of the population included in the study (in this instance not a sample but the total population in each group) by means of counts and percentages (Coetzee, 2006). The composition of the respondents is depicted in Table 4-1 below:

Table 4-1 Frequency table of respondents

<table>
<thead>
<tr>
<th>Group</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>56.6</td>
<td>56.6</td>
<td>56.6</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>28</td>
<td>26.4</td>
<td>26.4</td>
<td>83.0</td>
</tr>
<tr>
<td>3 Manager</td>
<td>18</td>
<td>17.0</td>
<td>17.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

These levels were devoid of females therefore gender was not considered.

It is evident from the above that the various groups differ substantially in numbers and represents the typical distribution of a hierarchical type organisation where Managers are on a senior level, Shiftbosses on middle management level and Miners on a supervisory level.

With regards to tenure in the organisation, Table 4-2 below lists the period that all respondent Managers, Shiftbosses and Miners have served in the target organisation (The mine is only six years in production).
Table 4-2  Frequency table of Tenure in the Organisation – all respondents

<table>
<thead>
<tr>
<th>Year</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>1</td>
<td>20</td>
<td>18.8</td>
<td>18.9</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6</td>
<td>5.07</td>
<td>24.5</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>12</td>
<td>11.4</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>20</td>
<td>18.8</td>
<td>54.7</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>23</td>
<td>21.7</td>
<td>76.4</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>25</td>
<td>23.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>106</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

It is evident from Table 4-2 above that 80 respondents or 75% of all respondents have three years and longer service in the organisation. This will be examined in more detail below where the different groups (Managers, Shiftbosses and Miners) are displayed.

Table 4-3 illustrates the tenure of Managers in the organisation.

Table 4-3  Frequency table of Tenure for Managers in the Organisation

<table>
<thead>
<tr>
<th>Years</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>1</td>
<td>3</td>
<td>16.7</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>16.7</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2</td>
<td>11.1</td>
<td>44.4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3</td>
<td>16.7</td>
<td>61.1</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1</td>
<td>5.6</td>
<td>66.7</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>6</td>
<td>33.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>N = 18</td>
<td></td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

A total of 66.7% of all Managers has 3 years and longer service, while 83.4% of them have 2 years and longer service with the organisation.

Table 4-4 depicts the tenure of Shiftbosses in the organisation.
Table 4-4  Frequency table of Tenure for Shiftbosses in the organisation

<table>
<thead>
<tr>
<th>Year</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>21.4</td>
<td>21.4</td>
<td>21.4</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>3.6</td>
<td>3.6</td>
<td>25.0</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>10.7</td>
<td>10.7</td>
<td>35.7</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>21.4</td>
<td>21.4</td>
<td>57.1</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>17.9</td>
<td>17.9</td>
<td>75.0</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>25.0</td>
<td>25.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

From this Table it is evident that 75% of Shiftbosses had three years and longer service with the organisation while 21.4% are relatively new to the organisation (1 year service).

Table 4-5 below presents the tenure of Miners in the organisation.

Table 4-5  Frequency table of Tenure for Miners in the organisation

<table>
<thead>
<tr>
<th>Year</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>18.3</td>
<td>18.3</td>
<td>18.3</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>3.3</td>
<td>3.3</td>
<td>21.7</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>11.7</td>
<td>11.7</td>
<td>33.3</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>18.3</td>
<td>18.3</td>
<td>51.7</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
<td>28.3</td>
<td>28.3</td>
<td>80.0</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>20.0</td>
<td>20.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

The evidence from this Table reveals that 78.3% of all Miners have been in the service of the organisation for three years and longer.

Table 4-6 below depicts the ages of all respondents within age-specific groups.

Table 4-6  Frequency table of Age of all respondents

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td>14.0</td>
<td>14.2</td>
<td>14.2</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>30.8</td>
<td>31.1</td>
<td>45.3</td>
</tr>
<tr>
<td>3</td>
<td>44</td>
<td>41.1</td>
<td>41.5</td>
<td>86.8</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>13.1</td>
<td>13.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>99.1</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the evidence portrayed in Table 4-6, 55% of all respondents were 41 years and older and 45% were 40 years and younger.

Table 4-7 displays the ages of Managers, in the organisation.

### Table 4-7 Frequency table of Age of Managers in the organisation

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33.3</td>
<td>33.3</td>
<td>33.3</td>
</tr>
<tr>
<td>2</td>
<td>44.4</td>
<td>44.4</td>
<td>77.8</td>
</tr>
<tr>
<td>3</td>
<td>22.2</td>
<td>22.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

As noted in Table 4.7 above, 66.6% of Managers were older than 41 years and of these, 33.3% were older than 51 years.

Table 4-8 portrays the ages of the Shiftbosses in the organisation.

### Table 4-8 Frequency table of Age of Shiftbosses in the organisation

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14.3</td>
<td>14.3</td>
<td>14.3</td>
</tr>
<tr>
<td>2</td>
<td>32.1</td>
<td>32.1</td>
<td>46.4</td>
</tr>
<tr>
<td>3</td>
<td>35.7</td>
<td>35.7</td>
<td>82.1</td>
</tr>
<tr>
<td>4</td>
<td>17.9</td>
<td>17.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Total N</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
It is evident from the Table 4-8 that 53.6% of all Shiftbosses were 41 years and older and 46.4% were 40 years and younger.

Table 4-9 below illustrates the ages of Miners in the organisation.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>18.4</td>
<td>18.4</td>
<td>18.4</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
<td>30.0</td>
<td>30.0</td>
<td>48.4</td>
</tr>
<tr>
<td>3</td>
<td>26</td>
<td>43.3</td>
<td>43.3</td>
<td>91.7</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>8.3</td>
<td>8.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

It is evident from the above table that 51.6% of Miners were older than 41 years and 48.4% of Miners were 40 years and younger.

The item descriptive statistics for the Safe Human Measuring Instrument (SHMI) is discussed next.

4.3.3 Item descriptive statistics for the SHMI (Safe Human Measuring Instrument)

Descriptive statistics deal with quantitative statements about an attribute of a particular group of observations (responses) and does not necessarily imply generalisations (Struwig et al 2004).
The SHMI indicated that with the exception of six items (outliers), the overall majority (54 items) had a close to normal distribution since the means, median and modes were relatively close to one another. Struwig et al (2004) postulate that the mean, median and mode are measures of central tendency with the mean depicting the average score.

The degree to which scores are spread out measures dispersion and includes the standard deviation (Struwig et al 2004). Skewness refers to deviations from symmetry whilst kurtosis refers to peakness or flatness of the distribution (Struwig et al 2004).

The normal distribution is symmetrically distributed around the centre of all scores (Field 2005).

The values of the distribution are depicted in Table 4-10 below:

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.37</td>
<td>.735</td>
<td>-1.000</td>
<td>.235</td>
</tr>
<tr>
<td>Item 2</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.08</td>
<td>.789</td>
<td>-.846</td>
<td>.235</td>
</tr>
<tr>
<td>Item 3</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>1.77</td>
<td>.998</td>
<td>1.057</td>
<td>.235</td>
</tr>
<tr>
<td>Item 4</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.86</td>
<td>.798</td>
<td>-.770</td>
<td>.235</td>
</tr>
<tr>
<td>Item 5</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.25</td>
<td>.994</td>
<td>.318</td>
<td>.235</td>
</tr>
<tr>
<td>Item 6</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.59</td>
<td>1.031</td>
<td>-.179</td>
<td>.235</td>
</tr>
<tr>
<td>Item 7</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.19</td>
<td>.977</td>
<td>-1.077</td>
<td>.235</td>
</tr>
<tr>
<td>Item 8</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.45</td>
<td>.967</td>
<td>.136</td>
<td>.235</td>
</tr>
<tr>
<td>Item 9</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.15</td>
<td>.848</td>
<td>-1.154</td>
<td>.235</td>
</tr>
<tr>
<td>Item 10</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.25</td>
<td>.937</td>
<td>.317</td>
<td>.235</td>
</tr>
<tr>
<td>Item 11</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.29</td>
<td>.850</td>
<td>-1.267</td>
<td>.235</td>
</tr>
<tr>
<td>Item 12</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>1.58</td>
<td>.803</td>
<td>1.348</td>
<td>.235</td>
</tr>
<tr>
<td>Item 13</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.75</td>
<td>.817</td>
<td>-.243</td>
<td>.235</td>
</tr>
<tr>
<td>Item 14</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.21</td>
<td>.848</td>
<td>-.891</td>
<td>.235</td>
</tr>
<tr>
<td>Item 15</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.05</td>
<td>.748</td>
<td>-.634</td>
<td>.235</td>
</tr>
<tr>
<td>Item 16</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.83</td>
<td>.951</td>
<td>-.464</td>
<td>.235</td>
</tr>
<tr>
<td>Item 17</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.00</td>
<td>.936</td>
<td>.639</td>
<td>.235</td>
</tr>
<tr>
<td>Item 18</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.07</td>
<td>.959</td>
<td>.593</td>
<td>.235</td>
</tr>
<tr>
<td>Item 19</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.31</td>
<td>.709</td>
<td>-1.021</td>
<td>.235</td>
</tr>
<tr>
<td>Item 20</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.41</td>
<td>1.058</td>
<td>.105</td>
<td>.235</td>
</tr>
<tr>
<td>Item 21</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.85</td>
<td>.944</td>
<td>.522</td>
<td>.235</td>
</tr>
<tr>
<td>Item 22</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.08</td>
<td>.891</td>
<td>-.890</td>
<td>.235</td>
</tr>
<tr>
<td>Item 23</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.55</td>
<td>1.015</td>
<td>-.214</td>
<td>.235</td>
</tr>
<tr>
<td>Item 24</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.59</td>
<td>.954</td>
<td>-.309</td>
<td>.235</td>
</tr>
</tbody>
</table>

368
The implications of Table 4-10 are as follows:

- A mean is the arithmetic average of a group of scores (data) and in Table 4-10 ranges from 1.58 to 3.65. Field (2005) states that the mean is a hypothetical value as well as a model to summarise the data without actual observation. The mean for the scores depicted in Table 4-10 is 2.64.

- A standard deviation is the statistical index that reflects the degree of dispersion in a group of scores meaning that scores that are centred round a central value would depict a small standard deviation (Coetzee, 2006). Where scores are spread out from the central value, the standard deviation would be large. The standard deviations depicted in Table 4-10 indicated a range between 0.704 and

<table>
<thead>
<tr>
<th>Item 25</th>
<th>106</th>
<th>1</th>
<th>4</th>
<th>2.11</th>
<th>.929</th>
<th>.352</th>
<th>.235</th>
<th>-.816</th>
<th>.465</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 26</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.28</td>
<td>.902</td>
<td>-1.228</td>
<td>.235</td>
<td>.767</td>
<td>.465</td>
</tr>
<tr>
<td>Item 27</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.71</td>
<td>.862</td>
<td>-.212</td>
<td>.235</td>
<td>-.564</td>
<td>.465</td>
</tr>
<tr>
<td>Item 28</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>1.84</td>
<td>.937</td>
<td>.823</td>
<td>.235</td>
<td>-.352</td>
<td>.465</td>
</tr>
<tr>
<td>Item 29</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.26</td>
<td>.832</td>
<td>-1.139</td>
<td>.235</td>
<td>.970</td>
<td>.465</td>
</tr>
<tr>
<td>Item 30</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.93</td>
<td>.969</td>
<td>-.827</td>
<td>.235</td>
<td>-.157</td>
<td>.465</td>
</tr>
<tr>
<td>Item 31</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.88</td>
<td>.859</td>
<td>-.588</td>
<td>.235</td>
<td>-.097</td>
<td>.465</td>
</tr>
<tr>
<td>Item 32</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.09</td>
<td>.857</td>
<td>.650</td>
<td>.235</td>
<td>.020</td>
<td>.465</td>
</tr>
<tr>
<td>Item 33</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.65</td>
<td>.704</td>
<td>-2.388</td>
<td>.235</td>
<td>5.819</td>
<td>.465</td>
</tr>
<tr>
<td>Item 34</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.34</td>
<td>.893</td>
<td>.170</td>
<td>.235</td>
<td>-.685</td>
<td>.465</td>
</tr>
<tr>
<td>Item 35</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.84</td>
<td>.948</td>
<td>-.356</td>
<td>.235</td>
<td>-.806</td>
<td>.465</td>
</tr>
<tr>
<td>Item 36</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.78</td>
<td>.862</td>
<td>-.412</td>
<td>.235</td>
<td>-.156</td>
<td>.465</td>
</tr>
<tr>
<td>Item 37</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.71</td>
<td>.946</td>
<td>1.258</td>
<td>.235</td>
<td>1.341</td>
<td>.465</td>
</tr>
<tr>
<td>Item 38</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>1.66</td>
<td>.803</td>
<td>.078</td>
<td>.235</td>
<td>-1.181</td>
<td>.465</td>
</tr>
<tr>
<td>Item 39</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.41</td>
<td>1.049</td>
<td>.782</td>
<td>.235</td>
<td>1.638</td>
<td>.465</td>
</tr>
<tr>
<td>Item 40</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.81</td>
<td>.852</td>
<td>-.191</td>
<td>.235</td>
<td>-.669</td>
<td>.465</td>
</tr>
<tr>
<td>Item 41</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.74</td>
<td>.865</td>
<td>-.176</td>
<td>.235</td>
<td>-.011</td>
<td>.465</td>
</tr>
<tr>
<td>Item 42</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.60</td>
<td>1.002</td>
<td>-.175</td>
<td>.235</td>
<td>1.011</td>
<td>.465</td>
</tr>
<tr>
<td>Item 43</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.04</td>
<td>.780</td>
<td>-.803</td>
<td>.235</td>
<td>.768</td>
<td>.465</td>
</tr>
<tr>
<td>Item 44</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.10</td>
<td>1.086</td>
<td>.518</td>
<td>.235</td>
<td>-1.054</td>
<td>.465</td>
</tr>
<tr>
<td>Item 45</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.79</td>
<td>.902</td>
<td>-.607</td>
<td>.235</td>
<td>.260</td>
<td>.465</td>
</tr>
<tr>
<td>Item 46</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.27</td>
<td>.911</td>
<td>.275</td>
<td>.235</td>
<td>-.864</td>
<td>.465</td>
</tr>
<tr>
<td>Item 47</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.64</td>
<td>.819</td>
<td>-.521</td>
<td>.235</td>
<td>-.175</td>
<td>.465</td>
</tr>
<tr>
<td>Item 48</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.76</td>
<td>.799</td>
<td>-.344</td>
<td>.235</td>
<td>-.195</td>
<td>.465</td>
</tr>
<tr>
<td>Item 49</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.22</td>
<td>.828</td>
<td>.086</td>
<td>.235</td>
<td>-.685</td>
<td>.465</td>
</tr>
<tr>
<td>Item 50</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.18</td>
<td>.954</td>
<td>.302</td>
<td>.235</td>
<td>-.884</td>
<td>.465</td>
</tr>
<tr>
<td>Item 51</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.09</td>
<td>.911</td>
<td>.807</td>
<td>.235</td>
<td>-.110</td>
<td>.465</td>
</tr>
<tr>
<td>Item 52</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.22</td>
<td>.805</td>
<td>.254</td>
<td>.235</td>
<td>-.355</td>
<td>.465</td>
</tr>
<tr>
<td>Item 53</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.62</td>
<td>.867</td>
<td>-.342</td>
<td>.235</td>
<td>-.485</td>
<td>.465</td>
</tr>
<tr>
<td>Item 54</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.08</td>
<td>.825</td>
<td>.273</td>
<td>.235</td>
<td>-.628</td>
<td>.465</td>
</tr>
<tr>
<td>Item 55</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.84</td>
<td>.794</td>
<td>-.516</td>
<td>.235</td>
<td>.091</td>
<td>.465</td>
</tr>
<tr>
<td>Item 56</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.42</td>
<td>.882</td>
<td>.179</td>
<td>.235</td>
<td>-.635</td>
<td>.465</td>
</tr>
<tr>
<td>Item 57</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.54</td>
<td>.968</td>
<td>-.173</td>
<td>.235</td>
<td>-.924</td>
<td>.465</td>
</tr>
<tr>
<td>Item 58</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.61</td>
<td>.868</td>
<td>-.223</td>
<td>.235</td>
<td>-.561</td>
<td>.465</td>
</tr>
<tr>
<td>Item 59</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>2.86</td>
<td>.749</td>
<td>-.456</td>
<td>.235</td>
<td>.207</td>
<td>.465</td>
</tr>
<tr>
<td>Item 60</td>
<td>106</td>
<td>1</td>
<td>4</td>
<td>3.05</td>
<td>.809</td>
<td>-.856</td>
<td>.235</td>
<td>.695</td>
<td>.465</td>
</tr>
</tbody>
</table>

Valid N 106
1.086 and is therefore small which reflects a normal distribution despite the evidence of six outliers.

- Skewness refers to the shape of the distribution of scores (frequency distribution) and this shape is expressed as either symmetrical or asymmetrical (degree of deviation from symmetry (Struwig et al, 2004). The scores depicted in Table 4-10 range between -2.388 and 1.348 and seem to be slightly negatively distributed.

- Kurtosis according to Field (2005) refers to the degree that scores are steep (leptokurtic) or flat (platykurtic). Kurtosis relates to the middle part of the sample distribution according to Coetzee (2006). The Kurtosis scores in Table 4-10 above ranged between -1.196 and 5.819 and the distribution seems to be more peaked (leptokurtic) than normal.

The descriptive statistics for the SHMI is completed.
The normality of the SHMI is discussed next.

**Test for normality of the SHMI**

In order to determine the normality of the distribution, the Kolmogorov-Smirnov (a) test was applied.
The Kolmogorov - Smirnov (a) tests that the distribution confirms to normality.

Table 4-11 depicts the results of the Kolmogorov-Smirnov (a) test.

The frequencies reflect a normal distribution.

**Table 4- 11 Test of normality: Kolmogorov - Smirnov (a)**

<table>
<thead>
<tr>
<th>Tests of Normality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kolmogorov-Smirnov(a)</td>
</tr>
<tr>
<td>Statistic</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Mean score</td>
</tr>
</tbody>
</table>

* This is a lower bound of the true significance.

**a Lilliefors Significance Correction**

The p = .200, p > 0.05 result of the Kolmogorov-Smirnov (a) test was non significant and consequently did not deviate from normality (Field, 2005).
The normal frequency distribution facilitates the application of parametric tests (Field, 2005).

The results of the factor analysis are discussed next.

4.3.4 Results of the factor analysis
The principal component analysis was conducted and the total variance statistics are provided in Table 4-12 below:

**Table 4-12 Factor analysis: Total variance explained**

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>2</td>
<td>5.171</td>
<td>8.619</td>
</tr>
<tr>
<td>3</td>
<td>3.403</td>
<td>5.672</td>
</tr>
<tr>
<td>4</td>
<td>2.636</td>
<td>4.394</td>
</tr>
<tr>
<td>5</td>
<td>2.432</td>
<td>4.054</td>
</tr>
<tr>
<td>6</td>
<td>2.230</td>
<td>3.716</td>
</tr>
<tr>
<td>7</td>
<td>1.932</td>
<td>3.220</td>
</tr>
<tr>
<td>8</td>
<td>1.773</td>
<td>2.955</td>
</tr>
<tr>
<td>9</td>
<td>1.653</td>
<td>2.755</td>
</tr>
<tr>
<td>10</td>
<td>1.615</td>
<td>2.691</td>
</tr>
<tr>
<td>11</td>
<td>1.538</td>
<td>2.563</td>
</tr>
<tr>
<td>12</td>
<td>1.446</td>
<td>2.410</td>
</tr>
<tr>
<td>13</td>
<td>1.360</td>
<td>2.266</td>
</tr>
<tr>
<td>14</td>
<td>1.247</td>
<td>2.079</td>
</tr>
<tr>
<td>15</td>
<td>1.196</td>
<td>1.994</td>
</tr>
<tr>
<td>16</td>
<td>1.152</td>
<td>1.920</td>
</tr>
<tr>
<td>17</td>
<td>1.004</td>
<td>1.673</td>
</tr>
<tr>
<td>18</td>
<td>.959</td>
<td>1.598</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>19</td>
<td>.935</td>
<td>1.558</td>
</tr>
<tr>
<td>20</td>
<td>.889</td>
<td>1.481</td>
</tr>
<tr>
<td>21</td>
<td>.861</td>
<td>1.434</td>
</tr>
<tr>
<td>22</td>
<td>.854</td>
<td>1.424</td>
</tr>
<tr>
<td>23</td>
<td>.792</td>
<td>1.319</td>
</tr>
<tr>
<td>24</td>
<td>.715</td>
<td>1.192</td>
</tr>
<tr>
<td>25</td>
<td>.684</td>
<td>1.140</td>
</tr>
<tr>
<td>26</td>
<td>.676</td>
<td>1.127</td>
</tr>
<tr>
<td>27</td>
<td>.650</td>
<td>1.084</td>
</tr>
<tr>
<td>28</td>
<td>.624</td>
<td>1.040</td>
</tr>
<tr>
<td>29</td>
<td>.570</td>
<td>.950</td>
</tr>
<tr>
<td>30</td>
<td>.557</td>
<td>.928</td>
</tr>
<tr>
<td>31</td>
<td>.504</td>
<td>.840</td>
</tr>
<tr>
<td>32</td>
<td>.498</td>
<td>.830</td>
</tr>
<tr>
<td>33</td>
<td>.450</td>
<td>.751</td>
</tr>
<tr>
<td>34</td>
<td>.400</td>
<td>.666</td>
</tr>
<tr>
<td>35</td>
<td>.386</td>
<td>.644</td>
</tr>
<tr>
<td>36</td>
<td>.369</td>
<td>.614</td>
</tr>
<tr>
<td>37</td>
<td>.361</td>
<td>.602</td>
</tr>
<tr>
<td>38</td>
<td>.334</td>
<td>.556</td>
</tr>
<tr>
<td>39</td>
<td>.316</td>
<td>.527</td>
</tr>
<tr>
<td>40</td>
<td>.307</td>
<td>.512</td>
</tr>
<tr>
<td>41</td>
<td>.279</td>
<td>.465</td>
</tr>
<tr>
<td>42</td>
<td>.271</td>
<td>.452</td>
</tr>
<tr>
<td>43</td>
<td>.251</td>
<td>.418</td>
</tr>
<tr>
<td>44</td>
<td>.241</td>
<td>.402</td>
</tr>
<tr>
<td>45</td>
<td>.218</td>
<td>.364</td>
</tr>
<tr>
<td>46</td>
<td>.205</td>
<td>.341</td>
</tr>
<tr>
<td>47</td>
<td>.190</td>
<td>.317</td>
</tr>
<tr>
<td>48</td>
<td>.181</td>
<td>.302</td>
</tr>
<tr>
<td>49</td>
<td>.161</td>
<td>.269</td>
</tr>
<tr>
<td>50</td>
<td>.150</td>
<td>.250</td>
</tr>
<tr>
<td>51</td>
<td>.136</td>
<td>.227</td>
</tr>
<tr>
<td>52</td>
<td>.128</td>
<td>.213</td>
</tr>
<tr>
<td>53</td>
<td>.123</td>
<td>.205</td>
</tr>
</tbody>
</table>
A total number of 17 components (factors) were extracted that reflected an eigenvalue >1 according to the Kaiser criterion (Field, 2005). The seventeen factors that were retained could explain 72% of the variance in data.

