

A holistic management model for the transformation of high technology engineering companies for sustained value creation and global competitiveness

by

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“A HOLISTIC MANAGEMENT MODEL FOR THE TRANSFORMATION OF HIGH TECH ENGINEERING COMPANIES FOR SUSTAINED VALUE CREATION AND GLOBAL COMPETITIVENESS ”

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SYNOPSIS:

The key objective of this thesis is clearly stated in its comprehensive title. In today's fast moving, turbulent and highly competitive world, high tech companies and engineering-based organizations struggle possibly more than other businesses with the seemingly irrational, analogical events when most people in such organizations are rational, highly analytical persons.

Value creation is one of the key objectives of modern high tech companies. Hence, the achievement of this ideal within the constraints and consideration of a myriad of factors requires a different approach and implies an ongoing transformation process which is not always based on rational aspects alone. If such a transformation is to be sustainable and takes place in a globally competitive framework, the approach has to be holistic and it has to consider many additional factors which tend to be considered as soft in the analytical world of high tech.

The thesis formulates a management and leadership model which includes both the soft and hard factors in a comprehensive and collaborative manner. The model lends itself to understand and judiciously manipulate the dynamics of the high tech global business environment for sustained competitive advantage. The model recognizes and enables the manager and leader to address the many issues confronting them daily by giving a new strategic perspective with the help of sub-models. These sub-models form the anchors whereby a complex situation can be managed reasonably, effectively and hopefully wisely too.

The suggested model is to a large degree independent of time and industry-space and is considered valid for a long time to come. Although aimed at providing a guideline at executive level of management in the high tech environment the suggested model is by no means limited to engineering nor is it limited to high tech companies. The framework and model anchors developed, are equally valid in other complexity-prone industries as can be confirmed by the author's wide international practical experience in a number of industries, from Banking, Service provides, Health Systems, e-commerce, Petro-Chemical and others.

Acknowledgements

In one sense it was a privilege and a pleasure to at last put on paper the model that I had found to be a successful approach to management and leadership tasks in the high technology environment. As a practicing engineer with many years of practical management experience in the high tech world, I had, in an evolutionary trial and error process, found a way of dealing with complex issues, processes and people in an environment which is highly structured, analytical and also very fact-driven. It left no room for the apparent “messiness and fickleness” of real life with its paradox and inconsistencies I was faced with daily.

In the end I had to find ways to achieve value creation in a highly analytical, structured and dynamic environment. This in turn required looking at managing changes, managing the organisation's knowledge, managing the future, managing innovation and creativity to benefit the organisation's global competitiveness and still creating value for a host of stakeholders. Furthermore, it required looking at my assumed talents, skills and needs critically, practicing self-management and acquiring new skills and competencies to juggle “100 balls in the air and yet to focus on the one in-hand” for the moment. It taught me things that, as a technically minded person I was at once awed and surprised to learn about.

It was a great privilege to learn from the literally hundreds and perhaps thousands of interactions, discussions and contributions during my 15 year long corporate career and 15 years of facilitating international workshops and seminars in different cultures in three different languages on four continents. The unique exposure to such differentiated cultural thinking and doing in the business context provides the backdrop to this management model and gives it real-life colour.

My appreciation and gratefulness is to those uncounted contributors in my professional life over the past three decades that I owe my insight and understanding about business life in general and the gradual development of the here presented business management model in particular. There are of course many persons to acknowledge and it is impossible to mention all those who contributed to my own understanding and insight.

On the other hand, the formulation of so messy and fuzzy a model, challenged my powers of articulation and expression greatly and I strained many times with my personally held perspective of insufficiency of imprinting my implicit knowledge, experiential and factual, explicitly onto paper. You be the judge if I succeeded even marginally.

A special word of thanks and appreciation must go to the following persons:

- My best friend and first-wife Suzannie who thought I was married to my laptop while “almost finished with my thesis” for the last two years.
- The kids, Ute, René and Judi who saw so little of me while I was travelling the world to collect all the relevant experience for this model.
- My promoter Prof Leon Pretorius who was incredibly patient with my continuously delayed hand-in dates and who, his own personal structured approach notwithstanding, was courageous enough to let his protégé tackle such a challenging topic in an unconventional but hopefully exciting manner. Our many discussions and letting me share my ideas with his Master Degree Engineering students in lectures also showed intuitive understanding and considerable boldness on his part. I trust some good came of it for the students too.
- Above all, my Lord who was and is my Shepherd in this task and in all my ways and who enabled me to complete this project step by slow step, although I could have worked in His vineyard instead.

In total: the privilege was greater than the strain – Therefore, THANK YOU ALL who find the one or other highlight in this thesis where they contributed during a discussion that remains unacknowledged because I don't remember who and when and where.

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DIETMAR H WINZKER



CHAPTER 1

PREAMBLE

1. INTRODUCTION AND SCOPE OF THE RESEARCH

“The Twentieth Century is the name of a train that no longer runs”
David Lehman¹

1.1 BACKGROUND AND INTRODUCTION

The author of this thesis can look back to a satisfying career in the challenging and dynamic high tech environment, where he was exposed over 15 years to multi-disciplinary complex engineering systems in a technical capacity as well as member of top-management. The author would like to assume that he has an appreciation and some understanding of the enormous challenges faced by such organizations.

Subsequently, the author spent another 15 years conducting international consulting assignments and facilitating workshops in the high tech environment where he was able to look in some depth into a variety of large and medium size companies embedded in different national cultures.

From such a privileged position the author discerned the need that most high-technology companies require a conceptually wide-ranging but still pragmatic business leadership and management model to meet the conflicting demands of globalization, creating shareholder value, retaining and expanding the knowledge base and to satisfy international markets competitively. The challenges and problems encountered when placing the organization into a futuristic framework (i.e. a vision for the future) demands *flexible strategic intent* rather than *rigid strategic planning*. Indeed, the challenges and problems when the organisation and its environment are recognised as an open interdependent dynamic system cannot be effectively managed other than with a completely holistic approach, if sustained growth in the turbulent post-millennium business environment is required.

¹ *The Answering Stranger*, Princeton University Press, 1990

The expression holistic implies a truly wide range of issues, aspects, factors and disciplines as well as their interactions and interdependencies, all bundled together. These must be considered concurrently in a practical, real life business situation and this poses considerable and varied challenges in any contemporary business, not just in the high-tech environment.

It is especially noticeable, that in the contemporary, digital, turbulent business environment, with the large quantity of available information and the enormous time pressure exerted, decisions are made in a manner that is not always very rational yet still very often leads to superior solutions. How can this be? - Especially when seen in the light of technically trained people's acclaimed rationality.

In his book *Against the Gods - The Story of Risk*, Bernstein [228] expresses that sentiment well when he states: "*The prevalence of surprise in the world of business is evidence that uncertainty is more likely to prevail than mathematical probability*". This of course, flies into the face of technically and scientifically trained people like engineers.

Thinking in terms of relations between issues and disciplines instead of factual detail and attributes embedded in or attached to objects causes considerable problems. During school and (especially) during higher education the prevailing approach is to view issues and objects separately and distinct. Conventional teaching focuses on classifying everything according to its basic constituency and the tendency is to articulate a classification universe instead of, or concurrent with, a relational universe. The critical importance of relational aspects in the high tech enterprise has a surprisingly high recognition value but as observed by the author, seldom executed effectively and consistently.

During the international consulting exposure the author noted that some progressive companies have already shown what level of the thesis-title attributes can actually be achieved although they may not have a formal model to go with it. Usually it is not sustainable in the longer term for that very reason. Such companies tend to manage largely on intuition by the leadership, either collectively or as found in the head of the

organisation. This is borne out in contemporary business and management literature such as the Harvard Business Review, Fast Company, Strategy and Business and books by Tom Peters [309], Charles Handy [112] [113] [202], Seth Godin [303], Bill Hybel [292], Richard Pascale [301] and Jonathan Low [305] to mention but a few.

The author himself has over many years attempted to follow the guidelines provided by this thesis albeit in a non-formalised form and hence by its very nature un-documented and incomplete. This thesis is an attempt to close that gap.

1.2 CONTEMPORARY BUSINESS REALITY AND ITS IMPACT ON THE THESIS RESEARCH

The multi-disciplinary, vacillating nature of the post-modern high-tech business environment, the simultaneous impact of a multiplicity of critical issues and the influence of an ever-increasing number of stakeholders' priorities and diverse interests, cause consternation, if not outright bewilderment. All these considerations and many more have to be handled judiciously if the organization is to be continuously transformed when adjusting to the ever-changing circumstances and the opportunities this poses.



The ensuing openended-ness of most decision-making processes under such conditions lacks the conclusive certainty that is expected in highly structured and analytically formatted company cultures such as may be found in high tech companies. [<http://www.fastcompany.com/magazine/18/one/html>]

The above statement alludes to one of the most critical aspects in the transformation of high tech companies:

- Most engineering problems are determinate with at least a reasonable if not high degree of certainty and in the end generally consist of *one best solution*.
- Business leadership and management issues however, consist of a number of equally valid options at a specific moment, the selection-consequence of which unfortunately is only apparent after considerable time delay, i.e. in hind-sight.

While the engineering function deals mainly with *problem-solving* often in the context of an optimized solution, the management and leadership domain requires *making choices* and managing the resultant complexity and risk. While both occur “under the same roof” in a high tech company, the conditions and culture, perspectives and attitudes, specific actions and expectations differ considerably and dramatically in these two broad functions.

Engineers will be engineers however, and with their analytical training and emphasis on precision, optimisation and efficiency when applied in a turbulent, paradoxical and unstable business environment will attempt to force a solution with a structural and analytical approach. Unfortunately under such conditions this is of limited value, due to the fluidity and general messiness of an organization *floating in the soup of real life*. Add to that the democratization of the business environment, the individual’s personal aspirations and access to information as well as increased global competitiveness and the complexity increases exponentially. In the author’s opinion, this is similar to attempting to catch a fluid with a sieve. Rather, pursuing this metaphor further, the fluid should be given a suitably pre-shaped container in which it is free to flow and take up the space available as the spatial conditions change. Indeed the container may have to be changed from time to time.



Using another engineering metaphor, the precise mathematical malleability of turbulent flow of a real-life object such as a projectile upon leaving the muzzle of a gun [317] or supersonic gas dynamics of the Space Shuttle during the transition from space to earth frustrate precise analysis in time and space, although the engineering models of course get better every day. The business environment of a high tech business is at least as intangible and unpredictable as turbulent unsteady flow in most cases. Turbulent unsteady flow phenomena generally must be of the most difficult problems to accurately determine and in analogy, it is similar with the wildly fluctuating and paradoxical contemporary business and economic environment.

Given the analogy and pictures above, how do high tech companies cope? In most cases the author notes, business life just goes on, often efficiently over longer periods of time but with effectiveness ever decreasing during that same interval. Technical work is based on reasonably long-term contracts and projects and proceeds in

reasonably well defined, hence predetermined milestones and activities in line with standards, specifications and defined single-point requirements.

But there are also more intangible aspects such as assumptions about

- the future,
- the competitors and other stakeholders,
- the market place,
- marketing approaches,
- the global economy,
- technology breakthroughs,
- the loyalty of key employees and suppliers,
- global events such as war and natural disasters,
- the shift of global public opinion as well as
- mergers and acquisitions

Day to day operations, with little conceptual insight of the larger overall objective of providing value to all stakeholders in a sustainable fashion continue in the spirit of “business as usual” with often disastrous consequences.

In today’s post-millennium era such an approach to managing a high tech organization is no longer viable and does not tangibly take into account the extreme competitiveness on a global scale, the needs and claims of the various stakeholders of the company and the requirement for sustained value creation to mention but a few factors at this stage. Such companies will not survive, or will at least be down-sized and down-graded until they become insignificant even if they do happen to still be around. An excellent local example is represented by a whole string of companies in the state-owned defence industry of South Africa.

The above clearly alludes to the following business reality: Today’s unsteady business environment such as encountered by high tech organisations, be it in terms of global factors, technology issues, economics and human aspirations calls for clear vision, meaningful value-anchors, boldness and courage, commitment to change, to

action and the display of wise yet humble leadership with exceptional mental maturity and flexibility rather than another 12-step program or 7-point recipe.

1.3 THE RESEARCH PROBLEM

The need is perceived that high-technology companies require a value-creating business leadership and management model which demands a completely holistic approach to achieve sustained growth in the contemporary turbulent post-millennium business environment and where the company and its environment is seen as an open system. Such a model must be able to incorporate soft and hard issues, strategic as well as operational aspects and be practical in the sense of implementation and sustainability.

Over the years of international consulting the author has been able to see selected segments of the research problem being addressed but over a relatively wide range of industries and disciplines. The selected segments would of course reflect the background and professional bias of managers and leaders of those specific industries.

It will be shown in Chapter 3 that in terms of available literature that was studied over many years, a similar picture emerges: Management models either exhibit a very rigid structure in terms of a prescribed roadmap, or follow a specific recipe and imply that these models are universally applicable. Often a reasonable scope of applicability is the case, but as it only addresses some aspects of the research problem it is too specific and contemporary.

When the proposed leadership and management model is applied to a large number of situations and unforeseeable conditions it cannot be exactly replicated for any two organisations, no matter how similar they might appear, just like two living organisms, even cloned ones, will not ever be exact copies of each other.

A truly wide range of issues, aspects, factors and disciplines have to be bundled together in the proposed model and these must be considered concurrently in a practical, real life business situation. It is especially noticeable that in the contemporary turbulent business environment, with the large volume of available information and the enormous time pressure exerted on organisations, decisions are made in a manner

that is not always very rational yet can still very often lead to superior solutions. How can this be? Especially in the light of our acclaimed rationality.

Thinking in terms of relations between issues and disciplines instead of just factual detail embedded in objects causes considerable problems. Conventionally this is taught at an early age at school as well as during higher education, namely to view issues and objects separately and distinct and not in a holistic, relational framework.

In engineering, the accepted teaching is to classify everything according to its basic constituency and to a large extent engineers continue to live in a *classification universe* instead of, or concurrent with, a *relational universe*. The author was able to learn over the years that the relational universe approach leads to much better decision-making and achieves a higher frequency of wise, hence judicious, outcomes than the classification universe approach.

Although engineers do observe an often a-causal behaviour between objects and issues in an interdependent open-system the tendency is to perceive those as a simple cause and effect relation.

This approach, however, can create more problems, than it apparently solves. There are integrating disciplines such as system engineering that will address the important virtual interactions on the technical plane, this type of system thinking is not generally applied in the process of strategic leadership and the management of the organisation. The breakthrough factors that finally provide in-sight and whole-sight in the business management area when everything rational has been considered, appear to be non-tangible and frustratingly fuzzy because they are relational and not easily handled with pure rationality thinking.

The provision of more information and data does not necessarily provide better insight when the relational aspects between even a few separate objects have not been understood. Although what goes under the term relational does not necessarily imply intuitive and intangible the brain seems to be ahead of our rational thinking in decision-making. Surprisingly, business and management decisions are often made on the basis of so-called gut-feel, hunch, insight or similar terms and even technical

information is often heavily filtered emotionally before it reaches the decision-making level.

The inclusion of intuitive and emotional processes seem to contradict accepted practices traditionally led by logic and “*ratio*”. Highly rational people, as found in the technology environment, will often write these intuitive factors off as sophistry and self-deception, yet it can be observed that they do themselves practice intuitive decision-making processes when all logic and rationality available will not suffice for a sound decision.

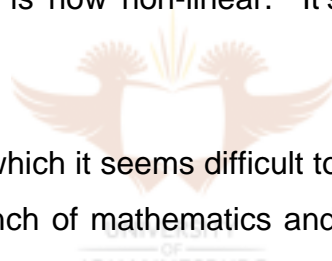
Back in 1738, the *Papers of the Imperial Academy of Sciences in St. Petersburg* carried an essay with this central theme: “the *value* of an item must not be based on its *price*, but rather on the *utility* that it yields.” Price is inherent value and objective, while utility is judged subjectively by the beholder. One of eight brilliant Bernoullis, mathematician Daniel Bernoulli recognized that, “*while the role of facts is to provide a single answer to expected value (the facts are the same for everyone), the subjective process will produce as many answers as there are human beings involved*”. [228]

Furthermore, it has been observed that the engineering environment is especially adept at defining and understanding processes as depicted in traditional block diagrams but that the arrows between blocks, which contain the relational aspects of the process, are seldom understood or managed in any conscious manner. In fact these relational aspects are often ignored or taken for granted in an intuitive way. Any business process analysis or merger between two companies shows this phenomenon very clearly. In the case of a merger, it seldom works.

These intuitive aspects, are part of our daily lives from the business office and factory to the service industry and this causes considerable debates and incredulity in a typical technology environment. Nevertheless it will be shown rationally and not just intuitively, that these softer factors play a leading role in all organisations and indeed all walks of life, whether recognised as such or not. Furthermore, they have to be completely integrated into the management model.

The difference between good rational decision making and wise decision making is due to a large part to intuitive processes. Intuitive processes are truly holistic in nature and are based on expertise (logic), experience (intuition and logic) and inspiration (intuition). It is the latter that causes most problems for a completely holistic approach to problem solving in the technology area, in that inspiration is....well just that. Not rational, not logical. Not black, not white, but rather some grey in between. Yet note, that there exist many more shades of grey than the two boundary values of black and white.

If one were to look for an accurate map, in the form of a well-defined, clear-cut process there would be disappointment. You can't create a map of terra incognita. You can't consult maps in a world where the *terra* is no longer *firma*. In the new world of the post-modern culture, with no familiar landmarks, you can only explore the new world for yourself. Post-modern culture is unmappable on flat surfaces. It cannot be reduced to two dimensions. Mapping is now non-linear. It's more like "a spider spinning a web". [246]



There is a kind of fuzzy logic which it seems difficult to get a practical handle on. Fuzzy logic is now an accepted branch of mathematics and control system engineering and will become more important in our handling of business management complexity too. In the recent decade the number of books, articles and journals trying to deal with this phenomenon has increased manifold, indeed has exploded. [114]

The proposed management and leadership model will invoke unusual approaches borrowed as it were from other disciplines, such as the life-sciences, fuzzy logic and fractal mathematics. Yet this dissertation is not a rigorous mathematical one, but rather the opposite as it attempts to get a deeper understanding on the intangible and more relational aspects of business life as it pertains to a high tech environment. This might create controversy in a technical / academic environment where the emphasis is on mathematical analysis and rationality.

The management and leadership model under consideration is by no means limited to the high-tech sector as its principles would be equally applicable in any contemporary business venture. The technology environment experiences the greater problem in this

regard however, with the overflow of “black-and-white-technology-think” into the relational, more grey real-world of business leadership and management.

Most people in high-tech can cope with complexity reasonably well, but not with unstructuredness and what seem to be inefficient processes. This thesis is based on the premise that when analysing the strategic level of a business, in the new era of profound interconnectivity, interdependence and kinetics *the unstructuredness of effective processes* has a higher initial priority and is more dominant in successful business organisations than *a highly structured, efficiency-focused process*.

Effectiveness thus precedes efficiency. It is not to say that such matters as financial astuteness, planning and budgeting or continuous operational efficiency improvements will fall away or even lose significance. Rather, it is the integration of these aspects in the greater picture that has to be considered, consisting of an increasingly large proportion of non-traditional soft components that are more effective than efficient.

From the comprehensive literature overview presented in Chapter 3 it is interesting to note how many business articles and management books written by well-known and credible authors, thinkers and business leaders published after 1990, have emphasized these relational, contradictory, fuzzy aspects –consciously or unconsciously – with various degrees of success. [113] [234] [246]. The reason being that although everything rational is being done to get a handle on these issues in terms of new management practices, there is always still something missing that appears to be critical.

The predominantly evolutionary process started slowly during the industrial revolution, accelerated with the need for mass production during the two world wars and which subsequently accelerated during the eighties and nineties of the last century. Typical MBA programs attempt to package the different disciplines and aspects of organizational life into bite-size chunks which lack meaningful, continuously evolving, relations.

Despite some excellent internationally recognised MBA programs in many developed countries and noble attempts by some high-caliber Universities to get to grips with the

complexity and fluidity of the business environment, there was and still is some critical component missing. The exactitude, structuredness and highly analytical approach, perhaps even the clarity of such programs miss the critical point of an evolutionary process: its messiness

This thesis elucidates that the missing component is indeed a multitude of partially intangible, yet real, factors that successful contemporary business organisations are able to integrate effectively. The missing component itself is an integrated collection of critical factors that have to be applied concurrently and flexibly depending on the particular situation. It also has much to do with the specific time period under consideration and its particular characteristics, as will be shown later.

For the moment consider the clear, if sometimes subjective, evidence relevant to the management of high tech companies:

- there appears to be the need for more tolerance for paradox, revolutionary innovation and instability in current business models;
- there appears to be an evolutionary component in the real business world that evades capture by rationality and logic;
- there appears to be a requirement and a concurrent need for freedom of original thinking and quick thinking at that;
- there appears to be a spontaneity that relies more on intuition than on a few selected facts alone;
- there appears to be an increase in the pace of just about everything: technology development, political and social factors, alliances and competition to name but a few. These factors have to be managed in a framework of paradox and ambiguity in real time which is still further compounded by enormous complexity.

A further important consideration is the iterative approach to the underlying management problem: In a sense the management model for the holistic transformation of high tech engineering companies is a circular affair rather than a linear process. One of the big challenges of this thesis is to convey the iterative nature of the management process which, as it progresses in time, must be depicted as a spiral rather than a circle due to the change in all the important environmental

parameters with time. Due to the spiral nature of the concept, even a cyclical consideration will never be at the same point twice as time moves on.

The research problem concerned with this admittedly hazy cloud of aspects and issues for a contemporary high tech organization can be stated reasonably comprehensively as follows:

Develop a holistic business management model which ensures

- the transformation of
- high tech engineering companies for
- sustained value creation and
- global competitiveness.

This process has to be implemented,

- in a consistent, discontinuous yet repeatable manner
- by means of periodic reflection, bold innovation, judicious risk-taking and rapid execution.

This explains the relatively long title of this thesis.

1.4 RESEARCH OBJECTIVES

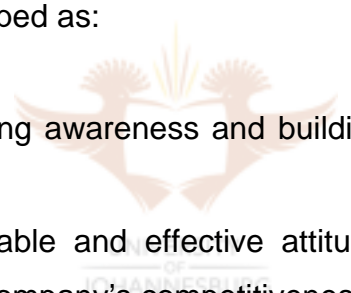
In general terms the objective of this thesis is

- to create a business leadership and management model that can pull the diverse aspects of the stated research problem together in a meaningful, rational and academically rigorous way so that the aspects of the bullet points in the above paragraph are satisfied.
- to provide a useful guideline to achieve the outcome alluded to in the thesis title, in the metaphorical sense of *“providing the best shaped surfboard for the most competitive ride on the unpredictable waves of the ocean of business opportunities”*.

The different aspects to be covered in this thesis are of such wide scope, the dynamics relatively case-dependent and the real situation so multi-disciplinary in nature, that the subject matter has to be broken up into components for articulation and understanding. There is a limit as to how much can be put on paper to advance the mind-set behind the management model.

The big danger is that with a *bricolage* of topics the insensitive reader can lose the bigger picture and the dynamics behind it. That is a danger that is fully recognized and a reason for the relatively long introductory Chapter 1 and 2. These two chapters attempt to provide a thinking frame of reference into which the management model must be rooted to be understood, articulated and finally practiced.

This thesis will cause many questions with regard to instruments, methodologies, processes, systems and personal competencies required to transform high tech companies which can be grouped as:

- 
- Instruments for achieving awareness and building perspectives conducive to a chaotic environment
 - Instruments for favourable and effective attitude and behaviour modifiers to achieve the high tech company's competitiveness at a sustainable level
 - Instruments for the implementation of specific techniques in an unstable, high risk, paradox environment

The first two points are a pre-requisite for the last point and are very soft-factor based. It could be said that chaos management, which is very much anathema in a high tech company, will have to focus much more on soft factors than on the implementation of the specific techniques.

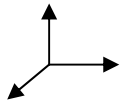
Is it possible to get some structure into a flowing, evolving environment? Is such an elusive structure really necessary, desirable or beneficial? The suggested means might be through the definition of some fixed grid points or anchors whereby some more pertinent aspects can be handled one at a time and re-integrated at some later stage. This is attempted with this management model.

The basic methodology of the management model of this thesis orientates itself on the following **anchors**: Time and space, a system framework, a process and an integrator. The expression anchor is used because some form of reference which provides a degree of stability in the midst of the storm of the daily operations of any business has to be found and articulated.

These chaos anchors –the eye of the storm, as it were- are briefly described as:



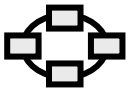
Time → The moment of time and its contemporariness, *Zeitgeist*², dynamics, kinematics, evolution, discontinuous business cycles, mind-sets, perspectives and values



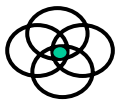
Business Space → a three-dimensional space in which the three spatial axes define the business environment in its entirety



A System Framework → the broad challenges which every business has to address; three of which are strategic, three are operational in nature and one is spanning everything the organisation does



A Process → the four-step process **Imagine-Shape-Deliver-Support** is based on the learning cycle and leans on very practical considerations



An Integrator → Integrating all concepts and sub-models on a continuous basis in a framework of effectiveness and sustainability is the essential heart and capstone of the management model. Because of its all-inclusive integrative nature in a completely non-restrictive open system context it represents an extremely powerful methodology which is particularly valid for the fast-paced, turbulent digital age of unpredictability.

To elucidate these anchors a bit further it is important to recognise the contemporary *Zeitgeist*. Many a good reference work on management practices of the previous two decades and older is made obsolete just because the thinking framework, or *Zeitgeist* of the period when these methodologies were proposed, is no longer valid.

Equally significant is the recognition and awareness of the ever changing business space within which the organisation is operating. This business space is subject to

² *Zeitgeist* – n. Spirit of the times, drift of thought and feeling in a period (Oxford Dictionary)

changes in technology, changes of a sociological nature in society, and due to the networking / communications that takes place globally to mention just a few. [178] Unless there exists a high degree of awareness of the changes taking place on a large number of levels in different areas of human endeavour and how to effectively handle the resulting conditions, there arises a tendency to operate in a ever deepening cul-de-sac.

System thinking and the art of seeing the whole when making decisions nevertheless based on specific detail is essential in a world characterised by complexity, interconnected-ness and speed. Unless a holistic scope is considered as part of the contemporary management model, nothing substantial will be achieved.

As rigid recipes cannot cater for all eventualities in a complex and turbulent world, there has to be a process in place that is sufficiently structured to handle just about any eventuality, but loose enough to cope with complete uncertainty and as-yet-unknown surprises too.

Finally, because of the great number of disciplines and factors involved, a management model is required that can effectively integrate the diversity and the conflicting requirements. This kind of integration is mainly to be found in human capacity building and ongoing personal development.

All the above will have to be considered within a super-framework of value-added management principles where the essence of the expression value-added reaches all stakeholders in a company. After all, the enterprise has to be profitable, increasingly responsible in its actions and indeed accountable to its diverse stakeholders such as employees, customers, shareholders, banks, unions, suppliers, environmental groups, the government, the local community, the media and a few others.

In the thesis title it is important to note why certain words were chosen and what they mean to the author. The eighteenth-century French philosopher Francois-Marie Arouet, who was better known under the pen-name of Voltaire, is quoted as saying: *"If any man will reason with me, let us first define our term."* [<http://www.voltaire.ox.ac.uk>]

- The management model must be **holistic** or wide-ranging, wide-scoping across disciplines; it must address as many issues as possible that have a causal relationship to managing a contemporary high tech company even though these may be in other disciplines or may not be readily evident. System thinking must be applied in the development of the model and be applicable when executing the model. Only a concurrent and holistic approach can ensure whole-sight and in-sight and produce visionary fore-sight.
- The suggested approach is **a model**, after all. A model attempts to simulate the real world and will provide relevant answers when given the same initial circumstances and boundary conditions. The word 'model' can be accepted here in that, although not every single situation can ever be anticipated and catered for, the model is sufficiently detailed to obtain predictable outcomes, at least when looked at from a high enough level. It must also be clear that in a high tech environment the word model implies accurate predictability. The characteristic of the model considered here is not so much precision and predictability but rather an 'opportunity approach plan' that lowers the risk and promises a better than even chance for sustained competitiveness for a high tech company undergoing transformation.
- **Transformation** refers to the complete change of company culture (ie values), attitudes, behaviour, handling and utilising of the knowledge base, developing and executing strategic intent, communication and generally the way things are done operationally in that organisation through the interventions of its collective leadership. Transformation implies completely re-thinking, re-structuring and innovatively implementing change. It is usually radical in the sense of a complete paradigm change.
- **High tech engineering** companies are the subject matter to which the model is applied because these are generally more prone to disregard some of the identified factors that are considered critical in a transformation process and as organizations are deemed to be better understood due to the experience and background of the author.
- **Sustained value creation** refers to the long-term goal and stands as a contrast to quick fixes and chasing after management fads. The model must be of sufficient depth and scope to ensure longer-term economic sustainability. It

includes the important concept of added-value in terms of anything and everything the organisation and its individuals are engaged in.

- **Global Competitiveness** refers to the fact that high tech companies have to satisfy/anticipate the client's needs in a global context, at an acceptable price, speed and quality whilst still conforming to economic realities and satisfying all sorts of stakeholders within a non-steady, often unpredictable, environment.

The objective with such a management and leadership model is to create a transformation business leadership and management model for the increasingly digitised, interdependent and highly connected post millennium era that can pull the diverse aspects of hard ratio-think and soft intuitive-think together in a meaningful and academically rigorous way and one that can be implemented practically and effectively.

The implementation of the management and leadership model itself cannot be part of this study, but examples will be given where these approaches have been implemented, at least partially, in some companies locally and internationally. Such examples are given in the main text of the thesis. Some answers in support of the main tenets of the thesis can be gleaned from the responses to a questionnaire which was sent to 563 managers and business leaders as well as seminar and workshop participants of the author. Appendices A and B show the questionnaire and the responses. The questionnaire was developed along the guidelines provided by the Cape Town based *Institute of System Health* of which the author is a director and in part by Cooper and Evory [313]

The author of this thesis has over the past 25 years applied the model's principles with varying, but improving degrees of success as time and learning progressed, both in his own management experience in a number of high tech companies and as an internationally active business consultant for the past 14 years. [<http://www.winzker.com>]

By the very nature of the topic, within the framework of the contemporary digitised, highly mobile and turbulent business environment, the author found that in successful business organisations *effectiveness* has a higher priority initially than *efficiency*. This may be somewhat of a surprise but was found to be an important, indeed critical,

characteristic of successful business life internationally. In other words, doing the right things must precede doing things right. Obvious as such a statement may appear, our engineering-trained preoccupation with impeccable precision is often carried out at the expense of accuracy, i.e. hitting the wrong target *precisely*.

It is encouraging that some progressive high tech companies have already learned and applied the softer approach to be very successful in a holistic sense, although they may not always have a formal model to go with it. Much of the success or non-success is related to the ability of the organization to integrate as much of the extreme diversity and scope of different business parameters in a dignified (people orientated), profitable (satisfying different stakeholders), sustainable (over a long period) manner.

Please note that for this study the traditional and rational line-function components of a typical high-tech business and its workings have been taken for granted and will not be specifically discussed; i.e. the need for proper project management, the need for qualitative analysis of the scientific disciplines, the need for budgets, manufacturing processes, procurement documentation, quality, safety and environmental issues etc. Not even staff functions such as human resources, finances and marketing have been specifically considered although these aspects are mentioned in some contexts from time to time. In the context of this thesis effectively and efficiently running line- and staff-functions are taken as given and assumed to be in place in a well-functioning high tech organization.

The thesis concentrates on some of the more softer factors but by no means does it advocate the rescinding or depreciating of analytical functions that will form the basis of good business. Those fundamentals will always represent the backbone of any business, but the critical importance is the way in which those fundamentals are embedded in soft factors such as leadership, culture, trust, enablement, innovation and a host of others.

Business only achieves its usefulness when the fundamental essentials are utilised in a harmonious dynamic manner responsive to the ever changing business environment. Analogous perhaps to proteins, enzymes and DNA, which are a necessary backbone in living organisms, it is their proper specialization, integration and collaborative

functioning in a human body that makes the body come alive, productive and enabling it to survive in its environment. [314]

The thesis takes its lead from the *Leitmotiv*³ of the Swiss-based Huenigen Forum Foundation's guiding principle⁴,

***“Today’s business world, like life,
- is not about rules and structures.***

It is about learning and exploring.

It is about sharing and networking.

It is about finding out

What Works.”

1.5 BENEFITS OF THE RESEARCH

The benefits of this research is covered by a number of points:

- The comprehensiveness of the approach
- The pertinent relevance for high tech organisations
- The multi-disciplinary nature of the approach and hence the effective integration of diverse aspects, soft and hard
- The underlying system-thinking approach

The thesis is sufficiently broad and attempts to incorporate a multiple of issues in a time- and circumstances-independent manner. Such a consideration however, qualifies it for application in a wide range of organisations other than high tech, at least such as those the author has been exposed to internationally over the last 14 years.