The factor analyses of the items are portrayed in Table 4-13. During factor analysis the proportion of common variance in a variable is determined and expressed as the communality (Field, 2005). The communality is a measure of the proportion of variance explained by the extracted factors and varies between 0 and 1. Communality of > .5 indicates high communality (Field, 2005).

Table 4.13 depicts the factor analysis: communalities.

**Table 4-13 Factor Analysis: Communalities**

<table>
<thead>
<tr>
<th>Item</th>
<th>Initial</th>
<th>Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>item1</td>
<td>1.000</td>
<td>.680</td>
</tr>
<tr>
<td>item2</td>
<td>1.000</td>
<td>.747</td>
</tr>
<tr>
<td>r.item3</td>
<td>1.000</td>
<td>.658</td>
</tr>
<tr>
<td>item4</td>
<td>1.000</td>
<td>.715</td>
</tr>
<tr>
<td>r.item5</td>
<td>1.000</td>
<td>.750</td>
</tr>
<tr>
<td>r.item6</td>
<td>1.000</td>
<td>.784</td>
</tr>
<tr>
<td>item7</td>
<td>1.000</td>
<td>.770</td>
</tr>
<tr>
<td>r.item8</td>
<td>1.000</td>
<td>.718</td>
</tr>
<tr>
<td>item9</td>
<td>1.000</td>
<td>.671</td>
</tr>
<tr>
<td>Item</td>
<td>Value1</td>
<td>Value2</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>r.item10</td>
<td>1.000</td>
<td>.774</td>
</tr>
<tr>
<td>Item11</td>
<td>1.000</td>
<td>.689</td>
</tr>
<tr>
<td>r.item12</td>
<td>1.000</td>
<td>.654</td>
</tr>
<tr>
<td>Item13</td>
<td>1.000</td>
<td>.734</td>
</tr>
<tr>
<td>Item14</td>
<td>1.000</td>
<td>.714</td>
</tr>
<tr>
<td>Item15</td>
<td>1.000</td>
<td>.669</td>
</tr>
<tr>
<td>Item16</td>
<td>1.000</td>
<td>.753</td>
</tr>
<tr>
<td>r.item17</td>
<td>1.000</td>
<td>.767</td>
</tr>
<tr>
<td>r.item18</td>
<td>1.000</td>
<td>.675</td>
</tr>
<tr>
<td>Item19</td>
<td>1.000</td>
<td>.716</td>
</tr>
<tr>
<td>r.item20</td>
<td>1.000</td>
<td>.743</td>
</tr>
<tr>
<td>Item21</td>
<td>1.000</td>
<td>.686</td>
</tr>
<tr>
<td>Item22</td>
<td>1.000</td>
<td>.748</td>
</tr>
<tr>
<td>Item23</td>
<td>1.000</td>
<td>.728</td>
</tr>
<tr>
<td>Item24</td>
<td>1.000</td>
<td>.748</td>
</tr>
<tr>
<td>r.item25</td>
<td>1.000</td>
<td>.686</td>
</tr>
<tr>
<td>Item26</td>
<td>1.000</td>
<td>.684</td>
</tr>
<tr>
<td>Item27</td>
<td>1.000</td>
<td>.765</td>
</tr>
<tr>
<td>r.item28</td>
<td>1.000</td>
<td>.705</td>
</tr>
<tr>
<td>Item29</td>
<td>1.000</td>
<td>.783</td>
</tr>
<tr>
<td>Item30</td>
<td>1.000</td>
<td>.790</td>
</tr>
<tr>
<td>Item31</td>
<td>1.000</td>
<td>.782</td>
</tr>
<tr>
<td>r.item32</td>
<td>1.000</td>
<td>.741</td>
</tr>
<tr>
<td>Item33</td>
<td>1.000</td>
<td>.796</td>
</tr>
<tr>
<td>r.item34</td>
<td>1.000</td>
<td>.749</td>
</tr>
<tr>
<td>Item35</td>
<td>1.000</td>
<td>.687</td>
</tr>
<tr>
<td>r.item36</td>
<td>1.000</td>
<td>.733</td>
</tr>
<tr>
<td>r.item37</td>
<td>1.000</td>
<td>.706</td>
</tr>
<tr>
<td>r.item38</td>
<td>1.000</td>
<td>.727</td>
</tr>
<tr>
<td>r.item39</td>
<td>1.000</td>
<td>.612</td>
</tr>
<tr>
<td>Item40</td>
<td>1.000</td>
<td>.743</td>
</tr>
<tr>
<td>Item41</td>
<td>1.000</td>
<td>.630</td>
</tr>
<tr>
<td>Item42</td>
<td>1.000</td>
<td>.733</td>
</tr>
<tr>
<td>Item43</td>
<td>1.000</td>
<td>.745</td>
</tr>
<tr>
<td>r.item44</td>
<td>1.000</td>
<td>.717</td>
</tr>
<tr>
<td>item</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>---</td>
</tr>
<tr>
<td>r.item45</td>
<td>1.000</td>
<td>.756</td>
</tr>
<tr>
<td>item46</td>
<td>1.000</td>
<td>.647</td>
</tr>
<tr>
<td>item47</td>
<td>1.000</td>
<td>.721</td>
</tr>
<tr>
<td>item48</td>
<td>1.000</td>
<td>.740</td>
</tr>
<tr>
<td>r.item49</td>
<td>1.000</td>
<td>.772</td>
</tr>
<tr>
<td>r.item50</td>
<td>1.000</td>
<td>.792</td>
</tr>
<tr>
<td>item51</td>
<td>1.000</td>
<td>.649</td>
</tr>
<tr>
<td>r.item52</td>
<td>1.000</td>
<td>.716</td>
</tr>
<tr>
<td>item53</td>
<td>1.000</td>
<td>.639</td>
</tr>
<tr>
<td>r.item54</td>
<td>1.000</td>
<td>.740</td>
</tr>
<tr>
<td>item55</td>
<td>1.000</td>
<td>.775</td>
</tr>
<tr>
<td>r.item56</td>
<td>1.000</td>
<td>.737</td>
</tr>
<tr>
<td>r.item57</td>
<td>1.000</td>
<td>.696</td>
</tr>
<tr>
<td>item58</td>
<td>1.000</td>
<td>.674</td>
</tr>
<tr>
<td>item59</td>
<td>1.000</td>
<td>.678</td>
</tr>
<tr>
<td>item60</td>
<td>1.000</td>
<td>.751</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

The minimum communality is .61 and the maximum communality is .79.

The average communality = 0.66, which is >.5 depicts high communality (>0.5) confirming validity (Field, 2005).

4.3.5 Results of the reliability analysis

The reliability analysis includes item analysis and factor analysis and was conducted on the results of the SHMI.

Table 4-14 depicts the case processing summary results of the SHMI

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded(a)</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>
a Listwise deletion based on all variables in the procedure.

Table 4-14 indicates that a total of 106 responses were included in the analysis with zero exclusions.
Table 4-15 depicts the reliability statistics from the reliability analysis.

**Table 4-15  Reliability statistics**

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
</tr>
<tr>
<td>.887</td>
</tr>
</tbody>
</table>

Table 4-15 indicates a Cronbach Alpha Coefficient of 0.887 for 60 items.

The primary goals of each item analysis are the improvement of total score reliability and/or total score validity, the achievement of improved item sequences as well as types of score distributions (Coetzee, 2006).

The output of item analysis procedures is differentiation amongst better or poorer items (Coetzee, 2006).
Table 4.16 lists the item total statistics with the Cronbach Alpha Coefficient (reliability coefficient) if the item is deleted.

**Table 4-16 Item total statistics for the SHMI**

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item-Total Statistics</td>
</tr>
<tr>
<td>Scale Mean if Item Deleted</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>item1</td>
</tr>
<tr>
<td>item2</td>
</tr>
<tr>
<td>r.item3</td>
</tr>
<tr>
<td>item4</td>
</tr>
<tr>
<td>r.item5</td>
</tr>
<tr>
<td>r.item6</td>
</tr>
<tr>
<td>item7</td>
</tr>
<tr>
<td>Item</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>item8</td>
</tr>
<tr>
<td>item9</td>
</tr>
<tr>
<td>r.item10</td>
</tr>
<tr>
<td>item11</td>
</tr>
<tr>
<td>r.item12</td>
</tr>
<tr>
<td>item13</td>
</tr>
<tr>
<td>item14</td>
</tr>
<tr>
<td>item15</td>
</tr>
<tr>
<td>item16</td>
</tr>
<tr>
<td>r.item17</td>
</tr>
<tr>
<td>item18</td>
</tr>
<tr>
<td>item19</td>
</tr>
<tr>
<td>r.item20</td>
</tr>
<tr>
<td>item21</td>
</tr>
<tr>
<td>item22</td>
</tr>
<tr>
<td>item23</td>
</tr>
<tr>
<td>item24</td>
</tr>
<tr>
<td>r.item25</td>
</tr>
<tr>
<td>item26</td>
</tr>
<tr>
<td>item27</td>
</tr>
<tr>
<td>r.item28</td>
</tr>
<tr>
<td>item29</td>
</tr>
<tr>
<td>item30</td>
</tr>
<tr>
<td>item31</td>
</tr>
<tr>
<td>r.item32</td>
</tr>
<tr>
<td>item33</td>
</tr>
<tr>
<td>r.item34</td>
</tr>
<tr>
<td>item35</td>
</tr>
<tr>
<td>r.item36</td>
</tr>
<tr>
<td>r.item37</td>
</tr>
<tr>
<td>item38</td>
</tr>
<tr>
<td>r.item39</td>
</tr>
<tr>
<td>item40</td>
</tr>
<tr>
<td>item41</td>
</tr>
<tr>
<td>item42</td>
</tr>
<tr>
<td>Item</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>item43</td>
</tr>
<tr>
<td>r.item44</td>
</tr>
<tr>
<td>item45</td>
</tr>
<tr>
<td>r.item46</td>
</tr>
<tr>
<td>item47</td>
</tr>
<tr>
<td>item48</td>
</tr>
<tr>
<td>r.item49</td>
</tr>
<tr>
<td>r.item50</td>
</tr>
<tr>
<td>item51</td>
</tr>
<tr>
<td>r.item52</td>
</tr>
<tr>
<td>item53</td>
</tr>
<tr>
<td>r.item54</td>
</tr>
<tr>
<td>item55</td>
</tr>
<tr>
<td>r.item56</td>
</tr>
<tr>
<td>r.item57</td>
</tr>
<tr>
<td>item58</td>
</tr>
<tr>
<td>item59</td>
</tr>
<tr>
<td>item60</td>
</tr>
</tbody>
</table>

| N of items | 60 | Mean | 170.18 |
| N of cases | 106 | Variance | 373.120 |
| Cronbach Coefficient | Alpha 0.887 | Std. Deviation | 19.316 |

Although the Cronbach Alpha Coefficient depicted in Table 4-15 indicated high reliability (.89 >.7), a closer examination of items 8, 18 and 38 depicted in Table 4-16 is required.

When items 8, 18 and 38 depicted in Table 4-16 were reflected, an increased Cronbach Alpha Coefficient was obtained which is reflected in Table 4-17.

The case - processing summary depicted in Table 4-14 is retained.
The Cronbach Alpha Coefficient of .911 > .7 indicated high reliability.
The item total statistics for the SHMI post reflected items are depicted in Table 4-18 with the reliability Cronbach Coefficient Alpha values if the items were deleted.

Coetzee (2006) avers that the major goals of item analysis are the improvement of total score reliability and or validity, the achievement of improved items sequence as well as improved score distributions.

### Table 4-17 Reliability results: reflected items

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach’s Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.911</td>
<td>60</td>
</tr>
</tbody>
</table>

The Cronbach Alpha Coefficient of .911 > .7 indicated high reliability.

### Table 4-18 Item total statistics for the SHMI – post reflected items

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach’s Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>item1</td>
<td>169.45</td>
<td>442.364</td>
<td>.450</td>
<td>.909</td>
</tr>
<tr>
<td>item2</td>
<td>169.75</td>
<td>441.354</td>
<td>.448</td>
<td>.909</td>
</tr>
<tr>
<td>r.item3</td>
<td>169.59</td>
<td>453.215</td>
<td>.061</td>
<td>.913</td>
</tr>
<tr>
<td>item4</td>
<td>169.96</td>
<td>443.846</td>
<td>.367</td>
<td>.910</td>
</tr>
<tr>
<td>r.item5</td>
<td>170.07</td>
<td>448.748</td>
<td>.179</td>
<td>.912</td>
</tr>
<tr>
<td>r.item6</td>
<td>170.42</td>
<td>440.702</td>
<td>.348</td>
<td>.910</td>
</tr>
<tr>
<td>item7</td>
<td>169.63</td>
<td>431.073</td>
<td>.611</td>
<td>.907</td>
</tr>
<tr>
<td>r.item8</td>
<td>170.27</td>
<td>442.391</td>
<td>.331</td>
<td>.910</td>
</tr>
<tr>
<td>item9</td>
<td>169.67</td>
<td>442.490</td>
<td>.381</td>
<td>.910</td>
</tr>
<tr>
<td>r.item10</td>
<td>170.08</td>
<td>451.099</td>
<td>.122</td>
<td>.912</td>
</tr>
<tr>
<td>item11</td>
<td>169.53</td>
<td>445.128</td>
<td>.306</td>
<td>.910</td>
</tr>
<tr>
<td>r.item12</td>
<td>169.41</td>
<td>445.577</td>
<td>.312</td>
<td>.910</td>
</tr>
<tr>
<td>item13</td>
<td>170.08</td>
<td>443.994</td>
<td>.353</td>
<td>.910</td>
</tr>
<tr>
<td>item14</td>
<td>169.61</td>
<td>436.411</td>
<td>.556</td>
<td>.908</td>
</tr>
<tr>
<td>item15</td>
<td>169.77</td>
<td>438.901</td>
<td>.554</td>
<td>.908</td>
</tr>
<tr>
<td>item16</td>
<td>169.99</td>
<td>434.219</td>
<td>.547</td>
<td>.908</td>
</tr>
<tr>
<td>r.item17</td>
<td>169.82</td>
<td>444.739</td>
<td>.284</td>
<td>.911</td>
</tr>
<tr>
<td>Item</td>
<td>Price</td>
<td>Value</td>
<td>Weight</td>
<td>Length</td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>r.item18</td>
<td>169.89</td>
<td>437.625</td>
<td>.455</td>
<td>.909</td>
</tr>
<tr>
<td>item19</td>
<td>169.51</td>
<td>438.405</td>
<td>.603</td>
<td>.908</td>
</tr>
<tr>
<td>r.item20</td>
<td>170.23</td>
<td>435.567</td>
<td>.456</td>
<td>.909</td>
</tr>
<tr>
<td>item21</td>
<td>169.97</td>
<td>436.866</td>
<td>.483</td>
<td>.909</td>
</tr>
<tr>
<td>item22</td>
<td>169.75</td>
<td>433.449</td>
<td>.608</td>
<td>.908</td>
</tr>
<tr>
<td>item23</td>
<td>170.27</td>
<td>434.239</td>
<td>.509</td>
<td>.908</td>
</tr>
<tr>
<td>item24</td>
<td>170.23</td>
<td>431.377</td>
<td>.619</td>
<td>.907</td>
</tr>
<tr>
<td>r.item25</td>
<td>169.93</td>
<td>436.158</td>
<td>.510</td>
<td>.908</td>
</tr>
<tr>
<td>item26</td>
<td>169.54</td>
<td>452.556</td>
<td>.090</td>
<td>.912</td>
</tr>
<tr>
<td>item27</td>
<td>170.11</td>
<td>445.454</td>
<td>.292</td>
<td>.910</td>
</tr>
<tr>
<td>r.item28</td>
<td>169.66</td>
<td>452.779</td>
<td>.079</td>
<td>.912</td>
</tr>
<tr>
<td>item29</td>
<td>169.56</td>
<td>438.954</td>
<td>.493</td>
<td>.909</td>
</tr>
<tr>
<td>item30</td>
<td>169.89</td>
<td>437.397</td>
<td>.456</td>
<td>.909</td>
</tr>
<tr>
<td>item31</td>
<td>169.94</td>
<td>436.054</td>
<td>.558</td>
<td>.908</td>
</tr>
<tr>
<td>r.item32</td>
<td>169.92</td>
<td>441.069</td>
<td>.417</td>
<td>.909</td>
</tr>
<tr>
<td>item33</td>
<td>169.17</td>
<td>451.228</td>
<td>.170</td>
<td>.911</td>
</tr>
<tr>
<td>r.item34</td>
<td>170.16</td>
<td>446.860</td>
<td>.242</td>
<td>.911</td>
</tr>
<tr>
<td>item35</td>
<td>169.98</td>
<td>449.428</td>
<td>.162</td>
<td>.912</td>
</tr>
<tr>
<td>r.item36</td>
<td>170.60</td>
<td>452.184</td>
<td>.106</td>
<td>.912</td>
</tr>
<tr>
<td>r.item37</td>
<td>170.53</td>
<td>448.994</td>
<td>.173</td>
<td>.912</td>
</tr>
<tr>
<td>r.item38</td>
<td>169.48</td>
<td>443.319</td>
<td>.380</td>
<td>.910</td>
</tr>
<tr>
<td>r.item39</td>
<td>170.23</td>
<td>446.386</td>
<td>.210</td>
<td>.911</td>
</tr>
<tr>
<td>item40</td>
<td>170.01</td>
<td>446.048</td>
<td>.279</td>
<td>.911</td>
</tr>
<tr>
<td>item41</td>
<td>170.08</td>
<td>447.659</td>
<td>.230</td>
<td>.911</td>
</tr>
<tr>
<td>item42</td>
<td>170.22</td>
<td>432.000</td>
<td>.572</td>
<td>.908</td>
</tr>
<tr>
<td>item43</td>
<td>169.78</td>
<td>434.648</td>
<td>.663</td>
<td>.907</td>
</tr>
<tr>
<td>r.item44</td>
<td>169.92</td>
<td>438.356</td>
<td>.380</td>
<td>.910</td>
</tr>
<tr>
<td>item45</td>
<td>170.03</td>
<td>435.552</td>
<td>.543</td>
<td>.908</td>
</tr>
<tr>
<td>r.item46</td>
<td>170.09</td>
<td>451.362</td>
<td>.119</td>
<td>.912</td>
</tr>
<tr>
<td>item47</td>
<td>170.18</td>
<td>439.996</td>
<td>.470</td>
<td>.909</td>
</tr>
<tr>
<td>item48</td>
<td>170.06</td>
<td>441.216</td>
<td>.445</td>
<td>.909</td>
</tr>
<tr>
<td>r.item49</td>
<td>170.04</td>
<td>446.513</td>
<td>.275</td>
<td>.911</td>
</tr>
<tr>
<td>r.item50</td>
<td>170.00</td>
<td>439.848</td>
<td>.401</td>
<td>.909</td>
</tr>
<tr>
<td>item51</td>
<td>169.73</td>
<td>439.324</td>
<td>.437</td>
<td>.909</td>
</tr>
<tr>
<td>r.item52</td>
<td>170.04</td>
<td>445.560</td>
<td>.312</td>
<td>.910</td>
</tr>
</tbody>
</table>
N of items – 60       Mean – 172.82
N of cases – 106     Variance – 456.815
Cronbach Coefficient Alpha – 0.911   Std. Deviation – 21.373

The Safe Human Mindset Measuring Instrument (SHMI) has been applied in three
different mining companies in South Africa namely gold, copper and chrome
(N=11929) prior to its application on the platinum mine included in this study.

The Cronbach Alpha coefficients for the total three mining companies are depicted in
Table 4-19 below and display the constructs of the Safe Human Mindset Model, the
total of respondents and the corresponding Cronbach Alpha values.

As stated previously, confidentiality and Trade Mark protection of intellectual
property is applicable and all statistical analysis is governed by the University of
North West (Potchefstroom – Department of Statistics) and is available on request.

Table 4- 19 Cronbach Coefficient Alphas: Previous application of the SHMI

<table>
<thead>
<tr>
<th>Construct</th>
<th>N</th>
<th>Cronbach Coefficient</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship credibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Trust</td>
<td>12162</td>
<td></td>
<td>0.72</td>
</tr>
<tr>
<td>· Caring Support</td>
<td>12212</td>
<td></td>
<td>0.82</td>
</tr>
<tr>
<td>· Respect</td>
<td>12186</td>
<td></td>
<td>0.78</td>
</tr>
<tr>
<td>· Ownership</td>
<td>12150</td>
<td></td>
<td>0.81</td>
</tr>
</tbody>
</table>
Climate

- Workforce satisfaction 12262 0,79
- Attitude towards the job 11970 0,58
- Attitude towards the organisation 12112 0,65
- Work environment 12256 0,80
- Physical environment 11984 0,85
- Safety intent 12144 0,71

Culture (values and beliefs)

- Values 11929 0,80
- Common beliefs 11994 0,72

Conclusion

- The application of the SHMI in three mining companies prior to this study confirms the reliability of the SHMI (Cronbach- Coefficient Alpha .78 which is >.7).
- The total populations of Managers, Shiftbosses and Miners on the mine included in this study were subjected to the SHMI. Considering the ages within the three population groups it is evident that 50% and more of all incumbents are 40 years and older.
- The normal frequency distribution facilitates the application of parametric tests, which are discussed in Phase Two that follows.
- The Cronbach Alpha Coefficient of 0.911 for the SHMI applied in this study indicates high reliability.
- The average communality of 0.66 for factor analysis in this study indicates acceptable validity.

The descriptive statistical processes and results, reliability of the SHMI applied as well as the results for the factor analysis for purposes of this study concludes Phase One.

Phase Two addresses the various statistical analyses processes applied, together with the empirical results with the aim of testing hypotheses and is discussed next.
4.4 Phase Two

Phase One focused on the descriptive statistics of the SHMI and, accepting the statistical evidence presented in Phase One, Phase Two focuses on the testing of hypothesis.

According to Struwig et al (2004) a hypothesis is a declarative proposition or statement in a testable format regarding the relationship between two or more variables. They also assert that the primary objective of quantitative research is to test hypotheses.

Two types of hypotheses are distinguished (Field, 2005), the null hypothesis and the experimental hypothesis.
- The null hypothesis is a statistical statement postulating that no relationship or difference exists between two or more variables studied (Coetzee, 2006).
- The experimental hypothesis postulates that a relationship or difference exists between some of the two or more variables studied or subjected to experimental manipulation (Field, 2005).

Coetzee (2006) points out that when a specific relationship between the variables being studied exists, the hypothesis could indicate direction on the condition that specific theoretical evidence exists.

The statistical analysis was conducted on three levels. The first level of analysis addresses the Safe Human Mindset Index. The second level of statistical analysis addresses the constructs of Relationship Credibility, Climate and Culture (which the SHMI measures), and the third level of statistical analysis addresses the various sub constructs, those which reflected acceptable Cronbach Alpha Coefficient values >.7.

Sub-hypotheses were stated in terms of the stated three levels of statistical analysis and were discussed in Phase Two.

4.4.1 Testing of hypotheses
As a result of the acceptance of the statistical evidence in Phase One, (frequency
distribution, reliability, validity and factor analysis), parametric, non-parametric and
post hoc procedures were applied within the three levels of statistical analysis.

Inferential statistics are used to infer observations probably found in a population and
include parametric and non-parametric statistics (Struwig et al, 2004). Analysis of
variance was applied to establish whether groups differed statistically significantly
with regards to their mean scores (Struwig et al, 2004).

A one-way ANOVA was applied since it overcomes Type 1 errors of rejecting the null
hypothesis prematurely (Field, 2005).

The differences between individuals in groups and variances due to differences
between groups necessitate analysis of variance on the data to determine
significance in the difference between means (Coetzee, 2006).

The parametric and non-parametric tests and Multiple Comparisons Post Hoc Tests
applied in analysing variance and testing of hypothesis were:

- One Way – ANOVA Univariate analysis of variance-descriptive statistics
- Levene's Test of Equality of Error Variances (homogeneity of variance)
- Anova F-ratio Test of Between Subject Effects (homogeneity of variance)
- Brown-Forsythe Robust Test of Equality of Means (heterogeneity of variance)
- Kruskal-Wallis rank and test statistics (a, b) test (non parametric version of
  ANOVA)
- Scheffé and Dunnett T 3 Multiple Comparisons Post Hoc Tests

ANOVA calculations were applied at all three levels of analysis. Since ANOVA uses
squared deviations, for each group and between groups its own mean and deviation
from the mean were calculated.

A grand mean was calculated for all means and the total deviation is the sum of the
squared differences between each data point and the overall mean.
Homogeneity of variance (Levene’s test) calculated whether variance was equal amongst groups. When homogeneity of variance is established, Brown-Forsythe (F-ratio) calculates that the variance between-groups and within-groups is not a chance result. The closer the F-ratio to 1 (sig. = p) > .05 the more confidently one becomes of the acceptance of the null hypothesis.

When an assumption of ANOVA was violated (heterogeneity of variance) the F-ratio was calculated as a step to correct the violation of ANOVA.

The Kruskal-Wallis non-parametric test was applied in all three levels to confirm within group variances, especially where F-ratio calculations could not be applied as a result of heterogeneity of variance (ANOVA assumption broken).

The application of the Dunnett T3 (subsequent to the Brown-Forsythe) and Scheffé (subsequent to the ANOVA F-ratio) post hoc tests were applied as a multiple comparisons test to compare the three leader groups with one another.

Based on the literature review, the following integrative hypothesis is formulated:

**Hypothesis HO1**
There is no statistically significant difference between the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners in the target organisation.

**Rationale**: A study of the relevant literature could not support the differences in the safety mindset of Managers, Shiftbosses and Miners.

Eight (8) sub hypotheses will be postulated and discussed regarding the safe mindset of Managers, Shiftbosses and Miners in the target organisation.

As a consequence of the normal distribution of data, parametric tests were applied on the data obtained through the application of the SHMI on the three production leader levels. In addition, a non-parametric test was also applied when heterogeneity of variance occurred.
4.4.1.1 The first level of statistical analysis

The first level of statistical analysis addressed the Managers, Shiftbosses and Miners with regards to their safe mindset (overall result of the SHMI).

Hypothesis H01

There is no statistically significant difference between the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners.

Rationale: Based on the fact that no evidence in the literature could be found to support the relationship between the safe mindset of production leaders, hypothesis H01 is stated in a non-directional way.

In order to test hypothesis H01, the following statistical analysis procedures were applied:

- One-way ANOVA descriptive statistics
- Levene's test of Equality of Error Variances (a)
- Brown-Forsythe Robust test of Equality of Means
- Kruskal-Wallis Test Ranks and Test statistics (a, b) (non-parametric version of ANOVA)
- Dunnett T3 Multiple Comparisons Post Hoc Test

Table 4-20 depicts the results of the descriptive statistics One-Way ANOVA results for the three leader groups.

Table 4-20 Descriptive statistics for the three leader groups and the SHMI

<table>
<thead>
<tr>
<th>Descriptives</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
</tr>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>2.8017</td>
<td>.38196</td>
<td>.04931</td>
<td>2.7030</td>
<td>2.9003</td>
<td>1.83</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>28</td>
<td>2.9101</td>
<td>.29860</td>
<td>.05643</td>
<td>2.7943</td>
<td>3.0259</td>
<td>2.38</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>3.0963</td>
<td>.25124</td>
<td>.05922</td>
<td>2.9714</td>
<td>3.2212</td>
<td>2.62</td>
</tr>
</tbody>
</table>
Considering the mean score for Miners, Shiftbosses and Managers, the 95% confidence level for the mean appears not to vary significantly.

Levene's test was designed to test the null hypothesis that the common variance for the three groups was the same when applied (Field, 2005). Levene's test is testing (homogeneity of variance) whether the variances of the three groups are statistically different (Field, 2005). When $p < 0.05$ ($p = \text{sig. value}$) then the assumption is made that the variances are statistically significant.

The results of Levene's test are depicted in Table 4-21 below:

<table>
<thead>
<tr>
<th>Test of Homogeneity of Variances</th>
<th>Meanscore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levene Statistic</td>
<td>df1</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----</td>
</tr>
<tr>
<td>3.303</td>
<td>2</td>
</tr>
</tbody>
</table>

The result of $F (2,103) = 3.30, p = .041, p < .05$ indicates a significantly different variance within the groups which indicated an assumption of Anova (variance is equal across groups) was violated.

A robust test of Equality of Means (equivalent to F-ratio) was applied when an Anova assumption was violated (alternative to Anova).

The results of the Brown-Forsythe test are displayed in Table 4-22 below:

<table>
<thead>
<tr>
<th>Robust Tests of Equality of Means</th>
<th>Meanscore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistic(a)</td>
<td>df1</td>
</tr>
<tr>
<td>----------------</td>
<td>-----</td>
</tr>
<tr>
<td>Brown-Forsythe</td>
<td>6.815</td>
</tr>
</tbody>
</table>

a Asymptotically F distributed.
The result of the Brown-Forsythe test $F(2,84) = 6.81, \ p= .002, \ p < .05$ confirmed the result was not a chance result.

Since one of the assumptions of Anova was violated (as a parametric test), the Kruskal-Wallis (non-parametric) test was applied to confirm within group variances.

Field (2005) postulates the Kruskal-Wallis test is the non-parametric version of Anova (parametric test). The Kruskal-Wallis test is also applied when sample sizes are relatively small as is the case in this study. The results of the Kruskal-Wallis test are illustrated in Table 4-23 below and Table 4-24 represents the test statistic.

Table 4- 23  Kruskal-Wallis Test Ranks SHMI

<table>
<thead>
<tr>
<th></th>
<th>Ranks</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
<td>N</td>
<td>Mean Rank</td>
<td></td>
</tr>
<tr>
<td>Mean Score</td>
<td>1 Miner</td>
<td>60</td>
<td>47.10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>28</td>
<td>55.30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>18</td>
<td>72.03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>106</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4- 24  Kruskal - Wallis Test Statistics (a, b)

<table>
<thead>
<tr>
<th>Test Statistics (a, b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meanscore</td>
</tr>
<tr>
<td>Chi-Square</td>
</tr>
<tr>
<td>df</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
</tr>
</tbody>
</table>

a Kruskal Wallis Test
b Grouping Variable: group

The Chi-square of $X^2 = 9.24, \ p = .01, \ p < .05$ confirms the existence of significant statistical differences between the three groups but is inconclusive on which groups and to what extent they differ.
Field (2005) postulates a p (sig) value of less than .05 indicates a difference between the three groups. p = .01 thus p < .05. An existence of differences between the three groups was confirmed but not which groups and to what extent the differences occur.

Field (2005) advises that when specific hypotheses are tested (H1 hypotheses in the study at hand), a planned comparison of the three groups be conducted as a post hoc procedure. Since the Brown-Forsythe test was applied, the associated Dunnett T3 multiple comparisons test was applied.

The Dunnett T3 Multiple Comparisons Post Hoc Test reflects the group differences by comparing the mean scores of one group with the measures of the other two groups. All three groups were compared in terms of each other and the results are depicted in Table 4-25 below:

<table>
<thead>
<tr>
<th>(I) group</th>
<th>(J) group</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
</tr>
<tr>
<td>1 Miner</td>
<td>2 Shiftboss</td>
<td>-.10845</td>
<td>.07494</td>
<td>.388</td>
<td>-.2918</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>-.29463(*)</td>
<td>.07706</td>
<td>.001</td>
<td>-.4858</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>1 Miner</td>
<td>.10845</td>
<td>.07494</td>
<td>.388</td>
<td>-.0749</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>-.18618</td>
<td>.08180</td>
<td>.081</td>
<td>-.3895</td>
</tr>
<tr>
<td>3 Manager</td>
<td>1 Miner</td>
<td>.29463(*)</td>
<td>.07706</td>
<td>.001</td>
<td>.1035</td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>.18618</td>
<td>.08180</td>
<td>.081</td>
<td>-.0172</td>
</tr>
</tbody>
</table>

* The mean difference is significant at the .05 level.

The results depicted the following in terms of the three groups:
Manager - Shiftboss - $p = .081$, $p > 0.05$, Shiftboss – Miner - $p = .388$, $p > 0.05$, Manager - Miner – $p = 001$, $p < 0.05$. The Manager- Miner group showed significant statistical difference with regards to the overall safe mindset (SHMI).

It is evident from the empirical evidence (subsequent to the application of parametric as well as non parametric and ad hoc procedures) that there was statistically significant difference between Managers and Miners.

**Conclusion**

The empirical results with regards to Managers and Shiftbosses as well as Shiftbosses and Miners were inconclusive to reject the H01 hypothesis. The empirical evidence however for Managers and Miners indicate a significant statistical difference between Managers and Miners with regards to their safe human mindset index (SHMI) (or safety motivational intent).

With regards to hypothesis H01 it is concluded that:

- The null hypothesis that no statistically significant difference exists between Managers, Shiftbosses and Miners is not accepted as far as Managers and Miners were concerned.
- The alternative hypothesis, which should state that there is a statistically significant difference between the safe mindset of Managers and Miners, is accepted.
- Based on the empirical evidence, hypothesis H01 is therefore rejected.

Since the empirical evidence is inconclusive with regards to Managers and Shiftbosses as well as Shiftbosses and Miners, a second level of analysis of the main constructs of relationship credibility, climate and culture were undertaken, the results of which are described below.

**4.4.1.2 The second level of statistical analysis of the constructs relationship credibility, climate and culture**

The second level of analysis focused on the safe mindset of Managers, Shiftbosses and Miners with regards to the constructs relationship credibility, climate and culture.
Sub-hypothesis 1.1
There is no statistically significant difference between the Managers, Shiftbosses and Miners with regards to relationship credibility.

Rationale: Based on the fact that no evidence in the literature was found to support studies on relationship credibility of Managers, Shiftbosses and Miners, sub-hypothesis 1.1 is stated in a non-directional way.

In order to test sub hypothesis 1.1 the following statistical analysis procedures were applied with regards to relationship credibility.

- Reliability analysis
- Item total statistics
- One-way ANOVA descriptive statistics
- Levene's test of Equality of Error Variances (a)
- Anova F- ratio Test of Between Subject Effects
- Kruskal-Wallis Test Ranks and Test statistics (a, b) (non parametric test)
- Scheffé Multiple Comparisons Post Hoc Test

The reliability analysis results are depicted below in Table 4-26, which is also the case -processing summary for relationship credibility.

Table 4-26 Case processing Summary – Relationship credibility

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded (a)</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>

a Listwise deletion based on all variables in the procedure.

A total of 106 respondents were recorded with zero exclusion. The results of the reliability statistics are depicted in Table 4-27 below.
Table 4-27 Reliability statistics - Relationship credibility

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.884</td>
<td>36</td>
</tr>
</tbody>
</table>

The Cronbach Coefficient Alpha .884 indicates high reliability for relationship credibility. The item total statistics are depicted in Table 4-28 below:

Table 4-28 Item total statistics for Relationship Credibility

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>item1</td>
<td>98.93</td>
<td>196.348</td>
<td>.403</td>
<td>.881</td>
</tr>
<tr>
<td>item2</td>
<td>99.23</td>
<td>195.129</td>
<td>.428</td>
<td>.881</td>
</tr>
<tr>
<td>r.item6</td>
<td>99.90</td>
<td>194.380</td>
<td>.339</td>
<td>.882</td>
</tr>
<tr>
<td>item7</td>
<td>99.11</td>
<td>188.082</td>
<td>.603</td>
<td>.877</td>
</tr>
<tr>
<td>item9</td>
<td>99.15</td>
<td>196.015</td>
<td>.356</td>
<td>.882</td>
</tr>
<tr>
<td>r.item10</td>
<td>99.56</td>
<td>200.935</td>
<td>.127</td>
<td>.886</td>
</tr>
<tr>
<td>item16</td>
<td>99.47</td>
<td>190.671</td>
<td>.518</td>
<td>.879</td>
</tr>
<tr>
<td>item19</td>
<td>98.99</td>
<td>193.533</td>
<td>.565</td>
<td>.879</td>
</tr>
<tr>
<td>r.item20</td>
<td>99.71</td>
<td>190.628</td>
<td>.460</td>
<td>.880</td>
</tr>
<tr>
<td>item21</td>
<td>99.45</td>
<td>191.793</td>
<td>.478</td>
<td>.880</td>
</tr>
<tr>
<td>item22</td>
<td>99.23</td>
<td>190.386</td>
<td>.569</td>
<td>.878</td>
</tr>
<tr>
<td>item24</td>
<td>99.71</td>
<td>187.104</td>
<td>.658</td>
<td>.876</td>
</tr>
<tr>
<td>r.item25</td>
<td>99.42</td>
<td>191.883</td>
<td>.483</td>
<td>.879</td>
</tr>
<tr>
<td>r.item28</td>
<td>99.14</td>
<td>203.285</td>
<td>.038</td>
<td>.888</td>
</tr>
<tr>
<td>item30</td>
<td>99.37</td>
<td>192.654</td>
<td>.431</td>
<td>.880</td>
</tr>
<tr>
<td>item31</td>
<td>99.42</td>
<td>191.923</td>
<td>.526</td>
<td>.879</td>
</tr>
<tr>
<td>r.item34</td>
<td>99.64</td>
<td>199.394</td>
<td>.198</td>
<td>.885</td>
</tr>
<tr>
<td>item41</td>
<td>99.57</td>
<td>198.762</td>
<td>.233</td>
<td>.884</td>
</tr>
<tr>
<td>item42</td>
<td>99.70</td>
<td>187.222</td>
<td>.619</td>
<td>.876</td>
</tr>
<tr>
<td>r.item44</td>
<td>99.41</td>
<td>193.729</td>
<td>.340</td>
<td>.883</td>
</tr>
<tr>
<td>item45</td>
<td>99.51</td>
<td>190.405</td>
<td>.561</td>
<td>.878</td>
</tr>
<tr>
<td>r.item46</td>
<td>99.58</td>
<td>202.247</td>
<td>.081</td>
<td>.887</td>
</tr>
</tbody>
</table>
An ANOVA was conducted to establish empirically whether the three groups differed statistically significantly with regards to their mean scores.

The results are displayed in Table 4-29 below.

**Table 4-29  Descriptive statistics for the three leader groups and Relationship credibility**

<table>
<thead>
<tr>
<th>group</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miner</td>
<td>2.7475</td>
<td>.41252</td>
<td>60</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>2.8750</td>
<td>.36267</td>
<td>28</td>
</tr>
<tr>
<td>3 Manager</td>
<td>3.1209</td>
<td>.27736</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2.8446</td>
<td>.40077</td>
<td>106</td>
</tr>
</tbody>
</table>

Table 4-29 indicates a variance between the mean scores of the three groups subjected to the study.
In order to establish whether the variance was equal across the groups (one assumption of Anova) Levene's Test of Equality of Error Variances was applied and the results are illustrated in Table 4-30 below.

**Table 4-30 Levene's Test of Equality of Error Variances (a) – Relationship Credibility**

<table>
<thead>
<tr>
<th>Levene's Test of Equality of Error Variances (a)</th>
<th>Dependent Variable: relation mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>df1</td>
</tr>
<tr>
<td>3.021</td>
<td>2</td>
</tr>
</tbody>
</table>

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a Design: Intercept group

The result of $F (2,103) = 3.02, p = .053, p > .05$ is therefore insignificant. There is consequently homogeneity of variance across the three groups with regards to relationship credibility.

The results of the ANOVA F-ratio test of between subject effects for the three leader groups and relationship credibility are depicted in Table 4-31 below:

**Table 4-31 ANOVA F-ratio Comparison of Between Subject effects for the three leader groups and Relationship credibility**

<table>
<thead>
<tr>
<th>Tests of Between-Subjects Effects</th>
<th>Dependent Variable: relation mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>Type III Sum of Squares</td>
</tr>
<tr>
<td>Corrected Model</td>
<td>1.965(a)</td>
</tr>
<tr>
<td>Intercept</td>
<td>708.270</td>
</tr>
<tr>
<td>Group</td>
<td>1.965</td>
</tr>
<tr>
<td>Error</td>
<td>14.899</td>
</tr>
<tr>
<td>Total</td>
<td>874.600</td>
</tr>
<tr>
<td>Corrected Total</td>
<td>16.865</td>
</tr>
</tbody>
</table>
a R Squared = .117 (Adjusted R Squared = .099)

The result of the one way ANOVA, F (2,103) = 6.79, p = .002, p < .05, r = .34 indicates statistically significant difference between the mean scores of three groups but is inconclusive which groups and to what extent they differ. The result of r = .34 indicates a medium effect size.

The Kruskal-Wallis test is the non-parametric version of the one-way ANOVA. The Kruskal-Wallis test was applied (not only as an alternative to ANOVA) but as a result of the sample sizes. The results of the Kruskal-Wallis test ranks and test statistics (a, b) are depicted in Tables 4-32 and 4-33 below:

Table 4-32 Kruskal-Wallis Test Ranks- Relationship Credibility

<table>
<thead>
<tr>
<th>Relation mean</th>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>46.13</td>
<td></td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>28</td>
<td>55.16</td>
<td></td>
</tr>
<tr>
<td>3 Manager</td>
<td>18</td>
<td>75.47</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results drawn in Table 4-33 indicate a difference between the three groups pertaining to their ranked scores.

Table 4-33 Kruskal–Wallis Test statistics (a, b)

<table>
<thead>
<tr>
<th>Test statistics (a, b) Relationship Credibility</th>
<th>Relation. mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>12.734</td>
</tr>
<tr>
<td>df</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.002</td>
</tr>
</tbody>
</table>

a Kruskal Wallis Test
b Grouping Variable: group
The Chi-square ($x^2$) = 12.7, p= .002, p < .05 confirms a difference between the three groups, but is inconclusive as to which groups differed and to what extent the differences occurred.