More specifically the research provides a guideline to a most fundamental aspect of high tech companies:

³ Leitmotiv – German, n. Theme associated throughout piece with some person, situation or sentiment. Oxfors Dictionary

⁴ The author is co-founder and Program Director of the Swiss Huenigen Forum Foundation, Schloss Hueningen, Konolfingen i.E

- How can technically trained managers and leaders effectively build the bridge between rational, analytical and analogue, intuitive issues to enhance the value-generating, globally competitive, human dignity-endorsing aspects of high tech organisations in a consistent and sustainable manner? In other words, how to achieve effective and repeated transformation considering hard and soft issues equivalently.

1.6 RESEARCH PROCESS

Being limited to a sequential presentation of the research material the research process in this thesis attempts to elucidate what is essentially an unstructured parallel process of loosely connected separate issues and to let the multi-dimensional nature of the model develop in the readers head.

- To attempt to develop such a wide-ranging model is a risky undertaking in terms of an academic research process but constitutes the risk that the author is willing to take. Taking this risk must not be construed as being overly arcane or purposefully ambiguous but the very essence of the proposed management and leadership model lies in the mental awareness and juggling of a large number of factors simultaneously and the ability of the reader to make sense of as many causal and a-causal factors as possible. Often these involve paradoxes which seem to have strong validity on both sides of the divide. Although descriptive in parts, the thesis is never the less more objective than subjective.

It has been the experience of the author when teaching this model to post-graduate engineering students or conducting company-in-house workshops in business transformation that

- the apparent lack of direction or focus (sometimes perceived and suffered by the participants to the point of dissent) during the first part of the workshop,
- the multiplicity of seemingly unrelated topics of the contemporary business environment and
- the mixture of hard and soft issues – i.e. hard engineering and softer people issues

finally crystallises in a significant learning-moment during the last 10% of the sessions (with regard to the time aspect) with the management model framework now firmly understood, even if not yet implemented. This can also be seen in the results of the questionnaire returned from students and in-house company attendees shown in chapter 5.

Based on that classroom, workshop and consulting experience in an international industry context, the written thesis will now attempt to document or formalise the multi-dimensional multi-disciplinary nature in a research process that hopefully also achieves the significant learning-moment in the reader.

Basically the research process is a mixture of drawing out of experience, expertise, discussions with many business leaders in many countries and the study of a considerable volume of literature. Everything so included would constitute the real-life research process which encapsulates the wisdom found in the bibliography, many researching dead-ends and back-trackings from conceived ideas and the feed-back and interaction of literally hundreds of individuals that provided the insight and learning progress in the author.

If an apparent overlap of research problem and research objective, or outcome, with the research process is noted, it is indicative of the process being part of the problem as well as the outcome and vice versa.

There exists an interdependence in that the research problem definition is very much influenced by the experience and background of the author and that a different person could perceive the research problem statement in a different light.

The outcome is similarly influenced by the research process depending on the choice of emphasis on financial results, human factors or circumstantial conditions or what constitutes the appropriate balance between the diverse factors.

1.7 NATURE AND STRUCTURE OF THE THESIS

However, so as to be practical and to stick to some recognisable convention the thesis

- **is structured** in what is considered to be a logical way to ensure the natural flow of the material (even if sequential) to facilitate understanding and insight
- **is presented** in such a manner that the author's articulation of concepts can be easily followed and interpreted unambiguously.
- **contributes** to the art of managing and leading high tech companies in a real, effective and practical manner

This thesis does not specifically solicit the findings, experiences and opinions of business leaders or academics in comprehensive statistical surveys but includes the response of some such leaders to the questionnaire given in Appendix A and B as a limited research survey.

Of course, in the final analysis the research has to be

- relevant
- valid
- practical
- applicable



Furthermore the approach is the application of system thinking to a non-technical domain (management) which is similar but goes further than Blanchard's System Engineering definition of *"the effective application of scientific and engineering efforts to transform an operational need"*. [315]

Here Checkland's approach to a problem solving situation is closer to the truth: *"a problem relating to real-world manifestations of human activity systems is a condition characterised by a sense of mismatch, which eludes precise definition, between what is perceived to be actuality and what is perceived might become actuality"*. [200]

Getting to grips with qualitative aspects in a realm of quantitative thinking has been the subject of many authors and academics as will be shown in Chapter 3, but each one perceives the situation from their own professional and academic discipline. [300] [303] [307]

Valid as it may be in every instance, it still does not effectively build bridges between management and leadership on the one-side and innovative value based engineering on the other.

The research in this thesis is presented in six chapters and an introductory synopsis:

- The synopsis provides a high level overview of the thesis, the research conducted and the research results.
- Chapter 1 provides the introduction and general background to the thesis theme, the research objectives and the research process.
- Chapter 2 elucidates the required wide-open perspective from a number of angles and focuses divergently on utilising the past, present and the future; it investigates the business environment in a multi-disciplinary manner as well as considers intuitive and rational factors. The first and second chapters attempt to recognise, or make sense of myriad of factors that interact with the high tech organisation and influence the future so that today's action can be relevant to that future.
- Chapter 3 consists mainly of literature reviews and some analysis of past and current approaches to describe a holistic management model.
- Chapter 4 synthesises the proposed management model and elucidates the proposed model for transforming high tech companies for sustainable value creation.
- Chapter 5 presents the results of a survey conducted by means of a questionnaire sent to management personnel in international companies.
- In Chapter 6 the conclusion of the research is elucidated and recommendations as to future work on the proposed management model is given
- This is followed by appendices pertaining to the thesis.

1.8 CONCLUSION

The objective of this thesis is to provide a new integrated model to transform high tech companies for sustained value creation in the context of the post-modern very globalised and highly competitive business environment. A new paradigm set in a holistic and system thinking framework has to be found to articulate a new management model.

In particular,

- The results of the research should make a significant contribution to the existing body of knowledge in this field
- The proposed model resulting from this research should be applicable in practice

The unsteady business environment such as encountered by most high tech companies must be approached in a new innovative manner where so-called soft issues and hard analytical issues are leveraged collaboratively for maximum flexibility, adaptability and value creation in a sustainable manner.

While the author of this thesis has already implemented the management model that is the subject of this thesis, it is difficult to convey the characteristics of multi-focus vision, the new dynamics and interdependencies of many factors in the post-millennium business world in an academic sense. This and the following chapter attempt to describe the background and to set the scene for the management model described in more detail in Chapter 4.

CHAPTER 2 - GETTING PERSPECTIVE ON CONTEMPORARY BUSINESS REALITY

2. GETTING PERSPECTIVE ON CONTEMPORARY BUSINESS REALITY

“The best way to make your dreams come true is to wake up” – French Poet/critic
Paul Valery

2.1 INTRODUCTION : A DIGITAL FAST- MOVING, TURBULENT WORLD

Today’s business world represents a new digital world. Everything seems to be projectable unto a screen and is portable. All sorts of information, wanted and unwanted, comes at decision makers from all corners of the globe and can reach them in real time everywhere. The data and information flood appears insatiable both on paper and in digitised form. What is real? What is virtual? What matters and what is irrelevant? Randall P White expresses it as follows in his book *“The Future of Leadership”* [21]: *“Executives find themselves in a wind tunnel with sheaves of paper being propelled towards them. They catch one and rush around proclaiming they know the answer. All they have found is part of the jigsaw.”*

Today’s business world also represents a highly-connected world where each individual, group, business and even nations visit multiple synapses of a multi-layered gigantic network. Leadbeater [232] in *Living on Thin Air* has the following comment: *“In the knowledge economy, companies will need to become more like networks of intelligence. Instead of being modelled on machines, companies should be modelled on networks of intelligence, like the human brain”.*

The contemporary world is a fast-moving world where boundary conditions change daily, hourly or worse and where decades of tradition are thrown out at a moments notice if it does not appear to fit into the new economy. *“Where the human brain meets data processing, there are just two important devices: the brain and the wrist-watch”* as expressed by James Gleick [238]

The world experiences incredible fluctuation and unpredictability which affects everybody's environment in a multitude of ways. One is simultaneously subject to and creators of a flow and evolutionary process which in its detail is completely unpredictable. This increases risk and the potential for failure; it also creates unprecedented opportunities and potential for wealth creation. A pertinent comment by the German Futurist author Gerd Gerken makes the following observation, *"Most managers and business leaders have not yet grasped that they manage evolution and not people and systems."* [72]

The business environment also represents a world of simultaneous less-and-more sense and meaning; a paradox that shakes the basics of the human soul. The mechanistic world view of business and where the individual fits into this machine process is increasingly seen to be erroneous. The analogy of business processes to the business of life which is messy, yet meaningful, are reflected in the way spirituality and esoteric considerations have become a factor a greater impact and importance in the work place.

An example of typical newspaper and popular magazine articles considering this phenomenon [320], is given below: *"In times of the disintegration of traditional values, in times of increased stress and inner restlessness more and more managers are asking for the sense and meaning of their daily activities. An outcome of this is an increase in well attended courses and seminars with spiritual, ethical and mystical topics even by highly regarded academic institutions."*

Today's world allows an individual to achieve the exponential power of ONE. By means of the internet alone any individual can potentially multiply her input and output power by a factor of millions. This is a relatively new capability and has a direct bearing on business today, in that the influence and direction a company will set for itself can come from the bedroom of a 16 year old connected to the internet somewhere on the other side of the world.

Observe what the youngster Shawn Fanning did to the music world when he wrote a simple computer program providing "any song, anytime, for free" through the website

Napster, attracting 38 million users, according to Time Magazine of December 18th , 2000. As Time put it in its article *“even a legion of lawyers will not get the genie back into its bottle”*. As indeed, giant entertainment groups like Sony and Bertelsmann have found out. Leonard Sweet in his book *Soul Tsunami* makes this comment: *“The brand of Michael Jordan of US basket ball fame has a 10 billion Dollar impact on the US economy. What individuals like Bill Gates and Oprah Winfrey are doing is more important and has a greater impact globally than what most corporations do.”* [246]

In the West, or at least in most industrialised countries of the world, there exists an individual-culture in contrast to a group-culture [194] [195] [196]. Combined with many other factors, which will still be discussed in this chapter as well as Chapter 3, the individual is planning his or her life in terms of meaning and self-actualisation or as Gerken puts it *“individual employees are looking for authentication”*. [72] This is in direct contrast to most organisations still being rigidly hierarchical and where the employee is still seen as an owned asset that has to submit to the superior insight of senior management.

The few descriptors above are by no means comprehensive but will provide the backdrop in which a holistic management model for sound high-tech companies will have to be developed. All these issues, and many more, pervade the business environment in these most interesting days but are seldom acknowledged in contemporary management models, generally less so in the more technical environments.

The incorporation of such aspects in this thesis is deemed essential if a sound and effective management model for this decade is to be realised. Yet, *“Unpredictability does not imply un-directability”*

2.2 BROAD TRENDS

2.2.1 Past-Forward: Historical Trends to the Future

By very broadly surveying the past couple of decades the management imperative for each decade up to the nineties can be characterised as follows:

1940s – After the decade of the Great Depression, the West entered the age of opportunism; Production is based on cost during and after the war effort; the Black Market thrives; massive government intervention takes place in western democracies in business by instituting new laws and regulations.

1950s – This decade is fuelled by government aid in the USA and the Marshall Plan in Germany, as well as the reconstruction of a destroyed Europe. The Fifties could be called the decade of production and producers; introduction of time studies and the shortening of processes; encouragement of entrepreneurship and focus on manufacturing; employers seek hands, not heads; cost of labour increases and labour becomes organised.

1960s – Technology proliferates and technocrats gain influence through Space Race (Mercury to Apollo Programs) and Cold War; the 60s are the age of competition; the consumer increasingly challenges the producer for quality and cost-benefit improvements.

1970s - The age of economy of scale and increasing demand; the age of structured marketing and manipulative selling; there is a significant increase in the globality of markets; commencement of the age of the PC and global mobility of the individual; the American moon landings showed that the combination of vision, technology and political will can achieve virtually anything.

1980s – The decade of Bankers and financial institutions; increasing fluctuations of financial and economic factors; the decade of mergers and acquisitions; a decade of enormous government and individual debt servicing creates many a business crisis by eroding the capital base of many businesses large and small. Re-Engineering in

many forms is the methodology used to grapple with the demands of a turbulent environment, often resulting in repeated re-engineering efforts in the same company according to Re-engineering Guru Michael Hammer. [11] [12]

1990s – Optimisation of human capital and human capacity building in organisations; the age of humanised leadership in business; also the era of mass lay-offs and ruthless down-sizing; dawn of the digital revolution and age of information technology; age of instant dotcom millionaires; era of destruction of wealth through NASDAC tailspins; easy access to stock-trading for everyone; increasing stock market instabilities; mega-mergers and unbundling, committing auditing fraud on an unprecedented scale with subsequent collapse e.g. Enron and Globecom in the USA.

2000s – Internationally diverse production and management; the death of distance and borders; the age of e-commerce and accessibility; 'content' is the currency of the future; increase in kinetics and the acceleration of just about everything; digital globalisation; computer technology and people compete and join forces, paradox and ambiguity becomes prevalent; the power of ONE via the internet; complexity and global interdependencies on the rise. Progressive conflicts of civilisations over resources and ideology are the order of the day [278].

2020s ? – Attempting to look back onto the present day from a 2020 vantage point it can be surmised that the actual revolution started in the 1970s, grew to infancy by about the year 2000 and matured by 2020 into a *"nano-technology bio-economy where information is shared via a global digital skin"* according to an expression used by Grulke [265]. What's more, in the world of the new economy this information is *"instantaneously available, perfect and for free"* according to Rodin [267] or again in Grulke's words *"the reality is that information has no value, unless it is available immediately or accessible before you need it!"* [265].

Under such circumstances, leadership, vision and flexibility embedded in a culture of trust and open communication geared to fast response and change of direction if necessary, are essential characteristics that will let organisations survive and thrive over the long term. The perceived success in leadership of the Major of New York in the aftermath of September 11th was succinctly summarised by TIME Magazine [321]

and is equally applicable to leadership in any high tech organisation, *“When a leader communicates, he (or she) does not provide information, but inspiration”*.

By noting the business emphasis of each decade, although superficial and arbitrary in its selection of major impact points, it can be seen that the business environment has increasingly turned away from structure and predictability and has evolved more and more toward an increasing blend of hard and soft factors, toward unpredictability, turbulence, paradox and the environment is continuously flowing and changing. The prevalent management style has changed with those changes in environmental conditions. The management task of industrial and high tech companies is even more at risk now due to the high capital investment and a tendency to analyse only rational factors whilst some of the greatest impact comes from other even more intangible aspects such as image, emotion, intuition and experimentation.

2.2.2 Competitiveness trends

Whilst competitiveness is still one of the major criteria by which an organisation's health can be measured, the conditions controlling competitiveness have dramatically changed.



MARKETING -

- Today there is a move away from linear competition. Where marketing has traditionally been seen as a military battle by Ries, [78], Duro, [76] and others, marketing is increasingly seen as a relationship-building exercise which requires impressive interpersonal skills, specific talent in identifying the core solution to the client's problem, as well as persistence, courage and innovation. A gradual move to new approaches which includes co-operation and collaboration even between fierce competitors, the internet and e-commerce as well as a host of networked interactions was already indicated by Gerken [63] in 1990.

In the post-millennium era it is more of a contest in innovation and finding new approaches to satisfying the customer's requirements and solving their problems. But it goes further than the customer, the employees and the shareholders/owners. The last mentioned are but three of a host of stakeholders

whose needs and problems have to be addressed concurrently: suppliers, banks, the media, unions, the community, government regulatory bodies, pressure groups such as environmentalists and other activists, pacifists and any number of special interest groups.

To accommodate all those interest groups demands a concurrent approach fraught with conflicts of interest and compromise which will not yield to a serial, step-by-step linear approach. Hence, what is required practically consists of a highly interdependent and messy process which in the conceptual sense is mostly non-linear and often refuses to be packaged into a workable structure. In such an environment an organisation must apply other methods and an openness to opportunities and threats which would call for situational competitiveness, or JIC – Just in Case Competitiveness. JIC thus contains elements of opportunism and agility, flexibility, innovation, high risk and instability and the inherent requirement for the individual to thrive in uncertainty.

- As a result of effective digital communication, ease of travel, globalisation and deregulation as well as accessibility by just about everybody to everybody via the internet, markets are quite transparent and yet have become relatively complex. Due to this complexity of the globally networked and interdependent markets, the fight for market-share is replaced by a better understanding of the continually changing dynamics. An organisation has to understand the change from the previous marketing-pattern of a few strong competitors in the past, to the pattern of multiple-surprises. [302]

The greatest challenge here is increasing awareness of what is going on in the market – but on a much wider front than the specific market sector alone. This awareness has to encompass a multi-disciplinary range of aspects in which the business leader has to actively participate in the formation of the boundary conditions that created the market-pattern in the first place. Traditional market research will not suffice under such circumstances. Indeed, in most cases traditional market research will produce expensive and irrelevant historic information which no one will read, much less utilise productively.