The Scheffé Multiple Comparisons Post Hoc Test was applied to establish the differences between groups and the results are portrayed in Table 4-34 below.

**Table 4- 34 Scheffé Multiple Comparisons Post Hoc Test – Relationship Credibility**

<table>
<thead>
<tr>
<th>Multiple Comparisons</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Scheffe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Miner</td>
<td>2 Shiftboss</td>
<td>-.1275</td>
<td>.08705</td>
<td>.346</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>-.3734(*)</td>
<td>.10221</td>
<td>.002</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>1 Miner</td>
<td>.1275</td>
<td>.08705</td>
<td>.346</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>-.2459</td>
<td>.11490</td>
<td>.106</td>
</tr>
<tr>
<td>3 Manager</td>
<td>1 Miner</td>
<td>.3734(*)</td>
<td>.10221</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>.2459</td>
<td>.11490</td>
<td>.106</td>
</tr>
</tbody>
</table>

The result of the Scheffé Multiple Comparisons Post Hoc Test depict that Manager-Shiftboss – p = .106, p > .05, Shiftboss – Miner - p = .346, p > .05, Manager- Miner- p = .002, p < .05. Since p < .05, the Manager - Miner group differed statistically significantly with regards to relationship credibility.

**Conclusion**

The Manager – Miner group was the only group that differed statistically significantly with regards to relationship credibility.

With regards to sub-hypothesis 1.1 it is concluded that:
• The null hypothesis of no statistically significant difference between Managers, Shiftbosses and Miners exist with regards to relationship credibility is not accepted with regards to Managers and Miners.
• The alternative hypothesis, which should state that a statistically significant difference between the relationship credibility of Managers-Miners exists, is accepted.
• Based on the empirical evidence, sub-hypothesis 1.1 is therefore rejected.

**Sub-hypothesis 1.2**

There is no statistically significant difference between the Managers, Shiftbosses and Miners with regards to climate.

**Rationale:** Based on the fact that no evidence in the literature was found to support the relationship between climate and Managers, Shiftbosses and Miners, sub-hypothesis 1.2 is stated in a non-directional way.

In order to test sub-hypothesis 1.2 the following statistical analyses procedures were applied with regards to climate.

• Reliability analysis
• One-way ANOVA descriptive statistics
• Levene's test of Equality of Error Variances
• Brown-Forsythe Robust Test of Equality of Means
• Kruskal-Wallis Test Ranks and Test statistics
• Dunnett T3 Multiple comparisons Post Hoc Test

The statistical results of the construct Climate are discussed next.

The results of the reliability analysis are depicted below in Table 4-35 as the case-processing summary for climate.

**Table 4-35 Case processing Summary – Climate**

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>
a Listwise deletion based on all variables in the procedure.

All 106 respondents could be processed with zero exclusion. The results of the reliability statistics for climate are depicted in Table 4-36 below.

**Table 4-36 Reliability statistics – Climate**

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach’s Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.864</td>
<td>25</td>
</tr>
</tbody>
</table>

The Cronbach Coefficient Alpha of .864 indicates high reliability for climate.

The item total statistics are portrayed in Table 4-37 below.

**Table 4-37 Item total statistics – climate**

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>item1</td>
<td>70.28</td>
<td>111.538</td>
<td>.453</td>
<td>.858</td>
</tr>
<tr>
<td>item2</td>
<td>70.58</td>
<td>110.056</td>
<td>.509</td>
<td>.856</td>
</tr>
<tr>
<td>r.item3</td>
<td>70.42</td>
<td>115.942</td>
<td>.101</td>
<td>.869</td>
</tr>
<tr>
<td>item4</td>
<td>70.79</td>
<td>113.099</td>
<td>.316</td>
<td>.861</td>
</tr>
<tr>
<td>r.item5</td>
<td>70.90</td>
<td>113.408</td>
<td>.239</td>
<td>.864</td>
</tr>
<tr>
<td>r.item6</td>
<td>71.25</td>
<td>109.596</td>
<td>.391</td>
<td>.860</td>
</tr>
<tr>
<td>item7</td>
<td>70.46</td>
<td>104.918</td>
<td>.661</td>
<td>.850</td>
</tr>
<tr>
<td>r.item8</td>
<td>71.10</td>
<td>110.456</td>
<td>.379</td>
<td>.860</td>
</tr>
<tr>
<td>item9</td>
<td>70.50</td>
<td>110.614</td>
<td>.435</td>
<td>.858</td>
</tr>
<tr>
<td>r.item10</td>
<td>70.91</td>
<td>116.105</td>
<td>.105</td>
<td>.868</td>
</tr>
<tr>
<td>item11</td>
<td>70.36</td>
<td>114.289</td>
<td>.225</td>
<td>.864</td>
</tr>
<tr>
<td>r.item12</td>
<td>70.24</td>
<td>113.687</td>
<td>.279</td>
<td>.863</td>
</tr>
<tr>
<td>item13</td>
<td>70.91</td>
<td>113.096</td>
<td>.307</td>
<td>.862</td>
</tr>
<tr>
<td>item14</td>
<td>70.44</td>
<td>108.325</td>
<td>.570</td>
<td>.854</td>
</tr>
<tr>
<td>item15</td>
<td>70.60</td>
<td>110.299</td>
<td>.525</td>
<td>.856</td>
</tr>
<tr>
<td>item16</td>
<td>70.82</td>
<td>107.977</td>
<td>.517</td>
<td>.855</td>
</tr>
</tbody>
</table>
An ANOVA was conducted to establish empirically whether the three groups did not differ statistically significantly with regards to climate.

The results are depicted in Table 4-38 below:

Table 4-38 Descriptive statistics for the three leader groups and Climate

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miner</td>
<td>2.8193</td>
<td>.47924</td>
<td>60</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>3.0257</td>
<td>.31141</td>
<td>28</td>
</tr>
<tr>
<td>3 Manager</td>
<td>3.2444</td>
<td>.25405</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>2.9460</td>
<td>.43654</td>
<td>106</td>
</tr>
</tbody>
</table>

The results of Table 4-38 depicted a variance between the mean scores of the three groups subjected to the study.

In order to establish whether the variance was equal across the three groups (an assumption of ANOVA) Levene's Test of Equality of Error Variance (a) was applied and the results are noted in Table 4-39 below:

Table 4-39 Levene's Test of Equality of Error Variance (a) – Climate

<table>
<thead>
<tr>
<th>Levene's Test of Equality of Error Variances (a)</th>
<th>Dependent Variable: climate mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>df1</td>
</tr>
<tr>
<td>7.272</td>
<td>2</td>
</tr>
</tbody>
</table>

Tests the null hypothesis that the error variance of the dependent
variable is equal across groups.

a Design: Intercept group

The result of Levene’s test is $F(2,103) = 7.27, p= .001$, $p< .05$ indicated heterogeneity of variance (a violation of homogeneity of variance) and steps to correct this were taken. The Brown - Forsythe Robust Test of Equality of Means was applied and the results are shown in Table 4-40 below:

<table>
<thead>
<tr>
<th>Robust Tests of Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistic (a)</td>
</tr>
<tr>
<td>Brown-Forsythe</td>
</tr>
</tbody>
</table>

a Asymptotically $F$ distributed.

The result of $F(2,96) = 12.22, p= .000$, $p < .001$, $p < .05$ indicates that the result was not due to chance.

The Kruskal-Wallis test was applied as a non - parametric alternative test to the One-way ANOVA to confirm variances within groups, the results of which are displayed in Tables 4-41 and 4-42 below.

<table>
<thead>
<tr>
<th>Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>Climate.mean</td>
</tr>
<tr>
<td>2 Shiftboss</td>
</tr>
<tr>
<td>3 Manager</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistics (a,b) Climate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate mean</td>
</tr>
<tr>
<td>Chi-Square</td>
</tr>
</tbody>
</table>
The Chi-square ($x^2$) = 13.72, p = .001, p < 0.05 confirmed a difference between the three groups, but it was inconclusive as to which groups differed and to what extent.

In order to establish the within group variances, the Dunnett T3 Multi Comparisons Post Hoc Test was applied.

The results are depicted in Table 4-43 below:

### Table 4-43 Dunnett T3 Multiple Comparisons Post Hoc Test - Climate

<table>
<thead>
<tr>
<th>(I) Group</th>
<th>(J) Group</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 Miner</td>
<td>Shiftboss</td>
<td>-.2064</td>
<td>.08539</td>
<td>.053</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>-.4251(*)</td>
<td>.08610</td>
<td>.000</td>
<td>-.6369</td>
</tr>
<tr>
<td>1 Miner</td>
<td>Shiftboss</td>
<td>-.2187(*)</td>
<td>.08396</td>
<td>.037</td>
<td>-.4273</td>
</tr>
<tr>
<td></td>
<td>Manager</td>
<td>.4251(*)</td>
<td>.08610</td>
<td>.000</td>
<td>.2133</td>
</tr>
<tr>
<td>2 Manager</td>
<td>Shiftboss</td>
<td>.2187(*)</td>
<td>.08396</td>
<td>.037</td>
<td>.0102</td>
</tr>
</tbody>
</table>

Based on observed means.

* The mean difference is significant at the .05 level.

The results for Manager - Shiftboss – p = .037, p < .05, Shiftboss - Miner – p = .053, p > .05, Manager – Miner – p = .000, p < .05 indicate statistically significant variance within the Manager – Shiftboss and Manager – Miner groups with regards to Climate.

**Conclusion**
The Manager – Shiftboss and Manager – Miner groups differed statistically significantly with regards to Climate.

With regards to sub-hypothesis 1.2 it is concluded that:

- The null hypothesis that no statistically significant differences exist between Managers, Shiftbosses and Miners with regards to climate is not accepted as far as Managers – Shiftbosses and Managers - Miners were concerned.
- The alternative hypothesis, which should state that there is a statistically significant difference between Managers – Shiftbosses and Managers-Miners with regards to climate is accepted.
- Based on the empirical evidence, sub-hypothesis 1.2 is therefore rejected.

**Sub-hypothesis 1.3**

There is no statistically significant difference between Managers, Shiftbosses and Miners with regards to culture.

**Rationale:** Based on the fact that no evidence in the literature was found to support the differences between Managers, Shiftbosses and Miners with regards to culture, sub-hypothesis 1.3 is stated in a non directional way.

In order to test sub-hypothesis 1.3 the following statistical analyses procedures were applied with regards to culture.

- Reliability analysis
- One-way ANOVA descriptive statistics
- Levene's test of Equality of Error Variances
- Brown-Forsythe Robust Test of Equality of Means
- Kruskal-Wallis Test Ranks and Test statistics
- Dunnett T3 Multiple Comparisons Post Hoc Test

The reliability analysis is depicted below:
Table 4-44  Case processing summary - Culture

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded(a)</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>

All 106 respondents were processed with zero exclusion. The results of the reliability analysis are shown in Table 4-45 below:

Table 4-45  Reliability statistics – Culture

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>.696</td>
<td>19</td>
</tr>
</tbody>
</table>

The Cronbach Coefficient Alpha of .696 was .004 below < .7 (which is the threshold for Cronbach Coefficient Alpha) but is however considered for statistical analysis purposes.

The item total statistics are sketched in Table 4-46 below:

Table 4-46  Item total statistics - Culture

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>item26</td>
<td>51.53</td>
<td>42.328</td>
<td>.172</td>
<td>.695</td>
</tr>
<tr>
<td>item27</td>
<td>52.10</td>
<td>42.018</td>
<td>.215</td>
<td>.690</td>
</tr>
<tr>
<td>r.item28</td>
<td>51.65</td>
<td>43.163</td>
<td>.091</td>
<td>.703</td>
</tr>
<tr>
<td>item29</td>
<td>51.55</td>
<td>39.012</td>
<td>.526</td>
<td>.660</td>
</tr>
<tr>
<td>item30</td>
<td>51.88</td>
<td>38.813</td>
<td>.448</td>
<td>.665</td>
</tr>
<tr>
<td>item31</td>
<td>51.93</td>
<td>39.148</td>
<td>.491</td>
<td>.663</td>
</tr>
<tr>
<td>r.item32</td>
<td>51.91</td>
<td>39.896</td>
<td>.419</td>
<td>.670</td>
</tr>
<tr>
<td>item33</td>
<td>51.16</td>
<td>42.117</td>
<td>.279</td>
<td>.685</td>
</tr>
</tbody>
</table>
An ANOVA was conducted to establish empirically whether the three groups did not differ statistically with regards to Culture.

The results are delineated in Table 4-47 below:

### Table 4-47 Descriptive statistics for the three leader groups and Culture

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miner</td>
<td>2.8404</td>
<td>.38199</td>
<td>60</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>2.9004</td>
<td>.28875</td>
<td>28</td>
</tr>
<tr>
<td>3 Manager</td>
<td>3.0088</td>
<td>.33201</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>2.8848</td>
<td>.35371</td>
<td>106</td>
</tr>
</tbody>
</table>

The results of Table 4-47 depict a variance between the mean scores of the three groups subjected to the study.

Levene’s test of Equality of Error Variances tests whether the variance is equal across groups. The results are portrayed in Table 4-48 below:
Table 4-48 Levene’s test of Equality of Error Variances (a) – Culture

<table>
<thead>
<tr>
<th>Levene’s Test of Equality of Error Variances(a)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: culture.mean</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>df1</td>
</tr>
<tr>
<td>1.676</td>
<td>2</td>
</tr>
</tbody>
</table>

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a Design: Intercept group

The result of F (2,103) = 1.68, p = .192, p > .05 indicate variance is equal across groups and no violation of homogeneity of variance occurred.

The results of the ANOVA F- ratio test of between subject effects for the three leader groups and culture are reproduced in Table 4-49 below:

Table 4-49 ANOVA F- ratio Comparison of Between Subject Effects for the three leader groups and Culture

<table>
<thead>
<tr>
<th>Tests of Between-Subjects Effects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: culture mean</td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Type III Sum of Squares</td>
</tr>
<tr>
<td>Corrected Model</td>
<td>.402(a)</td>
</tr>
<tr>
<td>Intercept</td>
<td>709.248</td>
</tr>
<tr>
<td>Group</td>
<td>.402</td>
</tr>
<tr>
<td>Error</td>
<td>12.734</td>
</tr>
<tr>
<td>Total</td>
<td>895.280</td>
</tr>
<tr>
<td>Corrected Total</td>
<td>13.136</td>
</tr>
</tbody>
</table>

The result of the One–way ANOVA, F (2,103) = 1.63, p = .202, p > .05, r = .18 indicates an insignificant difference between the mean scores of three groups with a small effect size.

The Kruskal-Wallis test is a non-parametric equivalent to one-way ANOVA. The results of the Kruskal-Wallis are displayed in Table 4-50 below.
The test statistics for Kruskal-Wallis are depicted in Table 4-51 below.

Table 4-50  Kruskal-Wallis Test Ranks -Culture

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture mean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>49.79</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>28</td>
<td>53.77</td>
</tr>
<tr>
<td>3 Manager</td>
<td>18</td>
<td>65.44</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td></td>
</tr>
</tbody>
</table>

The Chi-square $x^2 = 3.6$, $p = .165$, $p > .05$ confirmed that no statistical difference existed between the three groups with regards to culture.

The result of the Scheffé Multiple Comparisons Post Hoc Test is listed in Table 4-52 below:

Table 4-51  Kruskal-Wallis Test Statistics (a, b) – Culture

<table>
<thead>
<tr>
<th>Test statistics (a,b) Culture</th>
<th>culture.mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>3.604</td>
</tr>
<tr>
<td>df</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.165</td>
</tr>
</tbody>
</table>

a Kruskal Wallis Test
b Grouping Variable: group

Table 4-52  Scheffé Multiple Comparisons Post Hoc Test - Culture

<table>
<thead>
<tr>
<th>Multiple Comparisons</th>
<th>(I) Group</th>
<th>(J) Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Difference (I-J)</td>
<td>Std. Error</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
</tr>
<tr>
<td>Scheffé</td>
<td>1 Miner</td>
<td>2 Shiftboss</td>
</tr>
</tbody>
</table>
The results between Manager – Shiftboss, p = .596, p > .05, Shiftboss – Miner, p = .758, p > .05 and Manager - Miner, p = .209, p > .05 indicate no statistically significant differences existed between the three leader groups with regards to culture.

Conclusion

No statistically significant difference existed amongst the three groups with regards to culture.

With regards to sub-hypothesis 1.3 it is concluded that:

- The null hypothesis of no significant statistical difference between Managers, Shiftbosses and Miners with regards to culture is not rejected.
- The alternative hypothesis, which should state that there is a statistically significant difference between Managers, Shiftbosses and Miners with regards to culture, is not accepted.
- Sub-hypothesis 1.3 is therefore supported by empirical evidence.

The second level statistical analysis procedures for the constructs relationship credibility, climate and culture are complete.

The third level of statistical analysis of the sub - constructs underlying relationship credibility, climate and culture are discussed next.

4.4.1.3 Third level of statistical analysis

The third level of statistical analysis focused on the sub - constructs trust, caring support, ownership, the physical environment and safety intent.
Only sub-constructs with Cronbach-Alpha Coefficients >.7 are depicted with the exception of Trust (Cronbach-Alpha .691) that was close to 0.7.

The sub-constructs respect (relationship credibility), and sub-constructs attitude towards the job and attitude towards the company for climate are excluded as a result of Cronbach Coefficient Alpha values < 0.7.

The reason for Cronbach Alpha values < 0.7 was related to sample size, hence the application of non-parametric tests (Kruskal-Wallis).

The rationale for statistical analysis of sub-constructs with Cronbach - Alpha values >.7 are as a result of the statistical analysis conducted on the first level (SHMI results) and the second level (constructs of relationship credibility, climate and culture).

Although statistically significant differences existed amongst the three groups (Managers, Miners and Shiftbosses) with regards to relationship credibility and climate, no statistically significant differences existed where culture was concerned.

The objective of this study was to establish the safe mindset of the three production leader levels (groups) and physical environment and safety intent are sub-constructs of climate. The significance of statistical analysis of sub-constructs lay in the potential practical value of statistical differences within the groups. The statistical analyses results of the sub-constructs are discussed next.

Sub-hypothesis 1.4
There is no statistically significant difference between Managers, Shiftbosses and Miners with regards to trust.

Rationale: Based on the fact that no evidence in the literature was found to support the differences between Managers, Shiftbosses and Miners with regards to trust, sub-hypothesis 1.4 is stated in a non-directional way.
In order to test sub-hypothesis 1.4, the following statistical procedures were applied with regards to trust:

- Reliability analysis
- Item total statistics
- One-way ANOVA descriptive statistics
- Levene's test of Equality of Error Variances
- ANOVA – F-ratio comparison of between subject effects
- Kruskal-Wallis non parametric Test Ranks and Test statistics
- Scheffé Multiple Comparisons Post Hoc test

The statistical results of the reliability analysis are noted below:

Table 4-53 depicts the case - processing summary for trust.

Table 4- 53 Case processing Summary

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded (a)</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>

A Listwise deletion based on all variables in the procedure.

All 106 respondents were utilised for statistical analysis purposes with zero exclusion. The reliability statistics for trust is drawn in Table 4-54 below:

Table 4- 54 Reliability statistics - Trust

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>14</td>
</tr>
<tr>
<td>.691</td>
<td></td>
</tr>
</tbody>
</table>

Although the Cronbach-Coefficient Alpha value of .691 is < .7 it is close to 0.7 for consideration.

Table 4-55 depicts the item total statistics for trust if the item was deleted.
The reliability statistics for trust is complete.

A one-way ANOVA was conducted to establish within group variances with regards to mean scores in respect of trust. The results of the one-way ANOVA are portrayed in Table 4-56 below:

Table 4- 55  Item Total Statistics

<table>
<thead>
<tr>
<th>Item</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach’s Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>r.item6</td>
<td>36.48</td>
<td>27.147</td>
<td>.314</td>
<td>.674</td>
</tr>
<tr>
<td>r.item10</td>
<td>36.14</td>
<td>29.761</td>
<td>.093</td>
<td>.703</td>
</tr>
<tr>
<td>item16</td>
<td>36.06</td>
<td>26.282</td>
<td>.451</td>
<td>.654</td>
</tr>
<tr>
<td>item21</td>
<td>36.04</td>
<td>27.199</td>
<td>.355</td>
<td>.668</td>
</tr>
<tr>
<td>r.item28</td>
<td>35.73</td>
<td>31.134</td>
<td>-.041</td>
<td>.720</td>
</tr>
<tr>
<td>item31</td>
<td>36.01</td>
<td>26.352</td>
<td>.510</td>
<td>.648</td>
</tr>
<tr>
<td>item41</td>
<td>36.15</td>
<td>28.529</td>
<td>.230</td>
<td>.682</td>
</tr>
<tr>
<td>item45</td>
<td>36.09</td>
<td>26.734</td>
<td>.433</td>
<td>.657</td>
</tr>
<tr>
<td>item48</td>
<td>36.12</td>
<td>27.442</td>
<td>.419</td>
<td>.662</td>
</tr>
<tr>
<td>r.item50</td>
<td>36.07</td>
<td>27.453</td>
<td>.322</td>
<td>.672</td>
</tr>
<tr>
<td>r.item52</td>
<td>36.10</td>
<td>28.246</td>
<td>.315</td>
<td>.674</td>
</tr>
<tr>
<td>r.item54</td>
<td>35.96</td>
<td>27.484</td>
<td>.396</td>
<td>.664</td>
</tr>
<tr>
<td>r.item56</td>
<td>36.30</td>
<td>28.841</td>
<td>.208</td>
<td>.687</td>
</tr>
<tr>
<td>item58</td>
<td>36.27</td>
<td>27.763</td>
<td>.336</td>
<td>.671</td>
</tr>
</tbody>
</table>

Table 4- 56  Descriptive statistics for the three leader groups and Trust

<table>
<thead>
<tr>
<th>Descriptives</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Trust.mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
</tr>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>2.7250</td>
<td>.41667</td>
<td>.05379</td>
<td>2.6174</td>
<td>2.8326</td>
<td>1.86</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>28</td>
<td>2.7296</td>
<td>.38752</td>
<td>.07323</td>
<td>2.5793</td>
<td>2.8799</td>
<td>2.07</td>
</tr>
<tr>
<td>3 Manager</td>
<td>18</td>
<td>3.0278</td>
<td>.27297</td>
<td>.06434</td>
<td>2.8920</td>
<td>3.1635</td>
<td>2.50</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>2.7776</td>
<td>.40145</td>
<td>.03899</td>
<td>2.7003</td>
<td>2.8549</td>
<td>1.86</td>
</tr>
</tbody>
</table>
The result indicates variances within the three groups with regards to trust, albeit between Shiftboss – Miner group the variance was small.