GLOBALISATION -

- Globalisation is by no means a new phenomenon, but the world is much more conscious of the global interconnectedness of business, money markets, commerce and communications. Since the beginnings of exploration and trade, e.g. during the Austronesian expansion of 6000 years ago, Polynesians covered the whole Pacific from Taiwan, Indonesia and the Philippines to Africa's West Coast, Madagascar, Hawaii and New Zealand [244] From the Chinese, the Egyptians, the Greeks, the Romans and in more recent history the Venetians, the Dutch and the British, there has been international trade in an ever increasing volume.

Today however, this commerce and trade takes place on an unprecedented scale across the boundaries of all countries. It is happening at a fast pace, at high volume, across technologies, languages, cultures and civilisations. This global exchange of products services and finances takes place despite and in spite of political agendas and even during serious clashes of ethnic groups (Yugoslavia, Sri Lanka), countries (Greece and Turkey over Cyprus; India and Pakistan over Kashmir), internal religious conflicts (Ireland, Israel, Palestine), international terrorism (USA and Afghanistan) and now even threatens to escalate across civilisations (The West against Moslem countries, the West against China) [278]

In more recent times the anti-global fears of demonstrators in Davos, Seattle and Genoa at the Economic Summits of the G8 nations seem to echo the sentiments of Karl Marx and Friedrich Engels expressed in their Communist Manifesto of 1848: *"Modern industry has established the world market. All old-established national industries have been destroyed. They are dislodged by new industries whose products are consumed in every corner of the globe. In place of the old wants, we find new wants, requiring for their satisfaction the products of distant lands and climes....All fixed, fast-frozen relations are swept away; all new-formed ones become antiquated before they can ossify. All that is solid, melts into air."* [<http://www.anu.edu.au/polsci/marx/classics/manifesto.html>]

The pertinence of the above two paragraphs to this thesis is this: In current and future times the globalisation process will proceed at an ever faster rate than before, will be more convoluted and confusing and will change the world of global

commerce profoundly. The individual manager of a high tech company may not agree or even like the implications nor like the fall-out and daily disruptions of globalisation. He or she will however have to handle the often emotionally charged, often highly irrational aspects, sometimes politically expedient manipulations impinging on the high tech organisation.

A very critical component will be the cultural empathy of the manager dealing with foreign cultures, languages, religious convictions and even different civilisations. The multi-perspective, multi-point of view ability of the modern business leader, the communication skills across language and idiom, body language and cultural taboos as well as the mental separation of bias and personal values and a host of other personal aspects when dealing in the international arena, will become a most pertinent measure for the organisations success of sustainable global competitiveness. [307] [308] [309]

BUSINESS STRATEGY –

- Strategic thinking used to be dominated by a linear input-output culture that handled perturbations in the framework of that organisations own planning-rationality. It is evident that although an appropriate business strategy is still very important, such a strategy is now characterised by a loosely stratified, non-rational, or at least non-related group of dynamics which originates external to the company across different disciplines.

Furthermore, it involves all the diverse stakeholders that a typical organisation has to cope with in today's environment. This poses a new paradigm for handling and formulating strategy in any organisation. Ansoff, Declerk and Hayes [289] provided the initial new thinking about strategy in 1976 when they elucidated the progress from purely financial planning of the 1950's (which could be described as extended budgeting) to the attempt to match the company's strategies to the perversities of the real world during the Sixties. Gluck, Kaufman and Walleck [290] published a study of developments of strategic thinking in the Harvard Business Review which showed that the 1970's for the first time introduced external factors in their consideration of strategy. Only during the Eighties and Nineties did the strategic approach include the possibility of creating

the future for the specific organisations made famous through Scenario Planning as a useful tool under De Geus at Shell [16].

Hussey's work of International Review of Strategic Management [99] in its various volumes provides an excellent review of the development of strategic management over the last four decades prior to 1990. The last decade spanning the century transition has brought many new concepts and approaches to strategy which are as intangible and "momentary" as anything of this age. The expression Strategic Intent was coined by Hamel [22] and the two words express some of the transitional nature of strategy. The expression Strategic Intent also inclines more towards the vision aspect and a lesser emphasis on detail planning. One can reasonably agree with Grulke's statement "*Today businesses are defined more by their relationships than by their products*" [265]

BUSINESS CYCLES –

- The pressure on shortening design-, development-, manufacturing- and distribution-cycles has increased steadily over the last 20 years. [20] [67] [68] The Just-in-Time concepts of the 1980s now have to cater not only to time *per se* but must also relate to the different characteristic time dynamics of a host of external factors. For an organisation this implies that it will now have to relate its own various cycles to the real time dynamics of external factors. No matter how divergent these may be. Future competitiveness standards can now become the competitiveness of anticipation and being in-step with a multiplicity of different dynamics.

EFFECTIVENESS –

- One other important observation is that successful companies move away from the concept of management by objectives which was so popular in the 1970s. The reason for the turning away from the objectives emphasis is quite logical: The gradual shift of the global markets in terms of complexity, clarity, globality, dynamics and compression of cycle- and communication-time determine that specific goals are no longer valid as specific destinations. The rational causality link is mostly broken long before the goal can be reached and reaching

a specific goal is replaced by recognising and achieving appropriate processes, such as shifts, drifts and trends.

Optimising business performance thus primarily depends on recognising perturbations timeously and optimising processes fast and in line with the perturbations, rather than reaching a particular target or goal. This is analogous to surfing in the ocean when the target direction is the beach but the details of the actual ride are assessed and implemented from moment to moment in line with the behaviour of the wave. In this connection, effectiveness has a higher priority value in the contemporary business than efficiency. This represents a significant, if not revolutionary, shift in focus. It also implies having peripheral vision and acting on it, which acts as an early warning radar for probable changes in the larger global environment, the countries concerned, the specific industry sectors and competitors behaviour as well as the shifts in technology.

2.2.3 The democratisation process

Up to the fall of the Berlin Wall and the demise of the Soviet Union in the late eighties and early nineties, the world by and large, was carved up, walled in and neatly categorised in political boxes of interest or influence. [<http://www.cia.gov/csi/books>] The walls were barriers between nations and between people, between producers and consumers, between politicians and ordinary citizens. The barriers prevented communication, understanding and collaboration. The beginning of the Nineties changed all that and with it came the sweeping changes, that have to be somehow incorporated in any management model that attempts to describe the transition of a high-tech company into a sustainable global competitiveness scenario.

According to Friedman [237], the democratisation process that started with the fall of the Berlin Wall in 1989 blew away all previous assumptions of how people communicate, how people invest and how people learn. The democratisation on an almost global scale, of information, the technology, of financial processes and that of the professional knowledge worker amongst others, created totally new dynamics of how nations, organisations and individuals interacted with each other.

- *The democratisation of Information:* The satellite dish, the internet and television have enabled people to see through, hear through and look over every conceivable wall. Although still in its infancy the ongoing process of marrying of those technologies is already significantly changing the way people interact with each other and are learning from each other. Never before in history have so many people been able to exchange information and ideas on each others products, services, thoughts, aspirations and learn about each other; across-country borders and more significantly also across-cultures. [232] [264]
- *The democratisation of Technology.* With more and more home computers, notebooks, cellular phones, modems, optic cables and internet connectivity people have been enabled to reach further, into more and more countries, faster, deeper and cheaper than at any time in history. The process of digitisation has had such a fundamental impact on the larger global community already that it has brought hundreds of millions of people together and has given each one of them a voice that can be heard. [237]

The implications are stupendous: The potential for wealth creation becomes geographically dispersed and creates more competition, more collaboration opportunities, more interactiveness, more exchange of ideas and more potential innovation. Already the world of knowledge, information, labour, finance, news, rumours, trading, letter writing, music and video and a multitude of other factors have changed irreversibly and will continue to change. This will certainly affect every single business, impacting some more critically than others. Business leaders and managers of high tech companies will have to cope with issues for which they are largely untrained and often hold disdainful attitudes.

The dynamics will be almost unpredictable so that only the alert and the fittest in business will survive. A report in the September 18th, 1999 issue of The Economist states that phone operators work out of India for a call centre for GE Capital. In the late Nineties, Swissair moved its entire accounting division to India to take advantage of the cheaper labour for programmers,

accountants and secretaries. The Far Eastern Economic Review of Sept 2nd, 1999 [319] reported that “*America On Line has 600 Filipino customer-service reps in Manila who answer 10,000 to 12,000 technical and billing enquiries a day, mostly from the USA, which amount to 80% of AOL’s customer e-mail.*”

Depending on where bulk postage rates are more economic in a particular month, a German bank has their client’s monthly bank statements electronically transmitted to and printed out in either Istanbul, Madrid or Copenhagen and mailed from there to households in Germany, and realising substantial savings in the process. This was experienced first hand by the author while living in Germany during 1990 to 1992.

The process of democratisation of technology is by no means over; it is continuing at a tremendous pace: cell phone technology and so-called 6th wave persuasive technology are just two on the near horizon to become mature technologies making potential interaction and the resulting dynamics even more complex.

The introduction of genetic engineering and the combination of biological substances with the fast computing power of the silicon chip will create conditions for which we have no vocabulary as yet, much less proper understanding.[<http://www.geneng.com>]

[<http://www.springeronline.com/sgw/cda/frontpage/0,11855,4-10100-72-33523872-0,00.html>]

- *The democratisation of Finance:* This is another critical factor that made globalisation possible and hence changed the way people look at the world. From junk bonds, day-trading, foreign investments, government bonds to internet banking, finance is now no longer the reserve of a mighty few, be they brokers or mighty banks. Even the debt of countries such as Mexico is borne not by a few major banks, but such foreign government bonds are now widely dispersed to individuals, pension funds and mutual funds. [228] The same holds for shares in Nokia, Daimler Chrysler, Anglo American, SAB, Microsoft or Benetton. A result: predictability is virtually non-existent.

These processes put managers and their companies under greater scrutiny, particularly if they under-perform. Even the smallest shareholder can become a major stakeholder in a listed company if the shareholder mobilises like-minded fellows via the internet. Democratisation has its perils for the inattentive, or worse, arrogant manager / organisation. This represents a major change to the previous half-century.

- *The democratisation of contemporary banking* With the advance of the digital cell phone functioning as a safe personalised credit card, money transactions will shift irrecoverably away from banks and other financial institutions. Cell phone Service Providers could make the use of VISA and Master Cards obsolete. “Banks will be the last to know” [201] because they -the company- have largely ignored / not recognised that what they have to own as a business is not the product but the customer relationship.

Today, financial services companies apparently process less than 30% of all credit card transactions and banks only handle about 12% of personal savings as overheard during a radio talk recently. Within five years the traditional concept of a bank, an insurer and a broker will have all but disappeared. [237] The real winners will be the new flexible, nimble financial players knowing how to behave toward the Smart Consumer in an open deregulated market, armed with great ideas and with no historical baggage [265].

- *The democratisation of the professional knowledge worker in a know-how company:* This may indeed be the most important but also the least tangible of the observed changes as comparatively few companies show in their actions that they have truly understood the implications. For the question arises who ‘owns’ the knowledge tacitly resident in the organisation’s personnel?

Ownership confers the right to possess, use and manage an asset, to earn income from it and to claim an increase in its capital value. Ownership also confers responsibilities on the owners to refrain from harmful use. Yet it is far from clear that shareholders *own* an organisation in a sense of *possessing* it.

A know-how company is created when people pool their intangible assets, including their knowledge, expertise and customer relationships. For a high-tech organisation, the core of a knowledge-based company is the expertise of the people who work there, not so much its systems or even its processes, important as that may be. From a management point of view, the managers have to earn respect and authority on their ability to promote co-operation and collaboration among the providers of know-how. This requires very specific personal competencies, the quality of which directly impacts the management model.

In a know-how company, decisions need to be made by the people who have the relevant knowledge, rather than the appropriate people within an hierarchy. This implies a much more distributed, networked structure and style in know-how firms, where power – and responsibility – should go with know-how rather than with hierarchy. Hence Human Capacity Building should be a major priority for any company that strives for competitiveness⁵.

It should be clear that the democratisation of the organisation *per se* will impact very significantly on how companies will be run in the future. The critical point: companies cannot own the source of one of their most important assets: human capital. This is particularly true of the high-technology environment because knowledge workers provide the essence of what makes high tech companies great.

Any holistic management model will have to develop innovative ways to involve workers, the providers of knowledge-capital, with opportunities to share in the financial wealth they create as well as having a voice on how and where that knowledge is applied. This is one of the greatest challenges facing companies in the defence and related industry, in genetic research and bio-sciences, the pharmaceutical and health sector as well as environmentally sensitive business sectors such as petro-chemicals, shipping, aviation, investment banking etc.

⁵ Internal communication Institute for System Health

2.2.4 From modernism to post-modernism

The post-modern world has evolved from the modern era. The modern era in turn is reckoned to have lasted from about the fifteenth century through most of the twentieth century. Modernism is associated in the West with the rational, scientific method. Most contemporary business leaders in high tech companies come out of the modern era and hold paradigms of those times.

The post-modern era which most younger and middle management leaders belong to, has a different mind-set. One of the characteristic features of post-modern culture is that opposite things can happen at the same time without being contradictory. Anyone who doesn't feel pulled in conflicting directions doesn't understand Heisenberg's uncertainty principle, Pauli's exclusion principle, and Schrödinger's wave equation. [279] Where the modern age was predominantly *either-or*, the post-modern world is *and/also*. De Bono [52], [234] and others like Leadbeater [232] have commented extensively on this post-modern phenomenon of apparent conflicting meanings. Or phrased more memorably by Leonard Sweet [246], "*the post-modernist always rings twice.*"

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In the foreword of the remarkable book Cluetrain Manifesto, by Levin et al [236], Thomas Petzinger of the Wall Street Journal states not surprisingly that "*business, at the core, is fundamentally human. Engineering remains second rate without aesthetics*". One may add that high tech companies that wish to ignore the trends and perceptions of a highly networked open global business space will not be part of this world for very long. Indeed, this is what makes the Cluetrain Manifesto so remarkable: it was written through contributions of hundreds and hundreds of people via the internet. [<http://www.cluetrain.com>]

In the Cluetrain Manifesto Levin et al argue "*most businesses only know how to talk in the soothing humourless monotone of the mission statement, marketing brochure and your-call-is-important-to-us busy signal*" [236] If today's business does not recognise the networked, multi-disciplinary, multi-faceted global markets it will only crank out sterile messages which neither customer, employee or supplier will accept.

Such organisations will simply die. Reading the 95 theses of the Cluetrain Manifesto [236] carefully will convince even sceptics that *“Times they are a’changing”* in the still true words of folk/rock singer Bob Dylan.

Such is the state of the world business finds itself in and it is equally clear that one of the major pre-conditions for successfully managed businesses will be the degree of personal mind-set management that the leaders and captains of industry are willing to engage in to get a handle on the increasingly chaotic, flowing, white-water situation.

To even just realise the incredible interconnectedness and the new nature of the challenges in post-modernism business, organisations will require new management approaches which in their basic form and structure –if such words are still applicable– will be partially unacceptable for modern mind-set managers unwilling to make the transition. The changing paradigms require of all managers and business leaders the need to become more aware and conscious of what really goes on in time and space with a scope much wider than their traditional thinking space. [308] [309]

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2.3 THE FUTURE AND RESULTING CHANGE

“Never mistake a clear view for a short distance”

- Paul Saffo, Institute for the Future

The world is in a state of flux...as indeed it has always been. Change is inevitable. Change is the essence of life. The difference today lies in the observations made by James Gleick [238] in his book *“Speed: The acceleration of just about Everything”* that *“since the days of the internet we are not just connected; there is not just more, it is different too. Time is subdivided into fractions of a nanosecond although we do not even grasp the meaning of a tenth of a second. The changes that happen at subatomic level in a millisecond from a physicists perspective are stupendous. In our daily lives we strive for the time precision but become increasingly disorientated when changes occur by the month week or hour. Chaos Theory understands that certain systems can undergo phase transitions such as water does when it turns*

coherently to ice or incoherently to steam". It is the same in the business environment: The system can undergo spontaneous phase transitions and involved people must cope and survive on the event.

Indeed, change and adaptation is the definition of life and if an organisation is viewed as a living organism, then only organisations that can adapt successfully to the tidal wave of change have any chance of survival.