Levene’s Test of homogeneity of variance was applied to test the ANOVA assumption of homogeneity of variance amongst the three groups. The result is depicted in Table 4-57 below:

**Table 4- 57  Levene's Test of Equality of Error Variances (a)- Trust**

<table>
<thead>
<tr>
<th>Test of Homogeneity of Variances</th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust.mean</td>
<td>2.200</td>
<td>2</td>
<td>103</td>
<td>.116</td>
</tr>
</tbody>
</table>

The result $F (2,103) = 2.20, p = .116, p >.05$ indicated homogeneity of variance within the three groups.

The result of the ANOVA - F- ratio comparison of between subject effects is displayed in Table 4-58 below:

**Table 4-58  ANOVA – F- ratio Comparison of Between Subject Effects of the three leaders groups and Trust**

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between Groups</td>
<td>1.357</td>
<td>2</td>
<td>.679</td>
<td>4.491</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>15.565</td>
<td>103</td>
<td>.151</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>16.922</td>
<td>105</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The result of $F (2,103) = 4.50, p = .013, p < .05$ indicated that the result was not due to chance.

The Kruskal-Wallis non-parametric test was applied to confirm within group variances.

The Kruskal-Wallis non - parametric test Rank and Test statistic is depicted in Tables 4 – 59 and 4-60 below.
The Kruskal-Wallis test statistics (a, b) with regards to trust is shown in Table 4-60 below:

**Table 4- 60  Kruskal-Wallis Test statistics (a, b)**

<table>
<thead>
<tr>
<th>Test Statistics (a, b)</th>
<th>Trust mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>9.498</td>
</tr>
<tr>
<td>df</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.009</td>
</tr>
</tbody>
</table>

a Kruskal Wallis Test
b Grouping Variable: group

The Chi-square result: $x^2 (2) = 9.50$, $p = .009$, $p < .05$ confirms the within groups variance but is inconclusive as to which groups and to what extent the variance exists.

The Scheffé multiple comparisons post hoc test was applied to determine within group variances with regards to trust and the results are depicted in Table 4-61 below:
Table 4-61 Scheffé Multiple Comparisons Post Hoc Test - Trust

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(I) group</th>
<th>(J) group</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Trust.mean</td>
<td>1 Miner</td>
<td>2 Shiftboss</td>
<td>-.00459</td>
<td>.08897</td>
<td>.999</td>
<td>-.2256</td>
</tr>
<tr>
<td></td>
<td>1 Miner</td>
<td>3 Manager</td>
<td>-.30278(*)</td>
<td>.10447</td>
<td>.018</td>
<td>-.5623</td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>1 Miner</td>
<td>.00459</td>
<td>.08897</td>
<td>.999</td>
<td>-.2164</td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>3 Manager</td>
<td>-.29819(*)</td>
<td>.11744</td>
<td>.044</td>
<td>-.5899</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>1 Miner</td>
<td>.30278(*)</td>
<td>.10447</td>
<td>.018</td>
<td>.0433</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>2 Shiftboss</td>
<td>.29819(*)</td>
<td>.11744</td>
<td>.044</td>
<td>.0065</td>
</tr>
</tbody>
</table>

* The mean difference is significant at the .05 level.

The results of Manager – Shiftboss, p= 0.44, p < .05, Shiftboss - Miner, p = .999, p >.05 Manager – Miner, p= .018, p < .05 indicated Manager – Shiftboss and Manager – Miner groups differed statistically significantly with regards to Trust.

Conclusion

The Manager- Shiftboss and Manager- Miner groups differed statistically significantly with regards to Trust.

With regards to sub-hypothesis 1.4 it is concluded that:

- The null hypothesis that no statistical significant difference exist between Managers, Shiftbosses and Miners with regards to trust, is not accepted.
- The alternative hypothesis, which should state that a statistical significant difference exists between the Manager- Shiftboss and Manager –Miner is accepted.
- Based on the empirical evidence sub-hypothesis 1.4 is therefore rejected.

Sub-hypothesis 1.5

There is no statistically significant difference between Managers, Shiftbosses and Miners with regards to caring support.
**Rationale:** Based on the fact that no evidence in the literature was found to support differences between Managers, Shiftbosses and Miners with regards to caring support, sub-hypothesis 1.5 are stated in a non-directional way.

In order to test sub-hypothesis 1.5, the following statistical procedures were applied with regards to trust:

- Reliability analysis
- Item total statistic
- One-way ANOVA descriptive statistics
- Levene's test of Equality of Error Variances
- ANOVA – F-ratio comparison of between subject effects
- Kruskal-Wallis non parametric Test Ranks and Test statistics
- Scheffé Multiple Comparisons Post Hoc Test

The statistical results of the reliability analysis are discussed next.

The case - processing summary is depicted in Table 4-62 below:

**Table 4-62 Case processing Summary – Caring Support**

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded(a)</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>

a Listwise deletion based on all variables in the procedure.

All 106 respondents were utilised for statistical analysis purposes with zero exclusions.

The reliability statistics for caring support is presented in Table 4-63:
Table 4-63 Reliability statistics – Caring Support

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s Alpha</td>
</tr>
<tr>
<td>.804</td>
</tr>
</tbody>
</table>

The Cronbach Coefficient Alpha value of .804 indicates high reliability.

The item total statistics are listed in Table 4-64 below if the item were deleted:

Table 4-64 Item total statistics - Caring support

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale Mean if Item Deleted</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td>r.item6</td>
</tr>
<tr>
<td>item9</td>
</tr>
<tr>
<td>item19</td>
</tr>
<tr>
<td>r.item20</td>
</tr>
<tr>
<td>item22</td>
</tr>
<tr>
<td>r.item25</td>
</tr>
<tr>
<td>item30</td>
</tr>
<tr>
<td>item42</td>
</tr>
<tr>
<td>item45</td>
</tr>
<tr>
<td>r.item46</td>
</tr>
<tr>
<td>item48</td>
</tr>
<tr>
<td>r.item50</td>
</tr>
<tr>
<td>r.item52</td>
</tr>
<tr>
<td>item53</td>
</tr>
<tr>
<td>r.item54</td>
</tr>
<tr>
<td>item55</td>
</tr>
</tbody>
</table>

The reliability statistics for caring support is complete.

A one-way ANOVA was conducted to establish within group variances with regards to mean scores in respect of Caring Support. The results of the one-way ANOVA descriptive statistics are illustrated in Table 4-65 below:
Table 4-65 Descriptive statistics for the three leader groups and Caring Support

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Miner</td>
<td>60</td>
<td>2.7365</td>
<td>.47808</td>
<td>2.6130</td>
<td>2.8600</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Shiftboss</td>
<td>28</td>
<td>2.8348</td>
<td>.40441</td>
<td>2.6780</td>
<td>2.9916</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Manager</td>
<td>18</td>
<td>3.1181</td>
<td>.30685</td>
<td>2.9655</td>
<td>3.2706</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>106</td>
<td>2.8272</td>
<td>.45272</td>
<td>2.7401</td>
<td>2.9144</td>
</tr>
</tbody>
</table>

The result indicates variances within the three groups with regards to Caring Support.

Levene’s Test of Equality of Error Variances was applied to test the ANOVA assumption of homogeneity of variance amongst the three groups. The result is depicted in Table 4-66 below:

Table 4-66 Levene’s Test of Equality of Error Variances (a)- Caring Support

<table>
<thead>
<tr>
<th></th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care.mean</td>
<td>2.708</td>
<td>2</td>
<td>103</td>
<td>.071</td>
</tr>
</tbody>
</table>

The result $F (2,103) = 2.71$, $p = .071$, $p >.05$ indicated homogeneity of variance within the three groups.

The result of the One - way ANOVA is drawn in Table 4-67 below:

Table 4-67 ANOVA - F – ratio Comparison of Between Subject Effects of the three leader groups and Caring Support

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care.mean Between Groups</td>
<td>2.018</td>
<td>2</td>
<td>1.009</td>
<td>5.330</td>
<td>.006</td>
</tr>
</tbody>
</table>
The result of $F(2, 103) = 5.33$, $p = .006$, $p < .05$ indicated that the result was not due to chance.

The Kruskal-Wallis Test Ranks and Test statistics (a,b) was applied to confirm within group variances and the results are noted in Tables 4-68 and 4-69 below.

**Table 4-68 Kruskal-Wallis Test Ranks**

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>47.49</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>28</td>
<td>53.32</td>
</tr>
<tr>
<td>3 Manager</td>
<td>18</td>
<td>73.81</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4-69 Kruskal-Wallis Test Statistics (a, b)**

<table>
<thead>
<tr>
<th>Test Statistics (a, b)</th>
<th>Care.mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>10.168</td>
</tr>
<tr>
<td>df</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.006</td>
</tr>
</tbody>
</table>

The Chi-square result: $x^2(2) = 10.168$, $p = .006$, $p < .05$ confirms the within group variances but is inconclusive as to which groups and to what extent.

The results of the Scheffé Multiple Comparisons Post Hoc Test were applied to determine within group variances with regards to Caring Support, the results of which are depicted in Table 4-70 below:
Table 4- 70 Scheffé Multiple Comparisons Post Hoc Test Caring Support

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(I) group</th>
<th>(J) group</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care. mean Scheffé</td>
<td>1 Miner</td>
<td>2 Shiftboss</td>
<td>-.09836</td>
<td>.09959</td>
<td>.615</td>
<td>-.3457 .1490</td>
</tr>
<tr>
<td></td>
<td>1 Miner</td>
<td>3 Manager</td>
<td>-.38160(*)</td>
<td>.11694</td>
<td>.006</td>
<td>-.6720 -.0912</td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>1 Miner</td>
<td>.09836</td>
<td>.09959</td>
<td>.615</td>
<td>-.1490 .3457</td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>3 Manager</td>
<td>-.28323</td>
<td>.13146</td>
<td>.103</td>
<td>-.6097 .0433</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>1 Miner</td>
<td>.38160(*)</td>
<td>.11694</td>
<td>.006</td>
<td>-.0912 .6720</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>2 Shiftboss</td>
<td>.28323</td>
<td>.13146</td>
<td>.103</td>
<td>-.0433 .6097</td>
</tr>
</tbody>
</table>

* The mean difference is significant at the .05 level.

The results of Manager – Miner, p = .006, p < .05, indicated statistically significant differences with regards to caring support. The results of Manager – Shiftboss, p = .103, p >.05 and Shiftboss - Miner, p = .615, p >.05 indicated no significant statistical difference with regards to Caring Support.

Conclusion
The Manager – Miner group differed statistically significantly with regards to Caring Support.

With regards to sub-hypothesis 1.5 it is concluded that:
- The null hypothesis that no statistically significant difference exists between Managers, Shiftbosses and Miners with regards to Caring Support is not accepted.
- The alternative hypothesis, which should state that a statistical significant difference exists between Managers and Miners with regards to Caring Support is accepted.
- Based on the empirical evidence, sub-hypothesis 1.5 is therefore rejected.
Sub-hypothesis 1.6
There is no statistically significant difference between Managers, Shiftbosses and Miners with regards to ownership.

Rationale: Based on the fact that no evidence in the literature was found to support differences between Managers, Shiftbosses and Miners with regards to ownership, sub-hypothesis 1.6 is stated in a non-directional way.

In order to test sub-hypothesis 1.6, the following statistical procedures were applied with regards to ownership:
- Reliability analysis
- Item total statistic
- One-way ANOVA descriptive statistics
- Levene’s test of Equality of Equality of Error Variances (a)
- ANOVA – F-ratio comparison of between subject effects
- Kruskal-Wallis Test Ranks and Test statistics (a, b) (non parametric test)
- ANOVA F-ratio comparison of between subject effects
- Scheffé Multiple Comparisons Post Hoc Test

The statistical results of the reliability analysis are discussed next.
The case - processing summary for Ownership is depicted in Table 4-71 below:

Table 4- 71 Case processing Summary

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded(a)</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>

a Listwise deletion based on all variables in the procedure.

All 106 respondents were utilised for statistical analysis purposes with zero exclusions.
The reliability statistics for Ownership are shown in Table 4-72 below:

Table 4- 72  Reliability statistics

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
</tr>
<tr>
<td>.776</td>
</tr>
</tbody>
</table>

The Cronbach Coefficient Alpha value of .776 indicates high reliability.

The item total statistics for Ownership if the item were deleted are listed in Table 4-73 below:

Table 4-73  Item total statistics – Ownership

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale Mean if Item Deleted</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>item1</td>
</tr>
<tr>
<td>item2</td>
</tr>
<tr>
<td>item7</td>
</tr>
<tr>
<td>r.item44</td>
</tr>
<tr>
<td>item45</td>
</tr>
<tr>
<td>item47</td>
</tr>
<tr>
<td>r.item50</td>
</tr>
<tr>
<td>item51</td>
</tr>
<tr>
<td>item53</td>
</tr>
<tr>
<td>r.item54</td>
</tr>
<tr>
<td>item60</td>
</tr>
</tbody>
</table>

The reliability statistics for ownership is complete.

A one-way ANOVA was conducted to establish within group variances with regards to mean scores in respect of ownership. The results of the one-way ANOVA descriptive statistics are depicted in Table 4-74 below:
Table 4-74  Descriptive statistics for the three leader groups and Ownership

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Owner.mean</td>
<td>1 Miner</td>
<td>60</td>
<td>2.7985</td>
<td>.50991</td>
<td>.06583</td>
<td>2.6668</td>
<td>2.9302</td>
</tr>
<tr>
<td></td>
<td>2 Shift boss</td>
<td>28</td>
<td>3.0714</td>
<td>.40983</td>
<td>.07745</td>
<td>2.9125</td>
<td>3.2303</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>18</td>
<td>3.2778</td>
<td>.32175</td>
<td>.07584</td>
<td>3.1178</td>
<td>3.4378</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>106</td>
<td>2.9520</td>
<td>.49144</td>
<td>.04773</td>
<td>2.8573</td>
<td>3.0466</td>
</tr>
</tbody>
</table>

The result indicates variances within the three groups with regards to ownership.

Levene’s Test of Equality of Error Variances was applied to test the ANOVA assumption of homogeneity of variance amongst the three groups. The result is portrayed in Table 4-75 below:

Table 4-75  Levene’s Test of Equality of Error Variances (a) - Ownership

<table>
<thead>
<tr>
<th>Test of Homogeneity of Variances</th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner.mean</td>
<td>2.219</td>
<td>2</td>
<td>103</td>
<td>.114</td>
</tr>
</tbody>
</table>

The result F (2,103) = 2.22, p = .114, p >.05 indicated homogeneity of variance within the three groups.

The result of the ANOVA -F-ratio comparison of between subject effects is depicted in Table 4-76 below:

Table 4-76  ANOVA F – ratio Comparison of Between Subjects Effects for the three leader groups and Ownership

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner.mean</td>
<td>Between Groups</td>
<td>3.724</td>
<td>2</td>
<td>1.862</td>
<td>8.864</td>
</tr>
</tbody>
</table>
The result of $F(2) = 8.86$, $p = .000$, $p < .001$, $p < .05$ indicated that the result was not due to chance.

The Kruskal-Wallis Test Ranks and Test statistics (a, b) was applied to confirm within group variances and the results are depicted in Tables 4-77 and 4-78 below:

**Table 4-77 Kruskal-Wallis Test Ranks**

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>43.95</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>28</td>
<td>60.82</td>
</tr>
<tr>
<td>3 Manager</td>
<td>18</td>
<td>73.94</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4-78 Kruskal-Wallis Test statistics (a, b)**

<table>
<thead>
<tr>
<th>Test Statistics(a,b)</th>
<th>Owner.mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>15.393</td>
</tr>
<tr>
<td>df</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

The Chi-square result $x^2(2) = 15.393$, $p = .000$, $p < .05$ confirms the within group variance, but it is inconclusive as to which groups and to what extent the variance occurs.

The Scheffé multiple comparisons post hoc test was applied to determine within group variances with regards to Ownership and the results are reproduced in Table 4-79 below:
Table 4- 79  Scheffé Multiple Comparisons Post Hoc Test

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(I) group</th>
<th>(J) group</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner.mean Scheffe</td>
<td>1 Miner</td>
<td>2 Shiftboss</td>
<td>-.27294(*)</td>
<td>.10489</td>
<td>.038</td>
<td>-.5335 -.0124</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Manager</td>
<td>-.47929(*)</td>
<td>.12317</td>
<td>.001</td>
<td>-.7852 -.1734</td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>1 Miner</td>
<td>.27294(*)</td>
<td>.10489</td>
<td>.038</td>
<td>.0124 .5335</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Manager</td>
<td>-.20635</td>
<td>.13846</td>
<td>.333</td>
<td>-.5503 .1376</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>1 Miner</td>
<td>.47929(*)</td>
<td>.12317</td>
<td>.001</td>
<td>.1734 .7852</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Shiftboss</td>
<td>.20635</td>
<td>.13846</td>
<td>.333</td>
<td>-.1376 .5503</td>
</tr>
</tbody>
</table>

* The mean difference is significant at the .05 level.

The results of Manager – Shiftboss - p = 0.103, p >.05, and Shiftboss – Miner - p = .615, p >.05 indicated no statistically significant differences with regards to Ownership. The result for Manager – Miner - p = .006, p < .05 indicated a statistically significant difference with regards to Ownership.

**Conclusion**

The Manager – Miner group differed statistically significantly with regards to Ownership.

With regards to sub-hypothesis 1.6 it is concluded that:

- The null hypothesis that no statistically significant differences exist between Managers, Shiftbosses and Miners with regards to ownership is not accepted.
- The alternative hypothesis, which should state that a statistically significant difference exists between Managers and Miners with regards to Ownership, is accepted.
- Based on the empirical evidence, sub-hypothesis 1.6 is therefore rejected.

**Sub-hypothesis 1.7**

There is no statistically significant difference between Managers, Shiftbosses and Miners with regards to physical environment.
**Rationale:** Based on the fact that no evidence in the literature was found to support differences between Managers, Shiftbosses and Miners with regards to ownership, sub-hypothesis 1.7 is stated in a non-directional way.

In order to test sub-hypothesis 1.7 the following statistical procedures were applied with regards to physical environment:

- Reliability analysis
- Item total statistics
- One-way ANOVA descriptive statistics
- Levene's test of Equality of Error Variances (a)
- Brown-Forsythe Robust test of Equality of Means
- Kruskal-Wallis Test Ranks and Test statistics (a, b) (non parametric version of ANOVA)
- ANOVA F- ratio comparison of between subjects effects
- Dunnett T3 Multiple Comparisons Post Hoc Test.

The statistical results of the reliability analysis are discussed next:

The case - processing summary for physical environment is depicted in Table 4-80 below:

<table>
<thead>
<tr>
<th>Cases</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded(a)</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>

All 106 respondents were utilised for statistical analysis purposes with zero exclusions.

The reliability statistics are noted in Table 4-81 below:
Table 4- 81 Reliability Statistics for Physical Environment

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>.744</td>
<td>9</td>
</tr>
</tbody>
</table>

The Cronbach Coefficient Alpha value of .744 indicates high reliability.

The item total statistics if the item were deleted are illustrated in Table 4-82 below:

Table 4- 82  Item Total Statistics – Physical environment

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>item11</td>
<td>24.49</td>
<td>15.986</td>
<td>.369</td>
<td>.729</td>
</tr>
<tr>
<td>r.item12</td>
<td>24.37</td>
<td>16.654</td>
<td>.293</td>
<td>.740</td>
</tr>
<tr>
<td>item13</td>
<td>25.04</td>
<td>16.265</td>
<td>.347</td>
<td>.732</td>
</tr>
<tr>
<td>item14</td>
<td>24.58</td>
<td>14.894</td>
<td>.551</td>
<td>.698</td>
</tr>
<tr>
<td>item15</td>
<td>24.74</td>
<td>15.034</td>
<td>.625</td>
<td>.690</td>
</tr>
<tr>
<td>item16</td>
<td>24.95</td>
<td>14.598</td>
<td>.512</td>
<td>.703</td>
</tr>
<tr>
<td>r.item17</td>
<td>24.78</td>
<td>15.810</td>
<td>.340</td>
<td>.735</td>
</tr>
<tr>
<td>r.item18</td>
<td>24.85</td>
<td>16.453</td>
<td>.237</td>
<td>.754</td>
</tr>
<tr>
<td>item19</td>
<td>24.47</td>
<td>15.356</td>
<td>.605</td>
<td>.695</td>
</tr>
</tbody>
</table>

The reliability analysis for physical environment is complete.

A one-way ANOVA was conducted to establish within group variances with regards to mean scores in respect of physical environment. The results of the one-way ANOVA are depicted in Table 4-83 below:
Table 4- 83 Descriptive statistics for the three leader group levels and Physical Environment

<table>
<thead>
<tr>
<th>Descriptives</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
</tr>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>2.9963</td>
<td>.54547</td>
<td>.07042</td>
<td>2.8554</td>
<td>3.1372</td>
<td>1.78</td>
</tr>
<tr>
<td>2 Shiftbosses</td>
<td>28</td>
<td>3.1270</td>
<td>.40200</td>
<td>.07597</td>
<td>2.9711</td>
<td>3.2829</td>
<td>2.00</td>
</tr>
<tr>
<td>3 Manager</td>
<td>18</td>
<td>3.3272</td>
<td>.28892</td>
<td>.06810</td>
<td>3.1835</td>
<td>3.4708</td>
<td>2.89</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>3.0870</td>
<td>.48711</td>
<td>.04731</td>
<td>2.9932</td>
<td>3.1808</td>
<td>1.78</td>
</tr>
</tbody>
</table>

The results depict statistically significant differences in the mean scores for Managers, Shiftbosses and Miners.

Levene’s Test of Equality of Error Variances was applied and the result is depicted in Table 4-84 below:

Table 4-84 Levene’s Test of Equality of Error Variances (a)- Physical Environment

<table>
<thead>
<tr>
<th>Test of Homogeneity of Variances</th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical.mean</td>
<td>5.084</td>
<td>2</td>
<td>103</td>
<td>.008</td>
</tr>
</tbody>
</table>

The result F (2,103) = 5.08, p = .008, p < .05 indicated heterogeneity of variance resulting in the violation of ANOVA (homogeneity of variance) and Field (2005) proposes steps to correct the violation of ANOVA.

The Brown-Forsythe Robust Test of Equality of Means was applied when an assumption of ANOVA was violated. The result is provided in Table 4-85 below:
Table 4- 85 Brown- Forsythe Robust Tests of Equality of Means

<table>
<thead>
<tr>
<th>Physical.mean</th>
<th>Brown-Forsythe</th>
<th>Statistic(a)</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical.mean</td>
<td>Brown-Forsythe</td>
<td>4.968</td>
<td>2</td>
<td>92.488</td>
<td>.009</td>
</tr>
</tbody>
</table>

a Asymptotically F distributed.

The result of F (2) = 4.97, p = .009, p < .05 indicated that the result was not due to chance.

The Kruskal-Wallis Test Ranks and Test statistics (a, b) was applied to determine and confirm within group variances and the results are shown in Table 4-86 and 4-87 below:

Table 4- 86 Kruskal-Wallis Test Ranks

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Miner</td>
<td>60</td>
<td>47.14</td>
</tr>
<tr>
<td>2 Shiftboss</td>
<td>28</td>
<td>56.86</td>
</tr>
<tr>
<td>3 Manager</td>
<td>18</td>
<td>69.47</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td></td>
</tr>
</tbody>
</table>

Table 4- 87 Kruskal- Wallis Test statistics (a, b)

<table>
<thead>
<tr>
<th>Test Statistics (a, b)</th>
<th>Physical mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>7.801</td>
</tr>
<tr>
<td>df</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.020</td>
</tr>
</tbody>
</table>

a Kruskal Wallis Test
b Grouping Variable: group
The Chi-square result: \( x^2 (2) = 7.8, p = .020, p < .05 \) confirmed the within group variances with regards to physical environment, but was inconclusive as to which groups and to what extent the variances existed.

The result of the ANOVA F- ratio test of between subjects effects are displayed in Table 4-88 below:

### Table 4- 88 ANOVA F- ratio Comparison of Between Subjects Effects for the three leader groups and Physical Environment

<table>
<thead>
<tr>
<th>Tests of Between-Subjects Effects</th>
<th>Dependent Variable: physical mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>Type III Sum of Squares</td>
</tr>
<tr>
<td>Corrected Model</td>
<td>1.577(a)</td>
</tr>
<tr>
<td>Intercept</td>
<td>827.439</td>
</tr>
<tr>
<td>Group</td>
<td>1.577</td>
</tr>
<tr>
<td>Error</td>
<td>23.337</td>
</tr>
<tr>
<td>Total</td>
<td>1035.049</td>
</tr>
<tr>
<td>Corrected Total</td>
<td>24.914</td>
</tr>
</tbody>
</table>

a R Squared = .063 (Adjusted R Squared = .045)

The result of \( F (2) = 3.48, p = .035, p < .05, r = .25 \) indicated variance within the groups but it was inconclusive which groups varied and to what extent. The result of \( r = .25 \) indicates a small effect size.

The Dunnett T3 Multiple Comparisons Post Hoc Test was applied to determine within group variances with regards to Physical Environment and the results are sketched in Table 4-89 below:

### Table 4- 89 Dunnett T3 Multiple Comparisons Post Hoc Test

<table>
<thead>
<tr>
<th>Multiple Comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
</tr>
</tbody>
</table>

428
The results of Manager – Shiftboss – p = .157, p > .05 and Shiftboss – Miner - p = .506, p > .05 indicated no statistically significant differences with regards to physical environment. The result for Manager – Miner – p = .004, p < .05 however indicated significant statistical differences with regards to Physical Environment.

Conclusion
The Manager- Miner group differed statistically significantly with regards to Physical Environment.

With regards to sub-hypothesis 1.7, it is concluded that:

- The null hypothesis that no statistically significant differences exist between Managers, Shiftbosses and Miners with regards to physical environment is not accepted.
- The alternative hypothesis, which should state that there is a statistically significant difference between Managers and Miners with regards to physical environment, is accepted.
- Based on the empirical evidence, sub-hypothesis 1.7 is therefore rejected.

Sub-hypothesis 1.8
There is no statistically significant difference between Managers, Shiftbosses and Miners with regards to safety intent.
**Rationale:** Based on the fact that no evidence in the literature was found to support differences between Managers, Shiftbosses and Miners with regards to safety intent, sub-hypothesis 1.8 is stated in a non-directional way.

In order to test sub-hypothesis 1.8 the following statistical procedures were applied with regards to physical environment:

- Reliability analysis
- Item total statistics
- One-way ANOVA descriptive statistics
- Levene’s test of Equality of Error Variances (a)
- Brown-Forsythe Robust Test of Equality of Means
- Kruskal-Wallis Test Ranks and Test statistics (a, b) (non parametric version of ANOVA)
- ANOVA F- ratio comparison of between subjects effects
- Dunnett T3 Multiple Comparisons Post Hoc Test

The statistical results of the reliability analysis are discussed next:

The case – processing summary for Safety Intent is depicted in Table 4-90 below:

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>106</td>
<td>100.0</td>
</tr>
<tr>
<td>Excluded(a)</td>
<td>0</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>

A Listwise deletion based on all variables in the procedure.

All 106 respondents were utilised for statistical analysis purposes with zero exclusion.

The reliability statistics for safety intent are portrayed in Table 4-91 below:
Table 4-91 Reliability Statistics – Safety Intent

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach’s Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.730</td>
<td>6</td>
</tr>
</tbody>
</table>

The Cronbach Coefficient Alpha value of .730 indicates high reliability. The item total statistics are depicted in Table 4-92 below:

Table 4-92 Item Total Statistics – Safety Intent

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>r.item20</td>
<td>13.95</td>
<td>10.826</td>
<td>.339</td>
<td>.732</td>
</tr>
<tr>
<td>item21</td>
<td>13.70</td>
<td>10.498</td>
<td>.477</td>
<td>.688</td>
</tr>
<tr>
<td>item22</td>
<td>13.47</td>
<td>10.042</td>
<td>.615</td>
<td>.651</td>
</tr>
<tr>
<td>item23</td>
<td>14.00</td>
<td>10.267</td>
<td>.462</td>
<td>.693</td>
</tr>
<tr>
<td>item24</td>
<td>13.95</td>
<td>9.912</td>
<td>.580</td>
<td>.657</td>
</tr>
<tr>
<td>r.item25</td>
<td>13.66</td>
<td>11.293</td>
<td>.344</td>
<td>.725</td>
</tr>
</tbody>
</table>

The reliability statistics are complete.

A one-way ANOVA was conducted to establish whether there were variances amongst the three groups.

The descriptive statistics of the sub-construct Safety Intent are shown in Table 4-93 below:

Table 4-93 Descriptive statistics for the three leader group levels and Safety Intent

<table>
<thead>
<tr>
<th>Descriptives</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
</tr>
<tr>
<td>Safety.mean</td>
<td>1 Miner</td>
<td>60</td>
<td>2.6278</td>
<td>2.8077</td>
<td>1.33</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>28</td>
<td>2.8274</td>
<td>3.0403</td>
<td>1.83</td>
<td>4.00</td>
<td></td>
</tr>
</tbody>
</table>
There were statistically significant differences between the mean scores of Managers, Shiftbosses and Miners. Levene’s test of Equality of Error Variances (a) was applied and the results are noted in Table 4-94 below:

<table>
<thead>
<tr>
<th>Manager</th>
<th>18</th>
<th>3.0833</th>
<th>0.33456</th>
<th>0.07886</th>
<th>2.9170</th>
<th>3.2497</th>
<th>2.50</th>
<th>3.67</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>106</td>
<td>2.7579</td>
<td>0.63042</td>
<td>0.06123</td>
<td>2.6365</td>
<td>2.8793</td>
<td>1.33</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Table 4-94 Levene’s Test of Equality of Error Variances (a) – Safety Intent

<table>
<thead>
<tr>
<th>Test of Homogeneity of Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levene Statistic</td>
</tr>
<tr>
<td>Safety.mean</td>
</tr>
</tbody>
</table>

The result $F (2,103) = 6.06, p = .003, p < .05$ indicated heterogeneity of variance resulting in the violation of ANOVA (homogeneity of variance) and Field (2005) proposes steps to correct the violation of ANOVA.

The Brown-Forsythe Robust Test of Equality of Means was applied, the results of which are depicted in Table 4-95 below:

<table>
<thead>
<tr>
<th>Robust Tests of Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistic(a)</td>
</tr>
<tr>
<td>Safety mean</td>
</tr>
</tbody>
</table>

The result of $F (2)= 5.28, p = .004, p < .05$ indicated that the result was not due to chance.

The Kruskal-Wallis Test Ranks and Test statistics (a, b) was applied to determine and confirm within group variance and the results are listed in Tables 4-96 and 4-97 below:
Table 4-96 Kruskal-Wallis Test Ranks

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety.mean</td>
<td>1 Miner</td>
<td>60</td>
<td>47.76</td>
</tr>
<tr>
<td></td>
<td>2 Shiftboss</td>
<td>28</td>
<td>55.21</td>
</tr>
<tr>
<td></td>
<td>3 Manager</td>
<td>18</td>
<td>69.97</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>106</td>
<td></td>
</tr>
</tbody>
</table>

Table 4-97 Kruskal-Wallis Test statistics (a, b)

<table>
<thead>
<tr>
<th>Safety.mean</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>7.399</td>
<td>df</td>
<td>2</td>
<td>Asymp. Sig.</td>
</tr>
</tbody>
</table>

The Chi-square result $x^2 (2) = 7.39$, $p= .025$, $p < .05$ confirmed the within group variance with regards to Safety Intent but it was inconclusive as to which groups and to what extent the variance existed.

The Dunnett T3 Multiple Comparisons Post Hoc Test was applied to determine within group variances with regards to Safety Intent and the results are depicted in Table 4-98 below:

Table 4-98 Dunnet T3 Multiple Comparisons Post Hoc Test

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(I) group</th>
<th>(J) group</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
</tr>
<tr>
<td>Safety.mean</td>
<td>Dunnett T3</td>
<td>1 Miner</td>
<td>2 Shiftboss</td>
<td>3 Manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Miner</td>
<td>.19960</td>
<td>.13730</td>
<td>.384</td>
<td>-.5357</td>
</tr>
</tbody>
</table>

The Dunnett T3 Multiple Comparisons Post Hoc Test was applied to determine within group variances with regards to Safety Intent and the results are depicted in Table 4-98 below:
The results for Manager – Shiftboss - p = .156, p > .05 and Shiftboss – Miner - p = .384, p > .05 indicated no statistically significant differences with regards to Safety Intent.

The results for Manager – Miner - p = .001, p < .05 however indicated a significant statistical difference with regards to Safety Intent.

**Conclusion**

The Manager – Miner group differed statistically significantly with regards to Safety Intent.

With regards to sub-hypothesis 1.8 it is concluded that:

- The null hypothesis that no statistically significant differences exist between Managers, Shiftbosses and Miners with regards to Safety Intent cannot be accepted.
- The alternative hypothesis, which should state that there is a statistically significant difference between Managers and Miners with regards to Safety Intent, is accepted.
- Based on the empirical evidence, sub-hypothesis 1.8 is therefore rejected.

A summary of the empirical results of the three levels of analyses is provided in Table 4 -99 below:

<table>
<thead>
<tr>
<th></th>
<th>Shiftboss</th>
<th>Manager</th>
<th>Miner</th>
<th>Shiftboss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>.-25595</td>
<td>.13032</td>
<td>.156</td>
</tr>
<tr>
<td>3</td>
<td>Manager</td>
<td>.45556(*)</td>
<td>.11961</td>
<td>.001</td>
</tr>
</tbody>
</table>

* The mean difference is significant at the .05 level.
Table 4 – Summary of Empirical results

<table>
<thead>
<tr>
<th></th>
<th>SHMI</th>
<th>Relationship Credibility</th>
<th>Climate</th>
<th>Culture</th>
<th>Trust</th>
<th>Caring Support</th>
<th>Ownership</th>
<th>Physical Environment</th>
<th>Safety Intent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers - Shift-bosses</td>
<td>p=.081, p&gt;.05</td>
<td>p=.106, p&gt;.05</td>
<td>*</td>
<td>p=.596, p&gt;.05</td>
<td>*</td>
<td>p=.103, p&gt;.05</td>
<td>p=.333, p&gt;.05</td>
<td>p=.15, p&gt;.05</td>
<td>p=.156, p&gt;.05</td>
</tr>
<tr>
<td>Shift-bosses-Miners</td>
<td>p=.388, p&gt;.05</td>
<td>p=.346, p&gt;.05</td>
<td>*</td>
<td>p=.758, p&gt;.05</td>
<td>*</td>
<td>p=.999, p&gt;.05</td>
<td>p=.615, p&gt;.05</td>
<td>p=.038, p&gt;.05</td>
<td>p=.506, p&gt;.05</td>
</tr>
<tr>
<td>Managers-Miners</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

* Significant differences

- With regards to the SHMI of Managers, Shiftbosses and Miners, Managers and Miners differed statistically significantly.
- With regards to the construct relationship credibility, the Manager-Miner group differed statistically significantly.
- With regards to the construct climate, Managers – Shiftbosses and Managers – Miners differed statistically significantly.
- With regards to culture there were no statistically significantly differences between Managers, Shiftbosses and Miners.
- With regards to the subconstruct trust, Managers – Shiftbosses and Managers – Miners differed statistically significantly.
- With regards to the sub-construct caring support, Managers – Miners differed statistically significantly.
- With regards to the sub-construct ownership, Shiftbosses – Miners and Managers – Miners differed statistically significantly.
- With regards to the sub-construct physical environment, Managers – Miners differed statistically significantly.
• With regards to the subconstruct safety intent, Managers – Miners differed statistically significantly.

4.5 Summary of Main Findings

The objectives set for this study will be utilised as the basis for identifying the main findings subsequent to the statistical analyses.

As discussed in Chapter 1, the primary empirical research objective is to apply the SHMI with the aim of determining the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners in the target organisation.

The results emanating from the application of the SHMI leads to secondary empirical research objectives, which are:

• Analyse and interpret differences in the safe mindset of the three leader levels with the aim of identifying interventions to improve safety in a sustainable manner.
• Identify possible development needs in the three leader levels with recommended interventions.

The results of the statistical analyses are:

4.5.1 Application of the SHMI

Phase One focused on the sample statistics, factor analysis and reliability analysis.

The main findings are as follows:

• A total of 106 employees completed the SHMI and all 106 could be utilised for purposes of statistical analysis. Managers (N1=18), Shiftbosses (N2=28) and Miners (N3=60).
• Although relatively small in number (N=106), sufficient statistical analysis could be performed.
• No random sampling methods were applied and the total populations for Managers, Shiftbosses and Miners were utilised in the completion of the SHMI.
• The target organisation is relatively young (six years) in operation at the time of the study.
• With regards to age, 55% of respondents were 41 years and older.
• The SHMI indicated that most items (54) had a normal distribution with only six (6) outliers.
• The distribution was slightly negatively shaped in terms of skewness and kurtosis indicated a leptokurtic distribution. The Kolmogorov - Smirnhov (a) statistic indicated normality.
• The sixty (60) items SHMI was applied in different organisations prior to this study and yielded acceptable Cronbach-Alpha Coefficient values.

With regards to this study, a Cronbach Alpha Coefficient of .911 was obtained indicating high reliability and the SHMI consequently can consistently measure the safe mindset (safety motivational intent) in similar organisations. This indicates that the SHMI has a high level of homogeneity amongst items applied and is capable of consistently reflecting the same underlying constructs.

**Communality**

- The communality of .72 confirms high reliability.

Phase Two focused on the testing of hypotheses through the application of inferential statistical procedures as well as certain post hoc tests.

- The tests that were applied were:
  - ANOVA (analysing variance)
  - Levene’s test of homogeneity variance
  - F-ratio analysis where homogeneity of variance was confirmed
  - Brown-Forsythe where heterogeneity of variance occurred
  - Kruskal-Wallis test (non parametric version of ANOVA)
  - Multiple comparisons tests (Scheffé in respect of F-ratio analysis and Dunnett T3 in respect of Brown-Forsythe).

A summary of the main findings is discussed below:

The main findings were as follows:
One integrative hypothesis with eight (8) sub-hypotheses were formulated and tested. The sub-hypotheses were all stated in a non-directional way since no evidence was found in the literature survey that supported the relationship of a safe mindset on the three leader levels.

- Integrative hypothesis H01: There is no statistically significant difference between the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners. Sub-hypotheses were stated in the three levels of statistical analysis.

- **Level One**
  - Hypothesis H01. There is no statistically significant difference between the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners.

    As a result of the empirical evidence, hypothesis H01 was rejected since a significant statistical difference existed between Managers and Miners.

- **Level Two**
  Three sub-hypotheses were stated in terms of the three main constructs of the SHMI namely relationship credibility, climate and culture.

  - Sub-hypothesis 1.1 - Relationship credibility: There is no statistically significant difference between Managers, Shiftbosses and Miners.

    As a result of the empirical evidence, sub-hypothesis 1.1 was rejected since a significant statistical difference existed between Managers and Miners.

  - Sub-hypothesis 1.2 – Climate: There is no statistically significant difference between Managers, Shiftbosses and Miners.
As a result of the empirical evidence, sub-hypothesis 1.2 was rejected, since statistically significant differences existed between Managers and Shiftbosses as well as Managers and Miners.

- Sub-hypothesis 1.3 – Culture: There is no statistically significant difference between Managers, Shiftbosses and Miners.

As a result of the empirical evidence, sub-hypothesis 1.3 was accepted, since no statistically significant difference existed between Managers, Shiftbosses and Miners.

- **Level Three**
  Five sub-hypotheses were formulated in terms of five sub-constructs that yielded Cronbach-Coefficient Alpha values of >.7.

- Sub-hypothesis 1.4 – Trust: There is no statistically significant difference between Managers, Shiftbosses and Miners.

As a result of the empirical evidence, sub-hypothesis 1.4 was rejected since statistically significant differences existed between Managers and Shiftbosses as well as Managers and Miners.

- Sub-hypothesis 1.5 – Caring Support: There is no statistically significant difference between Managers, Shiftbosses and Miners.

As a result of the empirical evidence, sub-hypothesis 1.5 was rejected since a significant statistical difference existed between Managers and Miners.

- Sub-hypothesis 1.6 – Ownership: There is no statistically significant difference between Managers, Shiftbosses and Miners.
As a result of the empirical evidence, sub-hypothesis 1.6 was rejected since statistically significant differences existed between Managers and Miners as well as Shiftbosses and Miners.

- Sub-hypothesis 1.7 – Physical Environment: There is no statistically significant difference between Managers, Shiftbosses and Miners.

As a result of the empirical evidence, sub-hypothesis 1.7 was rejected since a significant statistical difference existed between Managers and Miners.

- Sub-hypothesis 1.8 – Safety Intent: There is no statistically significant difference between Managers, Shiftbosses and Miners.

As a result of the empirical evidence, sub-hypothesis 1.8 was rejected since a significant statistical difference existed between Managers and Miners.

### 4.5.2 Conclusion Phase Two

The results of the various statistical procedures were analysed and reported per sub-hypothesis.

The results of the study indicate that the Safe Mindset of Managers, Shiftbosses and Miners differ with regards to the various constructs and sub constructs that were measured. Culture was the only construct measured that reflected no statistically significant differences between Managers, Shiftbosses and Miners.

The rejection of Hypothesis H01 and sub-hypotheses 1.1 – 1.2 and 1.4 – 1.8 with the exception of sub-hypothesis 1.3, result in the achievement of the empirical study objective.

It is therefore concluded that the empirical study objectives as stated in Chapter 1 was achieved.

### 4.6 Conclusion
In this chapter the results of various validity and reliability analyses, statistical procedures and post hoc tests were analysed, interpreted and discussed and various observations were made. The results of the application of inferential statistical procedures (parametric – ANOVA and non-parametric Kruskal-Wallis), ANOVA F-ratio, Levene’s test, tests of between-subject effects and multiple comparisons post hoc tests were revealed.

The results of this chapter indicate that there are statistically significant differences between Managers, Shiftbosses and Miners on the three levels measured (SHMI, three main constructs and five sub-constructs). Only the construct of culture indicated no statistically significant difference between Managers, Shiftbosses and Miners.

The empirical study objective to establish the safe mindset (Safety motivational intent) of Managers, Shiftbosses and Miners has been achieved.

The next chapter will discuss and interpret the results of this chapter as well as integrate the results with existing information pertaining to the safe mindset of Managers, Shiftbosses and Miners.
Chapter 5

Discussion of the Study Results

If you can’t explain it simply,
   You don’t understand it well enough...