Adrian Woolfson, an author from the life sciences, makes an interesting comment in his book "*Life without Genes*" [254] which is believed to be as applicable to a modern business environment: "*History only exists because the number of things that are possible greatly exceeds the resources of time and space available for their representation. Herein lies the tension that defines the essence of the process of life. Life is one huge resource allocation problem. But how is this tension resolved in the real world? Clearly a search and selection principle is needed. So life becomes synonymous with the process by which the mathematical space of all possible things is searched.*"

Similarly, in an age of unbelievable options and choices, rapid changes and a flood of available information, a useful management model must enable us to look at the business space as an open system and by means of a sound search and selection principle discern in the business environment the valuable from the useless, the urgent and the important, the relevant and the inconsequential, the macro and the micro and then proceed to make judicious decisions.

It is clear that under relatively static conditions changes are not perceived as necessary or even wholesome for the companies. Change can sometimes be unsettling, painful and always difficult but "*people worldwide recognise that it is time to begin to manage change or risk very serious consequences*" as expressed by Brian Molitor in "*The Power of Agreement*" [157] as the unprecedented rate of change in our world continues, most people and managers in organisations are simply swept along in its wake. Their destinies and those of their business are decided by the decisions of others. Many try old fashioned and unproductive

strategies when confronted by change. Some try to ignore change; others try to avoid it, still others try to resist or even sabotage it.

Under those circumstances it is also important to recognise that no single individual has all the power to create and sustain a positive change effort alone. Individuals or groups develop a vision for the business but they have to effectively communicate that vision to others who then agree formally or informally to buy into that vision and proceed in the new direction. The management leaders and followers then bond to form effective teams that accomplish the changes required in a practical manner. [1]

2.4 VALUE-BASED MANAGEMENT (VBM)

In the midst of turbulence and uncertainties in the business environment, many high tech organisations put their focus on certain key value drivers which consistently push the company to measurably higher performance. One of the biggest problems for management today is to convert the myriad of factors involved in running a business including the soft-issues, into tangible factors that translate into profits, into shareholder value, into sense and meaning for the individual working in the business and long-term sustainability. Large high tech companies such as Daimler Chrysler headquartered in Stuttgart, Germany, puts all and every single employee through internal, formally structured value-based management courses to achieve

- better understanding of underlying concepts in VBM,
- develop a common vocabulary and
- to translate the issues and trends into tangible value added actions at the specific workplace of each individual⁶.

Any contemporary management model will have to incorporate the principles of value-based management but not in a rigid, systematic manner but rather as a soft concept internalised by the employees. The difference in effectiveness lies in the implementation philosophy. The Daimler Chrysler approach to diffuse value based management principles throughout the whole organisation is done in a highly

⁶ Value Based Management Program conducted for and on behalf of Daimler Chrysler by the author

structured, enforced, formalised but life-less manner which in the author's opinion will have no lasting, really significant beneficial effect on the company.

The reason is simply that the culture of Daimler Chrysler as experienced by the author over a couple of months in 15 different workshops attended by over 200 design and development engineers, is not conducive at all to the philosophical concept behind value based management. Here the author was able to observe a formalised, well-structured training process to which the participants conformed but very few could move out of their rigid, behaviour-limited positions in the hierarchy to make it work at the place where they were active.

Predictably, the 2 year program was hailed a success by management after all 38000 employees had undergone the training. This in itself is a great accomplishment but finally it did not make Daimler Chrysler any more flexible internally or more prepared to handle the competitive business environment more effectively. Hence, the real underlying value-addedness of the concept was lost.

Value-based management has to be a dignified approach where people active in the organisation are enabled and empowered to initiate and implement value-based management processes, where such individuals are part of an ongoing coaching and learning process both for themselves and for others and where each stakeholder group can look forward to an increase in created value over time, relevant to their interests, materially as well as intangibly. This is valid for research-, design and development-, manufacturing- and even service organisations such as technical consulting. [2]

Value-based management thinking should be possible for everyone in the organisation and should transcend all business units, functions and hierarchies. All individuals that utilise and tie-up resources, financial and otherwise, must ask themselves on the economic return achieved. At the same time, the values under consideration have to be aligned with the vision of the organisation and be reflected in the operational actions at each workstation, no matter if the workstation is internally or externally focused.

In the case of Daimler Chrysler emphasis was put on the hierarchical addition of financial indices such as RoI (Return on Investment) to add up to an overall corporate-wide RoI. This required the painstaking identification of all value drivers at each position in the company with serious consequences of non-performance of the threshold RoI for that position. Each value driver in turn had to support the value drivers identified at a higher hierarchical level right up to corporate RoI.

The value drivers on the other hand were often defined in non-financial, but quantitative terms, while the financial indices were of course always defined in monetary terms.

Value must of course be defined as value in the eyes of the stakeholders of which there can be 10 to 15 different ones in a typical high tech company, each with a distinctly different relationship to the company: Employees, suppliers, customers, community, unions, banks, government, media, special interest groups (environmentalists, animal rights, pacifists etc), share holders, competitors and others. These do not all have the same interest or expectations from the company. Indeed, the expectations of the various stakeholders are often in direct conflict with each other.

- Example: *Employee – share-holder* in terms of money paid out; *customers – media* in case of defence contracts; *government – special interest groups* in case of tax income and environmental issues.

The concept of value creation as used in the title of this thesis must encompass value creation for all identifiable stakeholders of the particular organisation under consideration.

2.5 CONCLUSION

This chapter provides a brief survey of the contemporary high tech engineering business environment albeit in a personalised and hence subjective manner, but calibrated at certain junctures with available literature.

The diverse facets covered are by no means complete but serve only to paint a broad-brush picture of the complexity and contradictory nature of the contemporary business environment of high tech companies. Any leader – manager of such a company that wishes to achieve a sustainable competitive advantage whilst making a value contribution for all its stakeholders will be severely challenged.

The basis of this chapter and the broad literature survey of the next chapter provide the practical backdrop and academic reference to the enormous challenges posed to modern high tech engineering companies and its leadership which the proposed management model elucidated in this thesis will have to address.



CHAPTER 3 - ANALYSIS

*“In the beginner’s mind there are many possibilities. In
the expert’s mind there are few.”*

– Shunryu Suzuki – Zen Mind, Beginner’s Mind

3. ANALYSIS : INTRODUCTION

Management science is at least as much art as it is science. This is reflected not only in the diversity of approaches found in the literature [3] [5] [6] [10] [32] [34] [47] [81] [212] [285] [301] [307] [308] but also the approaches found in the many companies the author has personally visited and worked with over the years in many countries.

The scope of the analysis comprises a review of relevant literature spanning four decades with the emphasis however being on the nineties and the new millennium, their philosophical and cultural framework as well as the time-period of their publication.

These three conditions represent a significant indication of the approach to management in general. There is a clear historical movement from purely analytical (Taylor) to more intuitive and holistic approaches in recent times as exemplified by De Geus’ *“Living Company”* [16] and many others such as [40] [153] [165] [176] [178] [188] [202] [217] [221] [229] [236] [264] [282] [303] [304].

The researched literature in book form ranges from apparently absurd approaches [308] [222] [224], and paradox [8] [112] [170] [272] to highly individualistic or eccentric [50] [190] [211] [235] [239] [312] approaches. In brief articles of business magazines such as Fast Company, Fortune and Business 2.0 management methods and approaches are often suggested that are very much on the fringe. Today’s so-

called fringe could however very well represent the contemporary wisdom of tomorrow. The Harvard Business Review provides more serious and more contemporary material which is often highly conceptual and specialised. The Harvard Business Review articles can however, also be very practical, if discernment, judicious evaluation and adaptation is used.

Collected works from just one or two PICMET Conferences [180] [181] [182] alone makes so many suggestions to handle contemporary technology and engineering management that many albeit single-dimension management models could be conceptualised out of that material alone. How can the relevant information be extracted, tailored and utilised in a management model for the transformation of high tech companies in a practical, time-constrained manner while still ensuring competitiveness in a global context?

The sheer variety as well as the staggering volume of material available makes the integrative process for an all-encompassing sensible management model elusive. All sorts of approaches have been tried and each one may have been successful in particular circumstances as the above works attempt to convince the reader. However, none seem to have a generally valid, consistent and broad enough approach that may be applicable over a wide range of conditions.

3.1 REALITY CHECK - INTERNATIONAL LITERATURE SURVEY

3.1.1 Three decades ago

In a survey of the business and management literature of the last 25 years the changes, shifts and trends are most evident. Books like Principles of Management by Albers [33] (1969), and Shannon's Engineering Management [136] (1980) were typical of the recipe approach to management that certainly had its value in a relatively stable business environment.

A number of references [33][136][191][204][315] provide a relatively rigid and systematic framework of dos and don'ts in a largely autocratic framework of thinking that was developed for the mass production factories of the first half of the nineteenth

century. Most of these books try to *teach*, but leave little room for the Leitmotiv given at the end of Chapter 1, namely encouraging *learning and exploring* which is necessary in an unsteady, transient environment.

McCormack tried hard to elucidate the necessity for additional learning and exploring outside of academia in his work "*What they don't teach you at Harvard Business School*" [51] which was countered barely two years later by Kelly's work "*What they really teach you at Harvard Business School*" [31] in a fall-back to the then traditional approach.

Publications with a systematic but relatively inflexible approach have very limited value in the context of preparing high tech organisations for sustained value creation in the post-modern world. They do however elucidate some well-known management principles and are useful for the sake of completeness when considered as historical background. Their framework of thinking, rather than their content, makes them largely inappropriate for direct application in the contemporary business world.

Paradoxically, some of the *principles and techniques* elucidated in books such as quoted above and works like Howard [75], Pearson [103], Robinson [132] or Twiss [106] are no doubt still valid. But techniques are not the same as conceptual models and often techniques are treated as models. The framework of thinking, or mental model in which the concepts are embedded (mainly techniques) immediately give away their time reference of writing. Notice for example the difference not just in style and focus, but in approach between Peter [27] (1969), Gerken [62] [63] (1989) and Peters [309] (2003).

Project Management for example, is mainly a technique. However, how the project is managed in terms of effectiveness and within a project team effort that maximises innovation and knowledge transfer, conveys trust, openness and commitment, will not be found in the technique. [135] [187] [248]

Marketing management was also followed as a technique over many years as evident in works like [25] [48] [49] [65] [71] [76] [79] [80] [82] [83]. Marketing was compared to war strategies [77] [78] [48] and very much followed a recipe approach

until the 1990s when a different kind of approach to marketing became necessary in a globalised highly interactive and fast-moving world. [44] [63] [20] [188] [192] [193] [240] [242] [249] [258] [282].

What was 'state-of-the-art management thinking' for Drucker during 1966 in "*The Effective Executive*" [46] concerning leadership and "*Innovation and Entrepreneurship*" [45] concerning creativity, or even "*Mintzberg on Management*" [13] in 1989 was outside mainstream thinking and practical reality by the mid-1990s.

Not that the facts of how to run a business and its basic financial fundamentals had changed in principle, but the context and framework within which these principles had to be applied had changed dramatically. Society had changed as a result of new breakthroughs in technologies, the introduction of different processes and systems, the democratisation of interaction and communication and the way the individual employee, customer and shareholder perceived their priorities and values. The largest influence factors of the last three decades in terms of paradigmatic mind-set changes, were the social and industrial value-changes that took place in Western society from around the time of Woodstock and the Moon Landings. These had a direct influence on the way society interacted, within a cultural context, and subsequently resulted in new rules, processes and structures for the business world. In hindsight these influences are very clear although they were not necessarily planned or preconceived by anyone. [265]

The Woodstock event was an influence on management because it started a radically new wave of personal interaction, freedom in music and individualistic expression and was the beginning of the true democratisation and empowerment of the individual.[265]

The Apollo Program of the US space-race with the ex-Soviet Union showed an unprecedented ability to conceptually plan, organise and execute a highly complex and technologically unproven mission in the most hostile environment imaginable. The Moon Landings Program set free new intellectual powers, radical innovation, new processes of collaboration, innovative methods and techniques of testing and evaluation by means of the computer (hardware in the loop). It is no coincidence that

the progress of the US Space Program and the exponential rise of the digital computer happened in parallel. [178]

In turn well-known leaders such as Drucker [46], Ball [143] Iacocca of Chrysler fame [23], Sculley, successor to Steve Jobs at Apple Computers [29] and Goldsmith [30] certainly alluded to some of the appropriate issues during the eighties when they focused on:

- Vision as a practical and essential management element
- Knowledge management
- Leadership as in Executive Process
- Organisational Culture and Value System
- Value contribution

Drucker [46] focuses on the conceptual, Iacocca on providing visible leadership, Sculley [29] on change management while Goldsmith [30] concentrates on practical steps to achieve overall process effectiveness. Goldsmith focuses on winning:

- Winning through leadership
- Winning through control
- Winning through market orientation
- Winning through innovation
- Winning through integrity

Although the writers above seem to concentrate on the same relevant issues they approach them from an authority and control framework which was typical at the time. Iacocca [23] was the undisputed hierarchical leader, Sculley [29] the change-agent Goldsmith [30] gives lengthy lists of steps which tend to read like a recipe approach.

While such an approach certainly has some merit in the operational sense, it misses the injunction of such actions in the contemporary business environment of intense

global community, the virtual death of distance and the rapidity of communication and exchange of important information.

3.1.2 Focus on the Future

A book that broke with the conventional was Toffler's "*Future Shock*" [61] (1970) where much of the reality of today was predicted as general trends. Reading *Future Shock* again today makes one realise how much of the future an open-minded and alert world-watcher can perceive correctly in terms of trends and shifts. The precise details and keeping a score card of Toffler's hits and misses is not important. What is significant is that through the power of observation and reflective thinking in a truly global and system context many relational aspects come to light and can be projected into the future. Unless you believe Toffler had some divine or prophetic insight, he did no more than what the business leader of today must be capable of doing.

Toffler talks of the "Death of Permanence" and increased levels of transience, as well as an increase in speed and diversity of the future business environment. Thus he addresses the type of topics and issues that have become cornerstones of understanding post-millennium business. He emphasises that understanding the future and its possible impact on today, will form the foundation of good business management and leadership practices.

In the "*Third Wave*" [40], written 10 years later, Toffler focuses on the Eighties with its dramatic crystallisation of his previous prognosis. Naisbitt in the two books "*Megatrends*" [42] and "*Megatrends 2000*" [43] takes this prognosis further in each one of them for the next ten years. His approach is very similar to Toffler although interestingly he extracts his future scenarios more from sociological and political observations.

Ohmae of McKinsey fame in "*The Borderless World*" [44] published in 1990, perceives a future in which leadership is seen as a premium success factor and people being "*the only source of long-term success*". Although Ohmae sees a similar future business environment as Toffler [10] [61] and Naisbitt [42] [43] with all its

turbulence, instability and paradox, he in turn emphasises the need for global strategic alliances and positioning with respect to a future world order in terms of industries, countries and technology. Ohmae combines the people and leadership issues with strategic positioning for global competitiveness within a framework of macro-economic considerations. Capra [138] in *“Wendezeit”* provides a different slant on the changeability of society and technology and its influence on business management methodologies.

One of the publications that attempted to bridge the gap between modern-era strategic planning and moving to an opportunity-driven, one-eye on the future post-modern situation is given by Stacy in two of his works [101] [102]. In the book *“Dynamic Management for the 1990’s”* Stacy commences with topics such as Control, Planning and Strategic Management and then moves over to control by trial and error, making choices between closed and open-ended change situations and attempts to balance opportunism with planning. The book is highly structured, very analytical, but in the end Stacy succumbs when he expresses the sentiment *“Rational analytical processes may assist in posing questions and exploring some of the potential consequences of experimental actions, but the essence here is an intuitive, experience-based feel for the markets and the business, in which formality and regularity play little part. Indeed, regularity and formality are the enemies of intuitive, fast-acting responses, which cannot be based on forecasts because of the high level of uncertainty.”* [101]

Authors like Hamel and Prahalad came close to articulating a completely new paradigm with *“Competing for the Future”* [22] in 1995. They also emphasised the focus on the future and in the many ways it will be different as the Millennium loomed near. By combining Strategic Intent with concepts such as learning and thinking differently, transforming by imagining and shaping the competitive environment they built an effective bridge between the hard-core analytical approach and the softer issues in organisations. Furthermore Hamel and Prahalad’s book combines the strategic issues with an openness for exploring opportunities in the operational area and achieving transformation of whole industries in the process.