- Albert Einstein
CHAPTER 5: DISCUSSION OF THE STUDY RESULTS

5.1 Introduction
In Chapter 4 the empirical results of the various statistical procedures were documented, interpreted, explained and certain observations were made. The results portrayed were in the form of descriptive statistics, One-way analysis of variance, (ANOVA) Non-Parametric and Multiple Comparisons Post Hoc tests.

The focus of Chapter 5 is on discussing the results obtained from the application of the statistical procedures in an attempt to explain differences in the safe mindset (safety motivational intent) of the Managers, Shiftbosses and Miners in the target organisation. The findings of the study and conclusions drawn are also discussed.

It will be postulated that the theoretical and empirical objectives of the study have been achieved.

5.2 Review of the study
The objectives of the study were discussed in Chapter 1 and entailed both literature and empirical study objectives.

The primary literature review objectives are to create a theoretical frame of reference of the world-class organisation and the Safe Human Mindset model (on which the SHMI is based).

The primary empirical study objective is to apply the SHMI to Managers, Shiftbosses and Miners in the target organisation with the purpose of establishing their respective safe mindsets (safety motivational intent).

The SHMI was administered in the target organisation to the total population of Managers, Shiftbosses and Miners and the results were analysed and portrayed in Chapter 4.

5.3 Key results of the literature review
The literature review addressed the World-Class Organisation and the Safe Human Mindset Model discussed in Chapter 2.
5.3.1 The World-Class Organisation
The World-Class Model was theoretically discussed in detail with specific emphasis on leadership, joint governance and business results.

Leadership is a broad subject therefore leadership in an organisational context was researched with a focus on organisational strategy, change, culture and climate, care and growth as well as transactional and transformational leadership. Since the introduction of the World-Class Model in 1999, a contemporary approach to the study of leadership was included as well. When differences in the leadership with regards to their safe mindset (safety motivational intent) exist, the execution of a safety strategy, affecting change and caring and growing subordinates to an incident free work environment remain difficult. Transformation is achieved through leaders.

Competitiveness ( organisational image) within business results in the World-Class Model was expanded to include Corporate Governance and Business Ethics, which are subsequent developments to the original World-Class model of 1999. Where applicable, the aspects of organisational health and safety were discussed within the various constructs of the World-Class Model.

Conclusion
It is concluded that the World-Class Model can be appropriately applied to any organisation striving to become world-class from a health and safety perspective.

5.3.2 The Safe Human Mindset Model
The theoretical foundation of the various constructs of the Safe Human Mindset Model was discussed in detail. The SHMI measures the various constructs of the Safe Human Mindset Model and enabled the empirical study, the results of which were reported in Chapter 4 and are discussed next.

5.4 Key empirical findings
The empirical findings are discussed according to the analyses methodology utilised in Chapter 4. Phase One addresses the descriptive factors and reliability analysis. Phase - Two addresses the results of applied inferential statistical procedures with the specific aim of testing hypotheses.
5.4.1 Phase One: Empirical findings

Phase One of the statistical procedures is discussed next and includes descriptive statistics, factor and reliability analysis.

5.4.1.1 Descriptive statistics

The SHMI indicated that the majority of items had a close to normal distribution. This indicates that the majority of scores lie around this centre of the distribution (Field, 2005). The distribution was slightly negatively skewed (with six outliers) with a leptokurtic inclination. The normal distribution facilitates the application of parametric tests (Field, 2005).

5.4.1.2 Factor analysis

The key findings of the factor analysis on the item scores of the SHMI are discussed next.

5.4.1.2.1 Validity

Validity in quantitative research refers to statistical analysis of questionnaire construction as well as statistical hypothesis testing. Validity is distinguished in two parts namely construct validity where the instrument measures what it was designed to measure and the construct is measured accurately as well (De Vos et al, 2000).

The forms of validity that are applicable to the SHMI are discussed next.

- Construct validity
  
  Construct validity has to do with the measuring of the instrument and measures the degree to which an instrument measures a theoretical construct to which it was designed to measure. The average communality of .66 obtained in this study is >.5 which, according to Field (2005), indicates validity.

  It is concluded that the SHMI measured what it was supposed to measure.

- Content validity is defined by de Vos et al (2000) as the representativeness or sampling adequacy of the content (topics or items) of a measuring instrument.
The total populations for Managers (N1=18), Shiftbosses (N2=28) and Miners (N3=60) Total (N=106) were subjected to the SHMI.

With regards to factor analysis, seventeen factors were retained with an eigenvalue > 1. Coetzee (2006) professes that the more reliable a test or an instrument, the more valid it is. The reliability and validity statistics of the SHMI are as follows:

5.4.1.2.2 Reliability
Reliability, according to De Vos et al (2000), is the accuracy or precision of an instrument. The degree of consistency between two independently derived sets of scores and the independent administration of the instrument yield the same scores in comparable conditions and would therefore be considered reliable. De Vos et al (2000) associate predictability, stability, dependability and consistency with reliability.

- Cronbach-Coefficient Alpha
  The Cronbach-Coefficient Alpha is an indication of reliability and Coetzee (2006) states a Cronbach Alpha of .7 and higher indicates high reliability before a test can be used with confidence.

  A total of 106 responses were included in the responses and Table 4 – 16 depicts the reliability statistics from the reliability analysis. The Cronbach-Coefficient Alpha value indicates that the SHMI have acceptable reliability and indicates a high degree of homogeneity between items in the instrument.

  A Cronbach-Coefficient Alpha of .911 was indicated after the items were reflected. This indicates high reliability. The Cronbach-Coefficient Alpha > .7 of the reliability analysis when the SHMI was previously applied in the mining industry indicates high reliability.

- Communality
  During factor analysis the proportion of common variance in a variable is determined and expressed as communality.
Field (2005) expressed communality between 0 and 1 and a communality of .5 and greater reflects high communality.

According to Wulder (2005), correlation coefficients tend to be less reliable when estimated from relatively small sample sizes (in this study). Communality in factor analysis addresses this concern. According to StatSoft (2003), factor analytic techniques reduce the number of variables and detect structure in the relationship between variables.

The average communality of .66 reflected in Table 4-13 indicates high communality thereby confirming construct validity.

It is therefore concluded that the SHMI is valid and reliable to be used to test the hypotheses in the section (Phase Two) that follows:

An aspect that needs to be addressed is the age of the respondents.

Fifty five percent (55%) of all respondents were older than 41 years and the mine is a relatively young mine of six years in full production.

Coetzee (2006) refers to a study by Frances (2003) which found that during organisational change, longer serving employees, notably supervisors and middle managers were less likely to support a specific change initiative and were also less likely to exit the organisation. Coetzee (2006) however found no statistically significant difference in age and barriers to change.

This is a dichotomy that management must address at the middle management and supervisory levels since change is a regular feature of organisational management and mines are no different.

5.4.2 Phase Two
A single, integrative hypothesis with nine (9) sub-hypotheses was formulated to determine the safe mindset of Managers, Shiftbosses and Miners in the target organisation.

**The integrative hypothesis H01 that forms the basis of this study is:**

There is no statistically significant difference between the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners.

The statistical analyses were conducted on three levels. The first level of analysis focused on The Safe Human Mindset Index for Managers, Shiftbosses and Miners, the second level of analysis focused on the three main constructs of relationship credibility, climate and culture, and the third level of analysis focused on the sub-constructs of trust, caring support, ownership, physical environment and safety intent.

Only sub-constructs that yielded Cronbach Coefficient Alpha values >.7 were considered for purposes of discussion with the exception of trust, which was close to .7.

The empirical findings within the three levels of analyses are discussed next.

**5.4.2.1 Level One**

- **Hypothesis H01**

Hypothesis H01 postulated that there is no statistically significant difference between the safe mindset (safety motivational intent) of Managers, Shiftbosses and Miners.

The results of the p-values in the Multiple Comparisons Post Hoc Test statistical analysis in the study (see Table 4-25) indicated a significant statistical difference between Managers and Miners. The result of no significant differences between Managers and Shiftbosses as well as Shiftbosses and Miners lead to the conclusion that the overall safe mindset has not been established below Shiftboss level (at Miner level and downwards).
Based on the findings of this study, Hypothesis H01 is therefore rejected.

This is an important finding since no evidence in the relevant literature could be found to support the findings of this study. O’Dea et al (2003) identified different responsibilities for safety at different leader levels in the organisation which support the findings of this study. Various leader factors within various leader levels in an organisation mediated a safe mindset. Emotional intelligence (Singh, 2007), style (The Wikipedia free Encyclopaedia, 2007b), receptiveness and responsiveness to change (O’Dea et al, 2003) all contributed to leadership creating an environment conducive to safe performance.

5.4.2.2 Level Two
The empirical results of the constructs Relationship Credibility, Climate and Culture are discussed next.

5.4.2.2.1 Relationship credibility
Sub-hypothesis 1.1 postulates that there is no statistically significant difference between Managers, Shiftbosses and Miners with regards to Relationship Credibility.

The results of the p values in the Multiple Comparisons Post Hoc test statistical analysis in the study (see Table 4-34) indicate statistically significant differences between Managers and Miners.

The result of no statistically significant difference between Managers and Shiftbosses and Shiftbosses and Miners leads to the conclusion that credible relationships have not been established below Management level.

Based on the findings of this study, hypothesis 1.1 is therefore rejected.

The empirical study of Singh (2007) supports the importance of credible relationships. Building credible relationships is a trait of an emotionally intelligent leader. Singh (2007) associates emotional intelligence with organisational
learning ability and states emotionally intelligent leaders created credible relationships that significantly enhanced performance, goodwill and trust.

Schutte (1998) argues that relationship credibility embraces the trueness of a working relationship that bonds individuals as a team through a caring process.

5.4.2.2.2 Climate

Sub-hypothesis 1.2 postulates that there are no statistically significant differences between Managers, Shiftbosses and Miners with regards to Climate.

The results of the p values in the Multiple Comparisons Post Hoc test statistical analysis in the study (see Table 4-43) indicate statistically significant differences between Managers and Shiftbosses as well as Managers and Miners.

The result of no statistically significant difference between Shiftboss and Miners leads to the conclusion that an organisational climate conducive to safe production has not been established to the expectations of management below Managerial level (Shiftboss and downwards).

Based on the findings of this study, sub-hypothesis 1.2 is thus rejected.

The study of Ecotec (2005) supports the effect of organisational climate on health and safety and found that organisational climate contained certain obstacles to worker involvement in health and safety in the workplace, specifically where attitudes to risks, participation and the work environment were concerned.

The study by Anseel and Lievens (2007) identified that feedback impacted on job satisfaction (Climate), which supports the findings of this study.

- The provisions of the South African Mine Health and Safety Act 29 of 1996 makes it mandatory for management to create a climate of Safe performance specifically responses to risks in the physical work environment and participation in health and safety issues of all employees through representative structures. This is supported through provisions for example safety training.
An empirical study by Gyekye and Salminen (2006) confirmed the association between job satisfaction (an element of climate) and causal attributions for accident occurrence.

Clarke and Ward (2006) found in an empirical study that leadership influence, associated with a transformational style mediated organisational climate.

O’Dea et al, (2003) discovered through an empirical study, that the attitudes of management influenced the attitudes and behaviours of middle management, which in turn influenced relationships and styles of leadership down the organisational hierarchy.

Clarke et al (2006) established through empirical research that a relationship exists between organisational climate and employee compliance to and participation in safety. The various organisational leaders consequently influenced the organisational climate. This study found a difference in climate from managerial level and downwards to Miner level.

In conclusion, research emphasizes the leadership process in creating a climate conducive to safe performance.

5.4.2.2.3 Culture

Sub-hypothesis 1.3 postulated that there is no significant statistical difference between Managers, Shiftbosses and Miners with regards to Culture.

The results of the p values in the Multiple Comparisons Post Hoc test statistical analysis in the study (see Table 4-52) indicate no statistically significant difference between Managers, Shiftbosses and Miners. The conclusion is made that safety values and beliefs are equally developed and shared within the three groups.

Based on the findings of the study, sub-hypothesis 1.3 is therefore accepted. Improvements however in the safety culture of shared values and common beliefs will be the responsibility of Managerial Leadership who determines the prevailing
culture in an organisation. The results of this study support the relevant literature with regards to Culture.

Van Aardt's (1995) empirical research found that when employees perceived organisational commitment for safety, their belief system of safety was greatly enhanced. Similarly, an empirical study by Larsson, Sjöberg, Vrbanjac and Björkman (2005) found that indirect leadership consisting of interaction down the line and role modelling contributed to a culture of safety commitment and participation.

5.4.2.3 Level 3
The empirical results of the sub-constructs Trust, Caring Support, Ownership, Physical Environment and Safety Intent are discussed next.

5.4.2.3.1 Trust
Sub-hypothesis 1.4 postulates that there is no statistically significant difference between Manager, Shiftbosses and Miners with regards to Trust.

The results of the $p$ values in the Multiple Comparisons Post Hoc test statistical analysis in the study (See Table 4-61) indicated statistically significant differences between Managers and Shiftbosses as well as Managers and Miners.

The result of no statistically significant difference between Shiftbosses and Miners leads to the conclusion that trust has not been created and established below managerial level (Shiftbosses and downwards).

Based on the findings of this study, sub-hypothesis 1.4 is therefore rejected.

Conchie et al (2006) argue that trust does not only function with leaders and followers and report a study by Edmondson (1999) found the presence of trust amongst individuals and groups (teams) resulted in more open communication and contributed to 'psychological safety'.

Sinha and Jackson (2005), report that studies conducted by Conger (1999) found leaders needed to create identity with followers that would result in meeting
performance expectations. The identity was trust based. Identification based - trust was addressed in Chapter 2, sub-section 2.2. Conchie, Donald and Taylor (2006), report that studies by Carroll (2002), suggested that prevailing trust levels in high-risk organisations predetermined the effectiveness of communication where safety was concerned.

5.4.2.3.2 Caring Support
Sub-hypothesis 1.5 postulates that there is no statistically significant difference between Managers, Shiftbosses and Miners with regards to caring support.

The results of the p values in the Multiple Comparisons Post Hoc test statistical analysis in the study (see Table 4-70) indicate a statistically significant difference between Managers and Miners.

The results that no statistically significant differences between Managers and Shiftbosses as well as Shiftbosses and Miners exist, leads to the conclusion that aspects of caring support have not been established below shiftboss level.

Based on the findings of this study, sub-hypothesis 1.5 is therefore rejected.

O’Dea et al, (2003) reports that empirical studies by Griffin and Neal (2000) found that supportive supervision made an independent positive contribution to workers’ self reported safety motivation and safety compliance. This was particularly applicable at supervisory level. O’Dea et al, (2003) however determined empirically that different leader skills at different levels in the organisation were required for specific safety outcomes.

The results of the caring support of leaders in this study support empirical studies in this regard.

5.4.2.3.3 Ownership
Sub-hypothesis 1.6 postulated that there is no statistically significant difference between Managers, Shiftbosses and Miners with regards to ownership.
The results of the p values in the Multiple Comparisons Post Hoc test statistical analysis in the study (see Table 4-79) indicate a statistically significant difference between Managers and Miners.

The results that there are no statistically significant differences between Managers and Shiftbosses as well as Shiftbosses and Miners leads to the conclusion that the aspects of ownership has not been established below shiftboss level.

Based on the findings in this study, sub-hypothesis 1.6 is therefore rejected.

An empirical study by Hamlin and Sawyer (2007) not only found that leaders needed to create ownership within subordinates, but leaders also needed to develop themselves to take ownership. Failure to incorporate these new styles of management would lead to perceptions of being ineffective as leaders.

5.4.2.3.4 Physical environment
Sub-hypothesis 1.7 postulated that there is no statistically significant difference between Managers, Shiftbosses and Miners with regards to physical environment.

The results of the p values in the Multiple Comparisons Post Hoc test statistical analysis in the study (see Table 4-89) indicate a statistically significant difference between Managers and Miners.

The results that no statistically significant differences exist between Managers and Shiftbosses as well as Shiftbosses and Miners leads to the conclusion that the observable safety dimensions are not experienced integratively below shiftboss level.

Based on the findings of this study, sub-hypothesis 1.7 is therefore rejected.

An empirical study by Walker and Hutton (2006) confirm the responsibility of leadership for a safe physical environment, which supports the findings of this study.

5.4.2.3.5 Safety intent
Sub-hypothesis 1.8 postulated that there is no statistically significant difference between Managers, Shiftbosses and Miners with regards to safety intent.

The results of the p values in the Multiple Comparisons Post Hoc test statistical analysis in the study (see Table 4-98) indicate a statistically significant difference between Managers and Miners.

The results that there are no statistically significant differences between Managers and Shiftbosses as well as Shiftbosses and Miners leads to the conclusion that the perceived responsibility and supportive relationships of management that enhances safety intent have not been established beneath the shiftboss level.

Based on the findings of this study, sub-hypothesis 1.8 is therefore rejected.

Three empirical studies support the findings of this study:

- An empirical study by Erdem and Ozen (2003) found that high levels of trust amongst team members contributed to improved performance.
- A study by Wills, Watson and Biggs (2006) found the extent to which Management provided support to employees was a contributor to safe performance.
- Michael, Evans, Jansen and Haight (2005) empirically established a negative relationship between managements’ commitment to safety and withdrawal behaviours by employees.

5.4.3 Originating levels pertaining to the differences in the safe mindset of leaders

The key empirical findings discussed in point 5.2 above are summarized in Table 5-1 as follows:

<table>
<thead>
<tr>
<th>Safe Mindset, Constructs and sub-constructs</th>
<th>Originating level in organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>sub - constructs</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---</td>
</tr>
<tr>
<td><strong>Level One</strong> SHMI</td>
<td>Shiftboss</td>
</tr>
<tr>
<td>↓</td>
<td></td>
</tr>
<tr>
<td><strong>Level Two</strong> Relationship credibility</td>
<td>Shiftboss</td>
</tr>
<tr>
<td>↓</td>
<td></td>
</tr>
<tr>
<td>Climate</td>
<td>Manager</td>
</tr>
<tr>
<td>Culture</td>
<td>No statistically significant differences however improvements originate at Manager level</td>
</tr>
<tr>
<td><strong>Level Three</strong></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>Manager</td>
</tr>
<tr>
<td>Caring support</td>
<td>Shiftboss</td>
</tr>
<tr>
<td>Ownership</td>
<td>Shiftboss</td>
</tr>
<tr>
<td>Physical environment</td>
<td>Shiftboss</td>
</tr>
<tr>
<td>Safety intent</td>
<td>Shiftboss</td>
</tr>
</tbody>
</table>

**5.4.3.1 The improvement area for Managers are:**
- Climate
- Trust

**5.4.3.2 The improvement areas for Shiftbosses are:**
- Relationship credibility
- Caring support
- Ownership
- Physical environment and
- Safety intent

**5.4.4 Conclusion: Phase Two**
The results of the variances applied statistical procedures were analysed and reported per sub hypothesis. The relevant literature supports the results of the study with regards to level two and three analysis. No support in the relevant literature could be found for the level one analysis. The results of the study indicated that
significant differences between the three leader levels existed within the three levels of analysis with the exception of culture.

The implication of the results of the study is that significant differences between Managers, Shiftbosses and Miners existed with regards to their overall safe mindset (safety motivational intent). With the exception of Culture (no significant differences between the three leader levels), Climate and Trust (originating at Managerial level), Relationship Credibility, Caring Support, Ownership, Physical Environment and Safety Intent all originated at Shiftboss level.

5.5 Conclusion

In this Chapter the results of the statistical procedures were analysed, incorporated and discussed with the aim of explaining the Safe Human Mindset of the three leader levels in an underground mining production organisation.

The results of the analysis indicate the following:

- The Safe Human (Mindset) Model provides a sound theoretical and management model which, when applied, suggests focus areas from which interventions can be planned and executed. The model is a diagnostic instrument that assists in managing safety either re-actively or pro-actively in eliminating incidents and fatalities.

- The SHMI is both valid and reliable for application in an occupational safety risk environment. The results of the analysis also indicate that the empirical objectives of the study have been realised.

- With the exception of Culture (where no significant differences exist between Managers, Shiftbosses and Miners), the differences in Climate and Trust originated at Managerial level. Relationship credibility, Caring support, Ownership, Physical environment and Safety intent originated at Shiftboss level.

- With the exception of the two dimensions at Managerial level (Climate and Trust), the conclusion can be made that the Shiftboss level acts as a filter between Management and the lower levels (Miners) in the organisation. The result is disconnect to the organisation and has dire
consequences for communication lower down the hierarchy, teambuilding and participation in health and safety matters.

Chapter 6 follows and concentrates on the closure of the study by presenting recommendations, the value and limitations of the study as well as suggestions for possible future research opportunities.
Chapter 6

Conclusions and Recommendations

Great things are not done by impulse,
but by a series of small things
brought together

- Vincent Van Gogh
CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The previous Chapter addressed the results obtained from the empirical research conducted.

The findings of the study and the rejection of the integrative Hypotheses H1 formulated in Chapter 1 were discussed respectively.

The results and findings were obtained through the application of the Safe Human Mindset Measuring Instrument that measured the various constructs of the Safe Human Mindset Model in Figure 6-1 (repeated below):

![Figure 6-1: The Safe Human Model (Source: Schutte, 1998)](image)

Figure 6-1: The Safe Human Model (Source: Schutte, 1998)

In this Chapter a brief overview of the study, the summarised key findings of the study with recommendations are discussed. The value and limitations of the study
together with possible future research opportunities emanating from the study, will be discussed in conclusion.

6.2 A brief overview of the study

A summary of the sequence of chapters is provided in Figure 6-2 below:

![Chapter process sequence diagram]

**Figure 6 – 2: Chapter process sequence**

**Chapter 1**
The purpose of the study was to establish the safety motivational mindset (intent) of Managers, Shiftbosses and Miners on a platinum mine in South Africa. A brief overview of the background to the study and relevant literature was provided and subsequently an integrative hypothesis was formulated.