Today's business problems are characterised by a high degree of interdependency and interwoven-ness and are very systemic in nature. [86] [223] [243] This cannot be approached by addressing solely the parts, but requires observing the system as a whole. Applying purely mechanistic approaches to complex problems ends in defeat and frustration and is very often the cause of additional problems. [216] [227]

3.1.3 The Mechanistic World View

Our mechanistic world-view is based on a long, over 300 year old tradition which can be traced back to Isaac Newton and René Descartes in which logic, rationality, control and separateness constituted the predominant mind-set. The Newtonian-Cartesian model of nature as a well-oiled, efficient machine became the comprehensive world view which is still dominant today in almost all sciences, including economics, social science, medical science and psychology. [177] [270] Unfortunately board rooms of businesses, governing bodies of schools, hospitals and parliaments and even churches are still operated in accordance with those mental models. [246] [247]

It took Albert Einstein and other scientists over the last 50 years to show us that the universe certainly did not behave like a machine, although within laid down immutable physical laws. Quantum physics and a quantum-perspective of the universe and even ordinary observations in nature changed all that. Neither do living systems behave mechanistically as the life sciences and medicine seem to be discovering to their surprise. [250] [254] [276]

The interaction and operation of successful business organisations resemble living systems much more than the traditional hierarchical, control and command operated businesses. [16] [220]

The old mental model of modern times described the modern business as a sequential progression of business processes consisting of discrete, delineated components. In other words, the business model was represented by a complicated machine, which, when properly assembled and understood as a logical mechanism, would yield maximised results. The real world business experience is closer in

functioning to Heisenberg's uncertainty principle and quantum physics, is very complex by nature (not just complicated), its components are interdependent rather than in a simple cause and effect relationship, mostly non-sequential and for the most part highly unpredictable.

A perfect example of a recipe-approach in transforming organisations and also a widely accepted practice is Kaplan and Norton's "*Balanced Scorecard*" [17]. With the cleverly developed model it is possible in their words "*to guide current performance and to estimate future performance*". Within an already formulated Vision and Strategy for the organisation, they advocate a technique which uses measures in four areas:

- Customer delight
- Financial performance
- Learning and Growth
- Internal Business Processes

Knoblauch [293] has a similar approach by providing extensive standardised evaluations of a few categories that are deemed key factors. While the advantages of executing an evaluation in terms of benchmarking from time to time are without doubt, it is by no means sufficient to achieve the mental, strategic and operational agility required in a high tech business environment. More elements are required. Some of those elements may be intangibles in the sense that they are difficult to quantify or directly measurable.

In terms of a structured first order approach and in terms of asking some pertinent questions the Balanced Scorecard [17] does have its merits. If it is however used purely in a mechanistic sense, it is insufficient in scope for the challenges of the new millennium. The reason simply being that the contemporary business environment exhibits a very high degree of complexity which significantly increases the number of causality factors. A purely mechanistic approach is limited, follows a sequential rather than parallel path and will not capture the total picture.

Any technique or recipe approach to management can only capture what it already knows. This is an important concept and differentiates the new paradigm from the old. Much of our dilemma comes from the events and facts that we do not yet know or understand and which have largely undefined, unrecognised underlying interactions, or causalities. This type of situation has to be handled judiciously virtually without preparation by the organisation's management.

Sometimes techniques are adapted to a more contemporary framework such as attempted by Friedag [310] and Probst [311] both during 2001 when they modified Kaplan's *Balanced Scorecard* [17] (1996) to reflect a more modern, and possibly more personalised approach. In the end, it is however still a variation on a technique and as such of limited value in a holistic sense.

There are other publications that have considerable merit and provide a highly structured process, but which yield only an incomplete picture because it lacks system thinking and a completely holistic approach that can, in addition, adjust dynamically. See for example [143] [248]. In fact, almost all literature studied that was published prior to 1990 suffered that disadvantage while the system approach in the widest sense came into its own after 1995. Some visionary authors did however capture the essence of the new management approach early on: e.g. Capra [138], Kanter [108] and Mann [212].

3.1.4 Engineered in Japan and other Cultures

Due to the perceived success of Japanese industry and their remarkable global competitiveness, a number of authors that covered the "Japanese Model" were studied and analysed. Liker, Ettlíe and Campbell in *"Engineered in Japan"* [161] investigated a large number of best practices as utilised by Japanese companies such as Toyota, Hitachi, Toshiba and the like. They address the methodology of how Japanese corporations shape and build their organisational structures to encourage and support innovation.

Mostly concerned with technology management, the book by Liker, Ettlíe and Campbell attempts to define systems and processes which are in their nature not

much different from Western systems and processes of the same time period, but the integration of human capacity building into those processes is deemed more important in the Japanese case. James [160] as well as Emmot [159] tries to anticipate the demise of the Japanese global competitiveness in those circumstances and characteristics while people like Wickens [174] and Ishihara [162] elaborate what makes the Japanese management system / approach successful.

Having worked for extensive periods of time as a Consultant to Toyota UK and on an on and off basis for Nissan SA and Canon in Switzerland as well as in companies in a dozen European countries and the USA, the author of this thesis maintains that the Japanese model, as indeed all culturally-anchored management models, will fail eventually in a globally accessible, borderless, digitally connected business environment if simply transferred from one culture to another. This is strongly corroborated by Lewis [195] and Trompenaar [196] and van Peursen [194] who produced monumental works on the influence of national culture on business practice. In the light of this background the simple, almost cliché, but well known expression “think global, act local” is more profound than initially anticipated.

In terms of cultural interest, which is a very important parameter in post-modern management, Horsely [163] elucidates the cultural background of a defeated nation and looks at the characteristics that let Japan become a new superpower in the Eighties and Nineties. This may only be of passing interest, and yet paradoxically it is very relevant in the context of this thesis as it provides background to the mind-set for organisational culture shaped by a nation’s history and present-day perspectives and values.

As mentioned above some of the other works elucidating and relating cultural background for the development of effective management models are important to note: The most significant sources for understanding cultural diversity in business are Trompenaars’ *“Riding the Waves of Culture”* [196], Van Peursen’s *“Cultuur in Stroomversnellings”* [194], “When Cultures collide” by Lewis [195] as well as Ahrens [198], Gibbs [192], Bruce [197] and Friedman [237]. Hill’s *“We Europeans”*[193] is an excellent treatise to understand the different perspectives of a tribal Europe when it comes to management approaches.

National culture represents a set of general national values and the general way things are done in that culture. In turn, it has a significant effect on any internationally-minded management model. Hence, the consideration of culture in this part of the thesis is considered relevant for a completely integrated, holistic approach.

3.1.5 The Competitive Advantage

As recently as 1990, when Porter described his Five Point Diamond Model in his authoritative strategy work *“The Competitive Advantage of Nations”* [4] the world was still largely considered a relatively stable deterministic system, hence very much a mechanistic mind-set. With such a business model it is possible to completely understand the organisation’s environment and plan effectively for the future. In some industries the Porter Model may indeed still be generally valid. However, in a turbulent, rapidly changing, digitally-connected world, virtually no long-term strategic planning for the future is realistically possible. These rapid changes are in part due to the incredible technological transformations taking place, the fast dissemination of information and the effect this has on society, and subsequently business management.



As is often the case when the tide of change and paradigmatic re-orientation arrives, many people in business (and in life generally) tend to try to uphold the old order rather than to help to understand the new order and assist to get it born properly. In the author’s opinion it is not that Porter’s model is not correct, but the boundary conditions, globally-speaking, have shifted and Porter’s approach although correct in its facts, is necessary but not sufficient in the mathematical sense. At best, when utilised as a technique, it should be totally embedded in the contemporary time frame.

It is a waste of time to lament that managers are caught between a wonderful past and a dreadful future, or hankering after some unobtainable good old days. Maybe Gorbachev, more than any other person in our time with the exception of F W De Klerk of South Africa, could sense that changes are inevitable when the time for them has come. As Gorbachev has stated: *“We are witnessing a revolution of international*

relations toward increasingly open and mass-scale communication. And this greatly increases the role of creative and positive policies. But equally, it raises the price of mistakes – the price we must pay for outmoded adherence to dogmas, routine and old thinking...I'm convinced that we stand on the threshold." [177] This holds for any high tech organisation too.

3.1.6 Discernment and human issues

In 1990, Peter Senge in his book *"The Fifth Discipline: Mastering the Five Practices of the Learning Organisation"* [14] and [15] argues effectively for *"organisations to be more missional and even spiritual in terms of organisational development and business leadership. Issues such as Environment, Education and Ethics have become the banners of socially responsible companies. Being green in environmentalist terms and having the community at heart in the widest sense of the word are the new watchwords for business leadership"*.

Or as the writer Suzi Gablik put it in 1991, *"nothing which is not socially or ecologically responsible will make it out of this decade alive."* [256] Senge highlighted the demand for constant learning and encouraged mind-shifts to handle changing business environments effectively. By making concepts such as Personal Mastery, Mental Models, Shared Vision and Team Learning more tangible and relevant even in engineering environments, he created a new awareness and built bridges between the soft-science issues and the hard-science issues for the day-to-day business within a strategic context.

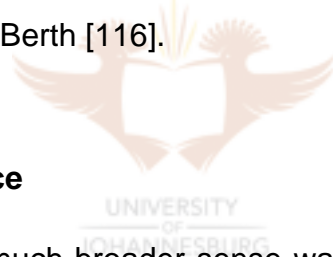
One of Senge's major contribution to the thesis model elucidated here, stems from the insight that to move from traditionally controlling organisations to an open-system, continuously reinventing learning organisation there were five new management technologies required:

- Systems Thinking
- Mental Models
- Shared Vision

- Team Learning
- Personal Mastery

The book *“Human Value Management”* by Fitz-enz [128] although written in 1990 already alludes to many of the important considerations that have to be considered for a post-modern management and leadership model. This work focuses on the important role the so-called soft-factors of human behaviour, emotional intelligence, competencies, skills and talent.

Other major contributors to this new type of thinking and who collectively initiated a paradigm shift are Goeudevert [211] [239], Von Oech [222], Freiberg [224], Leadbeater [232], Buckingham [251], but also De Bono [52] [59] who was years ahead of his time in the field of lateral thinking [53]. Other references for personal competencies in terms of the thesis context include Goleman’s “Emotional Intelligence” [231], Pehrson’s “Intuitive Imagery” [229] and in the German literature Höhler [117], Gerken [72] and Berth [116].



3.1.7 In Search of Excellence

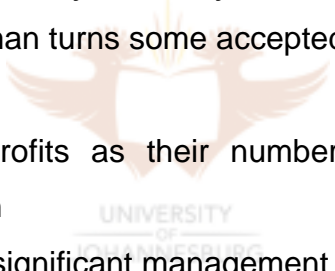
The great breakthrough in a much broader sense was no doubt the 1982 Bestseller *“In Search of Excellence”* by Peters and Waterman [35] where people other than Human Resources Specialists, expressed the thought that people-orientation and relational aspects of the business seemed to matter at least as much as the hard, tangible aspects of a business. *In Search of Excellence*, excellent companies were found to have the following eight characteristics,

- have a bias for action
- are close to the customer
- autonomy and entrepreneurship
- believe in productivity through people
- are hands-on and value driven
- stick to the knitting
- have a simple structure and lean staff
- have simultaneous loose - tight properties

of which only a few aspects appear to be non-biased towards soft-issues and people-focus in that it points the way to strategic intent. These eight characteristics have often been revised by Peters himself and emulated by other authors.

Peters in an article published in *Fast Company* during March 2001, a modern popular business management magazine, provided 50 aspects that modern leadership in business organisations must consider. Only the actual numbering of the paragraphs alludes to a structured approach; the individual points he makes are random and equipollent and illustrate the fluidity and equivalency principle involved in transformation.

Interestingly Tom Peters' co-author Robert Waterman published the book "Frontiers of Excellence" [9] in 1994 in which he says: "*What makes the best firms the way they are, cannot be attributed to such things as exclusive technology, a bright idea, a strategic asset...or even – especially- slavishly following the guidelines laid out in "In Search of Excellence"*". Waterman turns some accepted principles upside down:

- 
- Companies that set profits as their number one goal are actually less profitable in the long run
 - Leadership is the most significant management tool
 - People and human capacity building signify business core values

Waterman's book elucidates by means of numerous case studies that companies with a clear vision, with people who have bought-into the company's Strategic Intent, people who are able to share their intellectual capacity in a collaborative culture and who manage change through effective institutionalised leadership practices will find that the result is a sustainable improved bottom line.

Over the last two decades Tom Peters has brought the management thinking process forward by articulating in his peculiar manner the need to embrace chaos [95], to liberate the thinking [94], to innovate [218] and to constantly re-invent [309].

3.1.8 Reengineering and, if need be, Downsizing

Hammer started the re-engineering revolution with his *“Reengineering the Corporation”* [11] published in 1993 and this had a profound effect on many high tech organisations, at least in the USA. The big six consultancy firms stated that 70-80% of America’s largest companies had started re-engineering and committed themselves to this philosophy for the next couple of years. In his book Hammer says, *“Reengineering is the fundamental rethinking and radical redesign of business processes to bring about dramatic improvements in performance.”* [11]

In his work Hammer emphasises customers, competition and change to be the important breakthrough issues of the day. Note that customer emphasis implies value contribution, competition implies the sustainable long-term survival in a globally networked world and the ability to handle and adapt to frequent change, his third key point.

By the time Hammer brought out the follow-on book called *The Reengineering Revolution* [12] in 1995 he says *“In a world of rapid flux, organisations must change their priorities from a traditional focus on planning, control and managed growth to emphasise speed, innovation, flexibility, quality, service and cost. It is virtually impossible to retrofit organisations into this new reality.”* Hammer recognises and admits that the practical implementation of the Reengineering approach failed in the majority of cases. Why? He elucidates ten major factors that contributed to failure in the reengineering process all of which are soft issues:

- Don’t reengineer but say that you are – (Mind-set and Personal Mastery)
- Don’t focus on processes – (Understand the flow and drifts, recognise changes in processes and the larger business environment)
- Spend a lot of time analysing the current situation – (Over reliance on analysis of the past and it gives the illusion of progress)
- Proceed without strong executive leadership – (Leadership with far-sighted in-sight and multi-focus perspective that is alert, wise and committed)

- Be timid in redesign – (Gradual improvement and incremental change beyond a certain point tends to ignore the future. Stretch goals and radical change is what is required)
- Go directly from conceptual design to implementation – (Creativity to implementation requires innovation as a practical process)
- Reengineer slowly – (Change is a stately process; the more radical the more difficult because it involves real people)
- Reengineering with some aspects off limits – (holistic reengineering requires to look at the interdependencies and the myriad of causalities)
- Adopt a conventional style of implementation – (There is nothing conventional about reengineering, it is a venture into the unknown where speed, improvisation and iteration is more significant than detailed planning)
- Ignore the concerns of your people – (especially in the high tech area there are very smart and creative technical people that have their own emotional investments, concerns and developmental needs when change is about)

In the year 2001 Hammer has published a book with the title of “*The Agenda*” [295] which reverts to a road map approach to manage change. It provides practical implementation value and the principles are simple, but it tries to be a recipe approach nevertheless. The book is valuable for this thesis in that Hammer now attempts to be more integrative in his approach. The year of publication is 2001 and that seems to be the advantage.

The perspective has changed, although the paradigm of reengineering as the actual change management approach is still very much evident. These comments are not to be construed as criticism on Hammer’s work but rather as depicting a trend of even well-known authors and academics that shift their perspective, be it ever so slowly, to fall in line with contemporary business environment reality.

Although driven from the top executive level the process of reengineering must involve everybody in the organisation. That drive and especially the outcome will only be as good as the vision, strategy and leadership displayed from start to finish.

Communication and proper articulation of the reengineering process are key factors for effective leadership. [12]

Black [296] provides another perspective on change and how to manage it effectively in *“Leading Strategic Change”* by overcoming three barriers which are typical to change implementation.

- Failure to see the approaching change,
- Failure to move when change is evident and recognised as such and
- Failure to complete the change process in a well rounded off manner.

Downsizing is often seen as a financial reengineering effort but it is certainly not sustainable for repeated application in the same organisation.[209] In fact, downsizing as a management tool is one of the weakest and most ineffective management strategies as it leads to loss of know-how, trust and confidence for those remaining. Often downsizing is used mainly as a harvest-strategy and is at best a dubious management technique. Of course, if an industry has to undergo complete restructuring due to a new breakthrough technology or due to the appearance of a completely new market conditions may be such that some downsizing, as in retrenching personnel, is unavoidable. [107] Then excellent communication skills, credibility and trust become major leadership characteristics. Still, sustainability of global competitiveness and value creation in the long-term is the outcome that is desirable even under such conditions.

Lighter reading, but none the less providing valid metaphors in terms of change management and change per se are used by writers such as Johnson in *“Who moved my cheese”* [176] and Handy’s *“The Elephant and the Flea”* [280]. Books like Leadbeater’s *“Living on thin air”* [232], Gleick [238], Youngblood [264] and Buckingham’s *“First break all the Rules”* [251] give serious consideration to the many causality factors that influence our complex business environment. A few seriously challenging sources in this category would be Branson’s *“Loosing my Virginity”* [235] and Birkenbihl [285], Courtenay [242], Goeudevert [211] [239], Nasser [173], van Oech [222] and any of Maxwell’s many books on Leadership [241][245]. Authors like de Bono [234], Ward [287] and Low [305] focus on the more intangible issues of post-modern management and provide guiding principles rather than rules.

3.1.9 Living Organisations

The metaphor lies close that if a holistic approach to transformation is required that a valid comparison of a business or company could be made to a living organism. Two publications which make an excellent case for this type of perspective are Wheatley's "A Simpler Way" [220] and De Geus "The Living Company" [16]. Other works from different disciplines [250] [254] [276], support the insight that businesses function more like autonomous living organisms. Although autonomous, these organisms, like organisations are never the less highly interdependent on their environment and have the ability to re-shape their environment to their own advantage.

Wheatley's book [220] is remarkable and unique in that she provides a most powerful yet unstructured approach to achieving a working balance between human needs in the organisation and in its environment and the diverse business objectives themselves. This type of paradigm gives opportunity for organic growth and evolving new concepts. It provides an equal opportunity for intuitive approaches and structured approaches. Her organisational concept is well put when she explains:

"The universe is a living, creative, experimenting experience of discovering what's possible at all levels of scale, from microbe to cosmos. Life's natural tendency is to organise. Life organises into greater levels of complexity to support more diversity and greater sustainability. Life organises around a self. Organising is always an act of creating an identity. Life self-organises. Networks, patterns, and structures emerge without external imposition or direction. Organisation wants to happen. People are intelligent, creative, adaptive, self-organising, and meaning-seeking. Organisations are living systems. They too are intelligent, creative, adaptive, self-organising, meaning-seeking." [220]

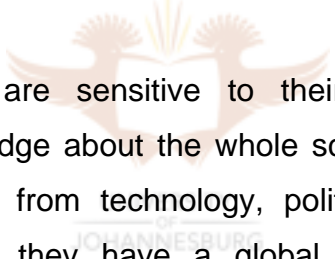
For the sake of this thesis the following concepts are extracted from Wheatley,

- The Natural world is inherently orderly. This World seeks organisation. It doesn't need us to organise it.
- We have a mechanistic world view of the universe and even ourselves.
- Life is attracted to order: whenever chaos appears, elements will combine,

groups form and systems of organisation appear. This order is gained by 'freedom of choice and exploring new relationships / possibilities.

- The contemporary business world is not amenable to being forced into a neat structure.
- Life is an experiment to discover what is possible.
- Life uses messes to get to well-ordered solutions. Life is intent on finding what works, not what's "right." It is the ability to keep finding solutions that is important; any one solution is temporary. There are no permanently right answers. The capacity to keep changing, to find what works now, is what keeps any organism alive. [220]

De Geus in his *"Living Company"* [16] provides a similar message but in a much more sedate manner, conditioned by years of corporate scenario planning at Shell. De Geus has his focus on the question of sustainability and longevity of the company. He makes the following observations:

- 
- Longlived companies are sensitive to their environment – they have information and knowledge about the whole scope of areas and factors that affect the organisation from technology, politics, business intelligence, to community and more; they have a global perspective of the business environment including cultural and societal issues.
 - Longlived companies are cohesive with a strong sense of identity – Everyone feels part of one corporate identity, no matter in which department or business unit they work or what they do.
 - Longlived companies are tolerant – tolerant to experiments, failures, and eccentricities within the boundaries of the cohesive firm.
 - Longlived companies are financially conservative – by being fiscally conservative, companies can pursue options their competitors cannot; they can grasp opportunities that arise suddenly and unexpectedly.

Interestingly the factors were not conducive to sustainability and longevity was profit per se and the size of the material assets. Profitability is a symptom of corporate health rather than an indicator of sustainable value creation over the long term.

Visionary companies display a powerful drive for progress that enables them to change and adapt without compromising their cherished core ideals. Such companies have a “soft-side characteristic” that although it implies nothing about their hard-side analytical competence, they are able to combine both very effectively. In fact in true system-thinking fashion, the hard and soft side combine in a manner that confirms that the judicious combination of the two is greater than the simple sum of its parts.

In De Geus words,

“To regard a company as a living entity is a first step towards increasing its life expectancy. Like all organisms, the living company exists primarily for its own survival and improvement: to fulfil its potential and to become as great as it can be.”
[16]



3.1.10 Leadership

When perusing the available literature on leadership of the past ten years e.g. Maxwell [241] [245], Wheatley [270], Blanchard [271], Dotlich [272], Hybels [292], Giuliani [306] it becomes clear that effective leadership has unanimously become one of the key transformation management characteristics, if not by far the most important one. Be it articles in the Harvard Business Review, e.g. the complete issue Vol 79, Number 11 December 2001; newspaper articles by The Economist, Time Magazine; be it articles in Business Magazines such as Fast Company’s issue of March 2002, Red Herring or Fortune Magazine, Leadership is an ever reoccurring topic of such publications.

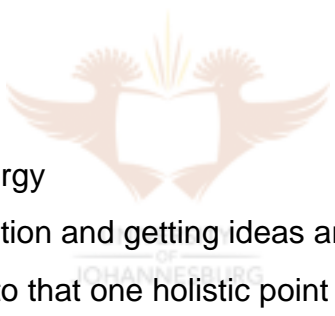
The same is noticeable in German publications, although a much greater degree of structured-ness is evident in Swiss and German publications and articles. Leadership

style and substance and especially its practical implementation have become a very popular topic of discussion on the internet by dozens of chat rooms and forums.

When discussing the one-major-challenge in large corporations it has been found by the author that even when top-echelon management attended courses and programs at all the important and prestigious institutions Europe and the US can offer, there remains a gap in terms of effective leadership.

Leadership coalesces the various challenges and brings them to a sensible, meaningful point, or vision, which everyone in the organisation understands clearly and people commit to in terms of their own role, function or activity related to the job.

White in his book *“The Future of Leadership”* [21] attempts to compare leaders to white water rafters who *“ride the corporate rapids”*. His book elucidates the following five concerns with leadership:

- 
- Learning from mistakes
 - Managing your own energy
 - Simplicity in communication and getting ideas and concepts across
 - Focus the organisation to that one holistic point
 - Intuition as a necessary (but not sufficient) condition in making sense of the business environment and making judicious decisions

Youngblood in his book *“Life at the Edge of Chaos”* [264] comes close in the author’s opinion to get a grip on many issues that have to do with uncertainty, instability and the issue of utilising intuition as a form of pattern recognition in an analytical, rational environment. Many others focus on the unpredictability angle of the contemporary business environment and draw leadership characteristics out of such a scenario: Dotlich in his book *“Unnatural Leadership”* [272] focuses on the leader’s ability to work in a complex, insecure and constantly shifting world with new technology and possibilities of new market niches that did not even exist last year. How to handle these dilemmas and how to think them through strategically in the fast-paced

operational scenario that most organisations find themselves in is the main approach of this book. The major tenet is to break the rules of natural leadership:

- Leaders are heroic
- Leaders favour results over values
- Leaders are practical and present-orientated
- Leaders are powerful
- Leaders do not fail

Dotlich states, “ *Leaders who rely on power, heroism and pragmatism will be ineffective in today’s business environment.*” [272]

Authors such as Kenneth Blanchard focus on the important aspect of mentorship and coaching [271] and [281] where leadership issues are concerned and Hybels [292] is a most up to date author who includes the spiritual side. People like Maxwell [241] and [245] in his “*21 Laws*” and Stephen Covey [165] [166] [167] in “*Seven Steps*” elucidate the Laws of Leadership in recipe format.

Recent articles in the Harvard Business Review of 2004 alone, such as “*Leading by Feel*”, “*The Seven Ages of a Leader*”, “*Putting Leaders on the Couch*”, “*What makes a Leader*”, “*Narcissistic Leaders*”, “*Understanding Leadership*” and “*Do Women lack ambition*” provide excellent research material that is sometimes multi-disciplinary in nature and taken into consideration in the proposed management model described in Chapter 4.

3.1.11 Modern Mavericks

There are entrepreneurs and business leaders who through their unconventional manner apparently did just the right things to become sustainably successful. Most of these people, like Branson of Virgin Group fame [235], Semler, possibly the ultimate *Maverick* in the book of the same title [50], Morita of Sony [28], Iacocca of Chrysler [23] [190], Sculley of Pepsi and Apple fame [29], Bill Gates [178], McCormack [51], Kelly [31] and Goeudevert [211] [239] have in themselves synthesised the correct

approach and possess a mind-set to create manageable order out of the chaos, uncertainty and immense flood of information within which they can still make judicious decisions.

There are important lessons to be learnt from their respective seemingly non-academic, un-structured, possibly intuitively-driven, yet repeatable and consistent management model. It is difficult, if not impossible, to capture the essence of each of the above-mentioned other than to express this ability in general terms such as courage, vision, leadership, whole-sight and in-sight. These Entrepreneur-Leaders seem to have the ability to translate their usually simple vision into a tangible strategy which in turn enables the people in their organisations to gradually transform the company repeatedly and sustainably under their effective leadership.

Obviously all the functional competencies must also be present in the organisation but they do not necessarily reside in the top leader. In summary, such entrepreneurial-leaders guide change and transformation very effectively and subconsciously carry out practically, what academics like John Kotter [19] [168] advocate conceptually.

This thesis is also about building the bridge between the conceptual models of Kotter [19] [168], Hamel [22] and Hammer [11] [12] [295] from an academic environment and people like Branson [235] and Semler [50] who execute these concepts in their organisations with their own personal style and insight. Practical, completely holistic academic management models were not found by the author, but there are many models which focus on parts or address some of the challenges and are excellent in their own right, but limited nevertheless.

3.1.12 Integration of many concepts in a multi-focus perspective

In the English-speaking world, surely the works of Tom Peters merit special mention, although some people will dislike his loud and somewhat bombastic approach. Starting with "*Thriving on Chaos*" [95] published in 1987, Peters articulates the onset of the management of positive chaos in the then contemporary business environment

with his still relatively structured approach of integrating the important characteristics of

- innovation at fast pace,
- achieving flexibility by empowering people,
- creating customer responsiveness and
- building leadership abilities to cherish impermanence –
- and to thrive on chaos.

In Peters' follow-up book released during 1992 called "*Liberation Management*" [94] he focused in on the necessity to periodically destroy your own organisation if sustainable value creation – i.e. global competitiveness – is to be ensured. The book itself is written like a quilt of patchwork and alludes to the real-world picture that emerged during the middle Nineties. By throwing together a multitude of topics and themes, case studies and anecdotal evidence for the incredible and fast-paced changes taking place he produced a relatively unstructured book that remains very close to reality. "*Thriving on Chaos*" and "*Liberation Management*" are probably the most scholarly business publications in the new world paradigm context because they expressed in a contemporary manner something the business world at the time only recognised as confusion and instability. Reading those two books today puts us right in the centre of any high tech organisations daily struggle and provides an unstructured-structure for those events.

Under such turbulent circumstances, "*anchor points are more useful than a framework, navigation by the stars is more useful than a road-map*" according to Sweet in "*Soul Tsunami: Sink or Swim in the Millennium Culture*" [246]. Sweet maintains in another book that seeing and perceiving everything in 3D is better than a "*one-eyed monocular perspective of the modern era which brings the world to a single logical point*" [252].

In 1997 Peters brings some of those aspects into a diffuse focus in "*The Circle of Innovation*" [218] which, although a more popular book than academic book, elucidates the idea of chaos, paradox and turbulence in a manner which is easily understood yet underscores the complexity of the management task. Despite the title

implying a single aspect of modern corporate management, it covers the complete management dilemma of high tech organizations that wish to create value on an ongoing basis in a highly competitive global world.

In German literature concerning this type of breakthrough-thinking of the early Nineties, Gerken [62] [64] [72] is probably the most influential. Gerken produced a monumental work with "*Manager: Die Helden des Chaos*" [72] which was as contemporary as Peters in terms of paradigm-shift and applicability in turbulent and unstable business environments but is nevertheless highly structured, very systematic and possibly more scholarly. Significantly, the subtitle of Helden des Chaos is "*When all strategies fail....*" It covers a wide scope of topics and themes to enable leaders to develop what Gerken calls "chaos-ability" as a competency of effective business leaders.

Gerken's work is an excellent source for providing effective leadership and developing strategic intent in an integrated, innovative multi-disciplinary framework. It is interesting to note that if one can understand the finer nuances of both languages, English and German, it is noticeable that "*Helden*" was written for a German speaking / German-thinking audience and will probably not convey the same exact meanings in English, even if expertly translated. Again the wider cultural context of the German writer (Gerken) is significantly different to that of Tom Peters and yet both are on the same track of the paradigm shift.

Not only do Peters and Gerken have different styles, but it is significant how the German approach differs from the US English approach, embedded as they are, despite both their global exposure, in their own national cultural background. Yet both come to the same outcome:

When markets have become global, evolutionary and chaotic, the rational approach of strategic planning, often depicted as competitive warfare where the emphasis is on dynamics and confrontation, has now been replaced by managing evolution and managing the occurrence of random events.

Both Peters and Gerken, but to some extent also others like South African author Grulke [177] [165], Levine [236], Moore [20] and British philosopher and business thinker Charles Handy [112] [113] [226] [288] and a host of referred-to articles in the Harvard Business Review, Fortune and Fast Company of the last three years show very clearly that a less defined, highly disordered (but not dysfunctional) approach is required in terms of a model to manage and lead high tech organizations through sustainable globally competitive value creation.

Unless business leaders, and especially those in the fast-moving high tech environment, change their thinking, their leading and implementing, in extraordinary ways, they will not meet the challenges of the future.

The wide variety of available material that was studied, the academic, the practical and the general literature such as business magazines, point to the same general concepts. These still lack a practical and holistic, yet conceptually sound and non-restrictive management model. To build a more comprehensive holistic management model out of all this, in line with the thesis title, will be attempted in Chapter 4.

3.2 COMPLEXITY – KEY ELEMENTS

De Bono in *“Simplicity”* [233] as well as in his later publication *“New Thinking for the New Millennium”* [234] discusses the differences between Simple – Complicated – and Complex in terms of the deterministic nature of simple and complicated, while complexity implies a host of factors in causal and a-causal relationships which are not easily recognised and incorporated in most management models.

A number of aspects make for complex systems:

3.2.1 Closed and Open Systems

Francis Bacon’s paradoxical statement *“whoever wants to control nature, will have to submit to nature”* [228] is getting an increasingly truthful ring to it and illustrates that open systems such as those we find in nature increase complexity. But the same is

true of any high tech business environment. The business environment is increasingly displaying the characteristics of an open system.

In the past companies tended to operate like closed systems: captured clients, stable industry, predictable markets, efficient manufacturing processes and product orientated marketing. This made detail planning possible and indeed formed the basis of all efficient organizations. The openness-character of the contemporary environment and its inherent instability has overturned those expectations and makes rational analysis extremely difficult as unpredictability also prevents detail planning.

The closed systems of the great factories of the industrial age are gone for good, due to rapid technological changes, the pace of business, the global networking and competitiveness, the democratisation of the knowledge worker and also the rapid border-less communication and transport infrastructure. The predictable closed system is replaced by unpredictable open systems and this leads to the increasing openness of post modern business thinking. If this thinking does not have the characteristics of system thinking it is largely futile from the thesis-title point of view.

3.2.2 System Thinking in Business

Probst [216], Müri [24] and more so Vester [227] investigate systems thinking and point out that with increasing complexity even *“system thinking becomes more of an art than a science in that limits of handling complex situations analytically are reached very quickly”*. Contemporary Systems Thinking in the words of the President of the Club of Rome Richardo Hochleitner is about *“recognising and manipulating reality intuitively, almost as an art form like recognising out of focus patterns.”*

Consider the diverse challenges of a high tech organisation: the conflicting stakeholder interests, the level of global competitiveness, the premium placed on good business intelligence and recruitment, maintenance and development of value adding human intellect, complexity of natural environmental issues, legislation and another couple of dozen aspects. This depicts a very complex, highly interacting and interdependent open system as our business environment. Hence, system thinking is

a pre-condition for the type of management model concept for the post-modern world as described in this dissertation.

3.2.3 Fuzzy Logic

The following paragraphs about fuzzy logic have been modified, but in the main they follow the discourse of Bart Kosko's excellent source "*Fuzzy Thinking*" [114]. The fuzzy principle simply states that "*everything is a matter of degree*".

Without controversy it can be agreed that the statement "Two plus two equals four" is 100% true. But when we move out of the abstract world of math, as is the case in management, fuzziness reigns. Fuzziness has a formal name in science: multi-valence. It is a blurring of the borders between it and non-it, between A and non-A, something management is continuously subjected to in the decision making world of real life. What holds for business and management can be found in the operation of the stock-exchange, in weather reporting, during the course of bringing up children etc. It holds for everything else it seems, except for the case of digital mathematics.