The integrative hypothesis (H1) stated that there was no statistical difference between the safety motivational mindset (intent) of Managers, Miners and Shiftbosses.
The objectives of the study were divided into literary and empirical objectives. Primary and secondary objectives were formulated thereafter. Both primary and secondary study objectives as well as the hypothesis were grounded on the application of the empirical research instrument (60 statement Likert-type SHMI) that measures the various constructs of the Safe Human Mindset Model.

Chapter 2
Chapter 2 addressed the literature review in terms of the world-class organisation as well as the theoretical foundation of the Safe Human Mindset Model.

2.2 The World-Class organisation.
The model of the 'world-class' organisation was theoretically discussed with detailed emphasis on leadership, joint governance and business results respectively. A contemporary focus on the study of leadership (1999 onwards) was included since the introduction of the original World - Class Model in 1999.

Within business results, competitiveness (organisational image) was expanded to include Corporate Governance and Business Ethics (developments subsequent to 1999) that were not included in the original World - Class Model in 1999.

Specific aspects of the World - Class Model for example leadership, customer centred strategy, aspects of joint governance, culture and costs (business results) where applicable, were discussed from an organisational (occupational) health and safety perspective.

2.3 The Safe Human Mindset Model
The Safe Human Mindset Model was discussed from a theoretical perspective. This study is based on the model and the Safe Human Mindset Measuring Instrument (SHMI) is a 60 - item Likert - type quantitative survey developed to measure the various constructs of the Safe Human Mindset Model.

Chapter 3
The purpose of chapter 3 was to design and define the research methodology that would be applied to the study at hand.
A quantitative research approach was followed and the application of the SHMI (60 item Likert – type quantitative survey) was applied to generate primary data.

The applied statistical processes (descriptive statistics) for validity and reliability and comparison of group results (inferential statistics) were described that would ultimately be used to accept or reject the stated hypotheses. The method for statistically processing data was also stated.

**Chapter 4**
The objective of chapter 4 was to describe and discuss the obtained research findings.

A two - phased approach was used to present the empirical study results. The first phase explained the descriptive statistical results and phase two the applied inferential and Multiple Comparisons Post Hoc tests results.

In terms of test validity and reliability the Cronbach coefficient alpha, frequency distribution, mean, median, standard deviations and communality were calculated from the data collected from the two target populations. Overall the scales yielded acceptable Cronbach coefficient alpha values >.7 and average communalities >.5.

The data for the three organisational levels were grouped, tabled and reproduced according to the procedures described above.

The first level of analysis focused on the SHMI results for the three production leader levels. The second level of analysis centred on the three main constructs of the Safe Human Mindset Model measured by the SHMI. The third level of analysis concentrated on five sub-constructs of two of the three main constructs (relationship credibility and climate) which yielded acceptable Cronbach - Coefficient Alpha values. The sub-construct of the main construct of culture was not subjected to further statistical analysis as a result of sub-hypothesis 1.4 being accepted.

**Chapter 5**
The objective for chapter 5 was to discuss the results of the study. The results were addressed according to the two phased approach discussed above. The various results for reliability and validity were summarised and discussed.

The empirical results obtained support the rejection of Hypothesis H 01 and the sub-hypotheses H1.1 – H1.2 and H1.4 - H1.8.

Sub-hypothesis H1.3 was accepted as discussed above.

6.3 Key findings of this research study

The key findings of the research study indicate the following:

- The primary objective of the study has been achieved. The rejection of the integrative Hypothesis H01 indicates that the safety motivational mindset (intent) of Managers, Shiftbosses and Miners differ statistically significantly with the exception of culture (sub-hypothesis H1.3).
- The development of credible relationships comprising of trust, caring support, respect and ownership, influencing of attitudes towards the job and organisation and cultivating a values and belief system falls within the ambit of leadership development that is required at the identified organisational levels.
- The construct of climate and sub-construct of trust originated at Manager level.
- The differences in the overall safe mindset, the construct of relationship credibility and sub-constructs of caring support, ownership, physical environment and safety intent originated at Shiftboss level.
- The results of the study also achieved the stated secondary objectives.
- The results will be utilised to recommend interventions. This will be discussed in the section that follows.
- The assumption can be made that diversity could play a role in the safety motivational mindset of Shiftbosses and Miners. The Shiftbosses were traditionally white and the Miners predominantly black. The impact was not addressed in this study but may lead to further research in this regard.
- Values and beliefs
Although the construct of self-care in safety (independence) is well developed, this poses a challenge to move to a desired interdependent (brother’s keepers mentality) culture

6.3.1 Action Research as an Organisational Development Process.

The identified areas for development refer to people, (credible relationship), processes (work environment) and systems development, which require a focused organisational development process.

French and Bell Junior (1999) propose an action research process to organisational development.

Action research according to French et al (1999) is a process of systematically collecting research data about an ongoing system with some objectives and goals performing to the system, feeding the data back into the system, and taking action based on the data and hypothesis and evaluating the results of the actions through more data collection.

Figure 6-3 below explains action research as an Organisational Development intervention.
French et al. (1999) argue that action research is an approach to solving problems as well as comprising of a sequence of events and activities (collecting data, feedback and taking action) based on the gathered data. They also assert that the desired outcomes of the action research approach are solutions to immediate problems whilst contributing to scientific knowledge and theory.

Coetzee (2006) states action research focuses on planned change as a cyclical process where the initial research within the organisation and the intended change provide information to guide subsequent action. The results of the action taken are then evaluated and analysed which lead to further action creating a constant cycle of change.

The action research model postulates eight main steps (French et al. 1999):
- Problem identification
- Consultation with a behavioural expert

Figure 6 – 3: Action Research Organisational Development Model (Source: French and Bell, 1999)
• Data gathering and preliminary diagnosis
• Feedback to stakeholders
• Joint diagnosis of the problem
• Joint action planning
• Action and
• Data gathering after the action and providing feedback to stakeholders possibly lead to re – diagnosis of the problem and new actions.

The key activity in Action research is Joint Action Planning where all parties that contributed to the research together with outside parties (consultants and or Unions and Associations) together disseminate the research results and jointly decide on courses of action, interventions and future steps. In a climate that is not conducive to open discussion in teams, the Nominal Group Technique as a method for eliciting responses may well be applicable.

6.4 Recommendations

The recommendations proposed are based on a theoretical, methodological and practical approach.

6.4.1 Recommendations in terms of theory

It was discussed that up to 87% of all occupational injuries are due to the human factor.

In the absence of theory on human error, standard rules and regulations that regulate occupational safety, adequate and acceptable behaviour from individuals, the articulation of normal behaviour and the prevalence of planned and unplanned actions all define a behaviour approach to safety improvement.

The aspects of attitudes resulting in and influencing behaviour was discussed in Chapter 2. Attitudes not only influence behaviour, but behaviour is also influenced by attitudes (reciprocal relationship). The theory of cognitive dissonance and self-perception supports this phenomenon.
The A→B→C theory of behaviour is based on the stimulus-response theory and uses organisational behaviour modification (OBMOD) techniques to change behaviour. The foundation according to Sutherland et al (2000) is that behaviour is determined by its consequences (discussed in Chapter 2). The elaboration by Smith (2002) from the basic A→B→C model to A→B→C→D→E→F completes the behaviour cycle approach that utilizes rewards as method of reinforcement of behaviour. The D represents the dispute of behaviour, E represents the engaging into new behaviour and F represents the consequences of the new behaviour.

Rewards should be directed at reporting of incidents and not injury free periods. This would assist information being generated that could assist in eliminating incidents in total. This supports a belief system (culture) of zero injuries and incidents. The behaviour approach to safety improvement originates from behaviourist theory that reasons actions are determined by it consequences (the A-B-C theory of behaviour) according to Sutherland et al (2000).

The accident iceberg and accident behaviour process and cycle was discussed in Chapter 2 under the section on leadership and change.

It is recommended that the A-B-C of behaviour and subsequent A→B→C→D→E→F process need to be incorporated into leadership development on both the intra-personal and inter-personal levels. A planned change process is proposed, taking cognisance of the barriers to change (Coetzee, 2006). Sutherland et al (2000) also propose a managed change process through pioneering, differentiation and eventually integration.

O’Dea et al (2003) postulate the attitudes of senior managers influenced the attitudes of middle management and by focusing on changing attitudes the climate can be changed quicker than culture which is longer enduring. Clark et al (2002) empirically found that a relationship existed between climate and employee compliance to and participation in safety. An attitude of zero tolerance to non-compliance and the involvement of employees and safety representatives underground in half-level meetings can ensure participation, which can assist in changing the climate on the short term.
6.4.2 Recommendation in terms of methodology

- Schutte (1998) reasons that behaviour is at the heart of successful transformation and change. He proposes a transformation process through honest, ongoing involvement that would transform individuals and the organisation from within.

- A high involvement leadership, shared vision, mission and values as well as a supportive safety-conscious culture underlie this process displayed in figure 6-4 below.

![Diagram showing the Employee-Safety Growth Chain]

Figure 6 – 4: The Employee-Safety Growth Chain (Source: Schutte, 2004)

Schutte (2004) reasons that ongoing involvement through a behaviour based approach will affect transformation.

- Since leadership is an inside-out approach, a three - phased process with regards to leadership development is proposed.
The first phase is the inside-out approach and focus on the intrapersonal level (developed by Smith, 2002).

The second phase of leadership development focuses on the interpersonal level and the care and growth process (developed by Schuitema, 2004) is proposed. The care and growth process results in legitimate leadership that has significant benefits from both employee development and an employment relation perspective.

The supportive 360°-evaluation process to leadership development is proposed.

The third phase of leadership development focuses on business leadership skills development.

- Since the abovementioned interventions impact on the organisation, a planned, structured approach to organisational development is proposed (the action research model discussed above is proposed).

**6.4.2.1** Action research as on Organisational Development Methodology (discussed above) is primarily a research process where data is scientifically gathered in terms of an identified goal(s) and this data is fed back into the system, taking required actions and evaluating the results of the actions taken.

- Since Action Research is a continuous process and not based on ad hoc interventions, a continuous improvement strategy is proposed by Schutte (1998) to transform the organisation into an involvement organisation.

Figure 6-5 below explains the four phases of a continuous improvement strategy.
• Involving employees meaningfully on the individual level in job and safety related matters will, according to Schutte (2004) reinforce a risk-minimizing employee attitude and improve safety behaviour. Equipping employees with critical risk-management skills through an understanding of the interrelationship between risk and safety is explained in Figure 6-6 below.

<table>
<thead>
<tr>
<th>RISK</th>
<th>SAFETY</th>
</tr>
</thead>
<tbody>
<tr>
<td>We continually recall and evaluate our life experiences in order to create:</td>
<td>We continually test and evaluate other peoples' responses to our actions</td>
</tr>
<tr>
<td>Mindset pictures of what we expect may result from an action or omission</td>
<td>We modify our behaviour in accordance with the value that we attach to the risk</td>
</tr>
</tbody>
</table>

THE FOCUS IS ON THE DEVELOPMENT OF A RISK MINIMISING ATTITUDE.  
THE FOCUS IS ON THE DEVELOPMENT OF SAFETY IMPROVEMENT ACTIONS

Figure 6 – 6: The interrelationship between risk and safety (Source: Schutte, 2004)

It has been stated that of all leadership skills, coaching is utilised the least, and it is proposed that leaders at the various levels are equipped with coaching skills that include demonstration of complex tasks, advice and instruction in such ways that would empower employees and reinforce trust, respect, dignity and ownership. This would enhance interpersonal relationships as well.
The mentoring process could also be enhanced in this manner. Included in coaching skills are correcting behaviour, negotiation (arbitrate between conflicting viewpoints, contract for safe performance and conflict resolution) skills, problem solving and decision-making skills (fault finding and resolution) and reward skills (identify, praise and reward safe performance). The aspect of management treatment is enhanced in this process.

A specific communication and participation intervention with the Shiftboss level is proposed that would assist in breaking the current barrier experienced at this level through the application of the action research process.

- On group (team) level it is proposed to develop production teams through experiential learning processes (team development through the four improvement phases) and activities to manage risks in team relations, develop an interdependent work culture and conduct problem solving and decision-making in teams (groupthink). The leadership of groups or teams need to be equipped simultaneously with the skills to lead teams to manage risks, develop interdependence and groupthink (creative scope).

- A reward and recognition system needs to be designed and implemented that will complement safe behaviour.

- Exposing leaders to emotional intelligence concepts and skills will enhance credible relationships, which is a factor in a behaviour based safety coaching (Wiegand, 2007).

- A project management approach is proposed through implanting the four-phased approach.

6.4.3 Recommendations in terms of practice.

It has been recommended that a behaviour-based approach to safety improvement be introduced that will include employee involvement. The following practical recommendations are proposed over the short term whereas the theoretical and methodological recommendations are from a relative medium to long-term perspective. These are 'quick wins' that can be established over the short term:

- In terms of management (leadership) practice the identified areas for development were trust, respects, ownership and caring support.
• Trust
Since the various leader levels visit underground workings on a continuous basis, involving employees, allowing (directing) viewpoints, providing honest feedback, sincere interactions with people (greet, show care, don't hide the truth) are all behaviours that will foster trust.

• Respect
- Treat people with dignity, listen attentively to what they have to say and never degrade attempts employees make. Leaders can easily demonstrate this daily by practicing.
- Be approachable by being visible in the work place, talk to people, ask for their ideas or opinions.
- Use visits underground to connect employees, jobs and organisational strategy – how they fit in and contribute.
- Always be confidential. If entrusted with information, never share it.
- Helpfulness with a difficult task strengthens respect.
- Thank people for a job well done.
- Praise good performance.

• Ownership
- Share information with truth.
- Developing employees' capability (coaching, mentoring – short to medium term) and support (backing) employees.

• Physical work environment
- Communicate results of safety indicators with employees.
- Apply zero tolerance continuously when visiting working areas with regards to use of personal protective equipment, safety housekeeping (cleanliness, orderliness) standards and procedures.
- Conduct weekly safety meetings and share other incidents with employees.
- Reward (award) safe working practices on the spot.
• Safety intent
  - Treat people as valued employees.
  - Involve them in safety matters.
  - Conduct problem-solving sessions in teams.

• Culture
  - Apply fair treatment for non-adherence to safety standards.
  - Fair treatment for at risk behaviour (always within the organisational disciplinary code)
  - Enforce zero defect / zero tolerance.

The above are all identified behaviours that could ensure 'quick wins' and are short – to medium term solutions by nature, whilst the theoretical and methodological recommendations are implemented. These behaviours had to be integrated into the various leader development training programmes.

6.5 The value contribution of the study

- The study elicits the factors that influence and contribute to the safe mindset of the Manager, Shiftboss and Miner leader levels in the organisation.
- The study identifies the areas for development of the three leader levels in the organisation to progress to world-class organisation status.

The value of the study is presented in terms of the contribution made from a theoretical, methodological and practical perspective.

6.5.1 Theoretical contribution

As a result of the comprehensive literature review, it is proposed that the World-Class Organisation Model include the following three aspects:

- The world-class model has been updated to include contemporary aspects in the study of leadership (after the introduction of the world-class model in 1999) for example personal and professional leadership (intrapersonal) as well as interpersonal leadership (caring and growing of people).
Within business results of the World-Class Organisation Model, Corporate Governance and Business Ethics are proposed for inclusion (enhancing) organisational image (both are developments subsequent to 1999 when the World-Class Model was initially introduced).

6.5.2 Methodological contribution

It is recommended that:

- The behaviour-based approach to safety be adopted and the required leadership skills at the various levels in the organisation be introduced. This entails equipping the various leadership levels and the teams with the skills to progress to an interdependent work culture.
- A structured approach to organisation development to be introduced using the action research process to address the barriers identified at the Shiftboss level.
- Leadership development to be conducted in a three-phased approach on the intrapersonal, interpersonal, and business skills development level.
- Behaviour based safety coaching for leaders are to be introduced.
- Risk management skills in leader levels as well as in production teams are to be established.
- Structured team development is promoted through experiential learning that would empower teams and enable growth to mission directed work teams.
- Recognition and reward systems that would recognise performance are to be introduced.
- The Performance Management System to be adapted to include identified behaviours into outputs in Individual Performance Assessments and Individual Development Charters for all identified leader levels.
- Structured interventions be identified and implemented at Managerial and Shiftboss level to transform the organisation to world-class status using the study results as basic diagnostics.

6.5.3 Practical contribution
• The application of the Safe Human Mindset Index at structured intervals to monitor progress towards world-class status and diagnostic for organisational development interventions.
• Enhance values and beliefs (culture) through behaviour modification interventions.
• Identified behaviours through leader and team development to address identified employment relations, organisational climate and culture development needs.
• Improvement of Employment Relations on the shop floor through the implementation of identified interventions.
• The improvement of the Safe Human Mindset (safety motivational intent) of the workforce will have positive safety, production and financial (revenue) implications for the organisation.
• Although inherently a people focused approach, the associated processes and systems applicable to safe production can be identified and developed that would assist in achieving zero incidents and injuries thereby improving productivity and increasing revenue.
• Applied in total organisational context, the application of the study may assist corporate management to identify and implement relevant policies as well as interventions for employee development, employment relations as well as occupational health and safety practices that would ultimately ensure that the organisation is developed through a structured approach.

It is evident from the study that aspects of employment relation practices impacted on the safe mindset of employees. Possible synergies between Human Resources practitioners and Health and Safety professionals needed to be explored specifically in the behaviour based safety and safety coaching spheres.

6.6 Limitations of the study

The following limitations need to be considered in this study:
• The study was conducted on a single mine which is part of a group of mines in a mining company.
• The influence and interrelation between corporate structures and mines with regards to Health and Safety have not been addressed.
Due to the nature of this study, no other organisational variables for example employee commitment, the psychosocial contract in the workplace, transformation (equity) or empowerment as possible independent variables were included in this study.

Since the three leader levels as groups in the organisation were studied and not the direct reporting lines or teams reporting to these leaders, a more comprehensive study of the Safe Human Mindset was not undertaken.

The impacts of legislation, for example the Mine Health and Safety Act and Regulations 29 of 1996 and Minerals and Petroleum Resources Development Act and Regulations 28 of 2002 were excluded from this study as a possible influence on the Safe Human Mindset of employees.

The safe mindset of production teams and their leaders were not included in this study due to:

- The size and focus on the three leader levels and
- The initial acceptance of the principal that leaders influence followers towards goal achievement.

As a result of these identified limitations to the study conducted on the mine the suggestions for future research are addressed next.

6.7 Suggestions for future research

The following suggestions for future research emanate from this study:

- The interrelation between Corporate Head Office and mine(s) with regards to Health and Safety and a Safe Human Mindset.
- The effectiveness of organisational Health and Safety Strategy to identify pitfalls and developmental aspects in organisational context.
- The Safe Human Mindset of leaders and workers to gain a broader picture of Safe Human Mindset in an organisation in individual or team context.
- The aspects of diversity that influence the safe mindset of employees or subordinates.
- The barriers to organisational Health and Safety Strategy to effectively implement an Occupational Health and Safety Strategy in organisational context.
The impact of leadership and joint governance in the conflict of interest between production and safety.

The psychosocial contract as departure point for managing Organisational Health and Safety through values.

Values driven Health and Safety leadership can contribute to instil a safety culture.

The introduction of Broad Based Black Economic Empowerment, Employment Equity or Women in Mining (Mining Charter requirements-legislation) impacting on Occupational Health and Safety. This is also linked to diversity and transformation. A diverse workforce and transformation future will result in a broadening of organisational culture (values and beliefs).

The impact of relevant legislation on the Safe Human Mindset of employees.

6.8 Conclusion

In this Chapter a brief overview of the study, the summarised key findings as well as recommendations were provided. The value and limitations of the study with possible future research opportunities emanating from the study were also discussed.

The study of the human factor in Occupation Health and Safety is a relatively new field of research.

The application of this study on a mine defined at Manager, Shiftboss and Miner levels (the three leader levels) has nomothetic value for organizations that are subject to high risk from a health and safety perspective. A broader application to include the Corporate environment and sister mines would contribute to a broader understanding of the Safe Human Mindset (safety intent) as well as a measure of the state of emotional intelligence in the organisation.

The findings of the study however have theoretical, methodological and practical value. Since a behaviour - based safety improvement process is proposed, the development of leaders and teams through a structured Organisational Development
process over the longer term as well as the introduction of ‘quick wins’ in practice can result in improved health and safety, productivity and revenue.

The application of the Safe Human Mindset model and measuring instrument is a scientific process that elicits the features of quality safe production from a people (human) perspective. The model as a diagnostic instrument assists the organisation to develop safe production in a structured manner to quality.

A final review of the study indicates that the literature and empirical study objectives set at the beginning of the study were achieved.
List of References


Labour and Mining Headlines. (2007). South Africa no magnet for talent, and little better at nurturing it. Labour and Management Headlines. 10 October.


Smith, D. P. J. (2002). Personal and Professional Leadership. 12 Hour Professional Leadership Workshop for Anglo Platinum. DPJS@edcur.rau.ac.za.


The University of Iowa. (2005). Focus on five key skills to improve communication skills. http://www.uiiousa.edu/.


Federal Aviation Administration. Atlantic City International Airport. N. J. June.


Wilson, R. (2005). Spiralling and Out of Control: 5 ways to Reduce Workers

Windrum, P. and de Berranger, P. (2003). Factors affecting the adoption of intranets
and extranets by SME's: a U.K. study. International Institute of Infonomics and Merit-
Maastricht Economic Research Institute and Innovation and Technology.


intelligence on performance and attitude. An exploratory study. Science Direct. The


Prentice Hall.


Review.January