The opposite of fuzziness is bivalence or two-valuedness, two ways to answer each question, true or false, 1 or 0. Fuzziness means *multi-valence*. It means three or more options, perhaps an infinite spectrum of options, instead of just two extremes. The principle suggests a *three-valued* logic: statements that are true, false, or indeterminate.

Bivalence however, trades accuracy for simplicity. In engineering this is done when a model for a technical problem is developed: basic assumptions are made, specific boundary conditions specified and this is often enveloped in the comforting blanket of *all other things being equal*. In reality, electrical signals must be sampled and given values, or rounded off to fit them into a computer's binary mind of ones and zeroes. An audio compact disc with Beethoven's Fifth plays a smooth sound curve built or converted from 44,100 samples per second, but it doesn't play *what's in between*.

Western culture now sees binary precision as part of the scientific method. The digital revolution seems to have digitized our minds too. Aristotle's logic lies behind

our bivalent instincts, of course. Every well-formed statement is expected to be true or false, not true more or less or false somewhat. It is meant to be A or not-A. This approach runs through our language, teaching methods and specifically our thinking.

The fuzzier the answers, the more A or not-A looks like not-A and A. Let us depict this state of affairs as the opposite sides of a square, denoted as A and not-A. With this picture of a square kept in mind, when a group of people is asked the question of who is happy at their work place, maybe every hand rises only 50% and each person is as happy with her job as she is not happy, the interior area between A and not-A collapses into the square's midpoint. Then the thing A equals its own opposite not-A.

At the midpoint you cannot tell a thing from its opposite, just as you cannot tell a half-empty glass from a half-full glass. Bivalence holds at the square's corners. Multivalence holds everywhere else. Especially when there are ample quantities of information around. This state of affairs is typically found in a modern business environment.

Usually, more information means more facts. More information will better describe the facts. It will give us clearer pictures of facts from more angles and perspectives. But fuzz promises to be a permanent part of those pictures. In many ways the future looks fuzzy.

Our human neural system behaves like the eyes and ears of the system. It sees patterns in the data and slowly grows rules that relate these patterns. [http://www.frederic-vester.de] and [227]. The patterns are fuzzy sets and the relations are fuzzy rules. The fuzzy system uses these rules to reason with the patterns. As the realm of human experience and expertise is entered such a fuzzy system could then be labelled insight.

Ward in his work *"Universality"* [287] has this to say, *"The general success of our pattern spotting talents has consequences for human psychology. It has seduced us into believing that there is an identifiable sequence of events behind everything. Given that much of the world does follow a regular pattern, it is no surprise that we sometimes expect predictability and we get none. It is easy to be seduced by our*

success and assume we can take this pattern spotting to its limits and explain everything. It is assumed that given enough time, money and computational power and a dose of reductionism we'll work out all the particles that are involved as well as their interaction and we will unravel any tangled knot in this world."

Science and engineering seem to assume bivalence as true and yet often perceives fuzziness as not scientific. [114] Engineers tend to follow their analytical probability instincts as the closest relative to fuzzy thinking, but the business leader taking on 'sustainable value creation for the high tech company' can do very little with probability as it is mainly based on the past and normally says nothing at all about the future. The business leader or manager must make decisions on the basis of large amounts of information which is often inconsequential, and it has to be discerned in the fast-moving messiness of real life. Its causalities are usually not quantified.

Engineers just know more math and are thus more prone to determine the exact A or not-A to make a decision. Which is not necessarily a good thing under the circumstances as the calculated accuracy may be misleading.

Accuracy is clearly a matter of degree. The exact statements of math are always 100% accurate or 0% accurate, in other words they are true or not true. Statements about the world of business have accuracy scores *between* these two extremes. At root lies a mismatch problem. The truth mismatch: Logic: 100% true or 100% false. Management Facts: *partially true* or *partially false*. And never the twain shall meet. Just attempt to draw a perfect circle freehand.

"The real-life universe is thus not random. The universe of life is not deterministic, but grey. The biggest problem with grey events such as the behaviour of the stock exchange, organisational growth, management of people, earthquakes and avalanches is that if you reduce these systems to their constituent parts they lose their defining properties", as expressed by Ward [287]

Although science and engineering can demonstrate that the atom can be split and the moon can be walked by man, it cannot by analysis alone predict the fickleness of the NASDAQ, the preparedness of a labour union to go on strike and the day to day

events disrupting a high tech company's management. A type of order or disorder is evidently present, which engineering cannot always satisfactorily predict, smart and awesome as some complex engineering modelling may be.

Yet, fractal as it may be, the indeterminate daily events impinging on the organisation are the most pertinent aspect during the management of the transformation of a high tech company. Engineering managers are seldom warned, trained nor naturally competent to act in such a counter-intuitive manner. In fact, it flies in the face of engineering training which is naturally highly structured, well-defined by the underlying physics and every attempt is made to convey the need for accuracy and precision. For the new paradigm in management modelling required in the contemporary world, rationality is expanded to include experience, intuition, uncertainty and...fuzziness.

3.3 DYNAMICS AND EVOLUTION

3.3.1 Zeitgeist

There is no doubt that the contemporary era is distinctly different from 20 to 30 years ago. It is very different to 50 years ago and 100 years ago. It would seem that even the last 5 years have a different *Zeitgeist* than today. Certainly it appears that the waves of paradigmatic change follow on each other at ever shorter intervals.

Since September 11th, 2001 and the subsequent wars in Afghanistan and Iraq the *Zeitgeist* has changed not only the political landscape but also economics, oil and international trade and industry. The proposed management model will have to be valid and must be able to accommodate a number of shifts and trends of *Zeitgeist*.

3.3.2 Time and Space

High tech companies, more than perhaps any other type of organisation, will look at plausible rational explanations. Time and space are seen to be a continuum, based on impeccable analytical thought and cause and effect. Hence, the thought is near to plan and to extrapolate the future so as to produce a reality map.

Engineers are experts in mapping. However, every attempt to “draw a new map of reality” is really an exercise in lying...although it might also tend to get closer to the truth as it is refined. The title of geology professor Mark Monmonier’s book on maps, *“How to Lie With Maps”* (1991) [268], is playful. But it’s also true. Every map is, by definition, a lie: *“A single map is but one of an indefinitely large number of maps that might be produced for the same situation or from the same data”*. There has never been a map without omissions, concessions, and interpretations. A map is a grey fuzzy object at best. The main purpose of a map is to help you find your way. The map is not the way, however. It is this fact that is useful to recall when articulating a management model for an open-system, complex, unpredictable fast-moving contemporary business environment.

Margaret Wheatley, in her critically acclaimed *“Leadership and the New Science”* [270], argues that maps are the old paradigm of management. Complexity theory makes a mockery of maps. That’s why “re-mapping” almost always fails. “Re-engineering,” “restructuring” or whatever name “re-mapping” comes wrapped in, are the last gasps of the old rigid command-and-control models of movement. The death of the recipe approach to management.

In the modern world – in which most who are of the boomer generation grew up – one could assume a “steady state” universe. No longer. The post-modern post-millennium environment is ever-changing, fast-paced and unpredictable. In the words of Leonard Sweet [252], *“I fully expect to wake up to a different world than the one I went to bed in”*. In the opinion of the author this has never been more accurate than for the morning following the events of 11th September 2001.

Change is happening so fast, that it is difficult to really imagine the world of just 50 years ago, and with all the fast technological development it is hard to imagine what constitutes the next generation’s world. During 1990 the modern version of the World Wide Web was created by CERN in Geneva Switzerland. There is a new webpage published on the internet every two seconds, a new product hits the global market every thirty seconds. [<http://www.cisco.com/warp/public>] According to Time

Magazine of October 14th, 2002 there were billions of web pages on the net, of which the search engine Google accesses barely 4% for domestic use.

World knowledge now doubles every eighteen months, with more new information having been produced in the last thirty years than in the previous five thousand. [316] Decades are now measured in centuries and millenniums when one moves from chronological to cultural time.

No wonder one study of post-modern culture concluded with the observation by Rosenau [269] that *“the half-life of paradigms appears shorter and shorter as human affairs become increasingly complex”*.

It should be clear that maps cannot be created of *terra incognita*. It is not likely that maps can be consulted in a world where the *terra* is no longer *firma*. This analogy is equally valid for the contemporary business environment. In a fast-paced world with few familiar landmarks, exploring the new environment is the operating word for business leaders.

Post-modern business culture is virtually un-mapable on flat surfaces, as it is multi-dimensional. Such a complex and multi-dimensional interaction network which in addition is unsteady and often entangled in paradox cannot be reduced to simply two dimensions without losing significant information. It's more like *“a spider spinning a web,”* says Brian Shannon of the Corps of Engineers. *“You're moving back and forth, building something one line at a time until you have a complex network that captures a place”*. [318]

3.3.3 Tempo

Gleick's *“Faster: The acceleration of just about everything”* [238] gives us an indication that *“increasing wealth and increasing education brings about a sense of tension about time. We believe we possess too little of it. That is the myth we now live by”*. Top industry CEO's are hired on the basis of quick wits and they are hurried out of their wits as elucidated in the December 2001 and March 2002 issues of Fast Company magazine. In most high tech companies the nano seconds are of more

concern than the time spent on strategic reflection and solid intuitive and system thinking, often with disastrous consequences.

Decisions have to be made faster and faster on the basis of large amounts of information which cannot always be evaluated as to relevance, actuality, accuracy and trustworthiness of the source. The tempo of change, decision making and reviewing even strategy seems to have a built-in exponential function which makes it hard to keep up as a rational analytical manager.

3.4 CONCLUSION

The world has certainly moved to a stage of high turbulence, increased fuzziness, higher degree of complexity, increased paradox, high risk, high speed and little predictability, which at the same time exhibits a greater need for precise and relevant information for decisive action in less available time. As shown, the literature discussed over the last three decades reflects a shift in organizational thinking which grappled with the trends and changes observed. This includes the changing paradigm in high tech organizations as well.

The apparent chaotic and ambivalent nature of the high tech business environment creates

- uncertainty,
- high personal stress on almost all individuals,
- resistance to change,
- a falling back on familiar but outmoded and ineffective methodologies,
- a decline in competitiveness and eventual loss of market share
- an almost frantic search for models that are predictable, sequential and steady.

Models are always based on the assumptions of what is known and despite all the vast amount of information available to contemporary decision makers there appears to be less room for a linear management model than ever before.

If a recipe approach to managing a complex environment posed by a contemporary high tech engineering company is not applicable under such circumstances, a different

process must be found that can handle the apparent confusion, contradiction and uncertainty in a real-time manner effectively, if not efficiently. More so, the management model must enable an agile, ongoing, relevant transformation process in the high tech engineering company while satisfying multiple bottom-lines –not just financial- to add value to all key stakeholders.

With these issues in mind, based on the literature survey and the experience of the author, a holistic management model for the transformation of high tech engineering companies is presented in the next chapter. In addition, the suggested management model simultaneously attempts to cater for sustained value creation and global competitiveness.



CHAPTER 4 - SYNTHESIS

MANAGEMENT MODEL DEVELOPMENT

4. SYNTHESIS : MANAGEMENT MODEL DEVELOPMENT

4.1 INTRODUCTION

What this thesis advocates in terms of a management model, is a new perspective, a new attitude towards the management of high tech companies so that true transformation can take place. It is this new perspective of the global business environment coupled to a management mind-set which ties together the various conceptual parts of the proposed management model for the transformation of high tech companies.

The expression environment is used to mean the sum total of all the forces that affect a company's actions. The major significance is the fact that over the last couple of years the business environment has shown oscillations of increasing frequency and amplitude. These in turn completely reorient the corporate sense of purpose according to De Geus [16]. To meet the changing pressures on the company emanating from the outside world in its complexity and frequency will require adjustments in the internal structure and paradigms of the company. More often, the changes are fundamental in nature and require a complete transformation from top to bottom.

Some critical attributes the management model has to deal with are,

- Effective transformation
- The parts and the characteristics of the model anchors alluded to in Chapter 1:
 - The temporal relevance, i.e. time
 - the Business Space,
 - the Systems Framework,
 - the Process and
 - Integration.

- A framework with which it is possible to capture the above in a rational manner but with flexibility.

4.2 TRANSFORMATION

Any management model must endeavour to transform the high tech engineering company in such a way that the company can adjust profitably to any changes in its environment or internal situation. Transformation is more than transaction of course and is fundamentally different.

Most companies' management is involved in *transactional* activities such as administration, maintaining the status quo, planning, organizing and controlling.

Transformation implies change to a distinctive degree in terms of all the characteristics of a system or business. Transformation represents a determined effort to change the status quo, to inspire innovative approaches and to reflect on the future in terms what can be.

The required business transformation is in a sense radical: it resembles the metamorphosis of the caterpillar to the butterfly. Such transformation always implies the dissolution of the old structure and there is seldom anything in the new structure that resembles the old.

The trend to business transformation is of course not new and a number of publications over the last decade have struggled with coming to terms with the tremendous rate of change. Attempts at rational analysis and implementing solutions have resulted in the Re-Engineering Boom initiated by Michael Hammer [11] [12], Productivity Boosters in Factories [175] and revised Management Practices related to the behaviour of Greek Gods [202] , Attila the Hun [34], Wild Water Rafting [21] and some equally unlikely titles.

In the author's own consulting experience both international and local, many business leaders have not yet recognized the urgent need and the radical nature of

the transformation because they tend to fight current trends as enemies of order, or perceive these trends as destructive chaos.

A less radical approach preferred by many is to keep the traditional order and structures, but at the same time making it more efficient. Unfortunately, in times of transformation the change is so dramatic that the refinement of the current approach does not necessarily improve its effectiveness. Consistency and continuity in terms of structure are the least likely attributes to be found effective during the transformation. [177] Paradoxically, at the same time other aspects demand continuity and consistency: sustainable value management, branding, global and cultural empathy, quality and customer delight etc must be ensured.

All those who want to be business leaders involved in successful transformation have to be willing to let go or at least critically re-assess concepts such as continuity and consistency, because it is rooted in traditional power-base thinking, rigid hierarchical structures and related manipulation and control. Which is not necessarily wrong, rather it may be inappropriate for the times. [177]

Today, 'process' has become a much more important concept than 'structure'. A process is, by nature, dynamic and that is a reason why integrated multi-disciplinary teams can be more successful. In open and trusting multi-mindset teams the process gets adapted and refined continuously and it requires no external management. The famous Lockheed Aircraft Skunkworks [179] back in the 1950's and 60's represent some of the first experiments in this regard but although the global business situation today demands permanent skunkwork processes, these are still seen as the exception rather than the rule.

Over the past couple of years there has been a growing realization that norms and standards, long-cherished ideals and power-structures are crumbling, but it is not recognized as a natural and exciting evolution which is a consequence of the increasing interdependence of diverse technologies such as biotech, gentech, robotics, IT and the access to powerful computing technology.

The mind-set of many of those business leaders focuses on the power-structures, the hierarchical, the deterministic and validity of their traditional values. But the real business world is evolving in contradiction to such thinking.

In the high tech environment this is even more dominant because of the nature of the products and processes involved as well as the background and training of its individuals. Although engineers understand process very well, their highly developed analytical skills tend to search for order, rationality and predictability. That in turn promotes the illusion of control and corresponding behaviour.

It is interesting to observe that the more powerful the organization in its particular industry in a traditional sense, the less likely that it will notice or take the transformation dynamics taking place all around them, seriously. Those that do not themselves undergo the transformation in their own mind-set will not necessarily perceive the transformation taking place in the external environment right in front of their eyes.

The transformation in the external business environment for any high tech company is already proceeding at a high speed. For a high tech company to adapt, it will have to undergo an internal transformation which can only be accomplished if the leadership itself has undergone the necessary transformation in their own mind-set. Then they will recognize that the shifts and drifts of the environment can be manipulated only when they themselves are immersed in these turbulent shifts.

As a consequence, leadership can and must act faster than they can plan. Traditional top management prefers to have detailed plans to exercise control over things and define outcomes nobody can directly control, least of all top-management, but the employee in the frontline has the best opportunity, insight and feel to make the better decisions.

In analogy, the exact progress of a surfer on a wave cannot be planned, but action and reaction has to be flexible, has to be quick, and is decidedly not directed from the beach. The environment and the wave must be felt so as to be able to make judicious decisions.

Before the management model is discussed it is important to recognize:

- At this time a transformation process is already taking place externally to the high tech company and results in the dissolution of existing norms and structures
 - The result of this transformation of the external environment is a minimization of predictability, controllability and rationality
 - The individual must adapt in terms of perspective and mind-set to be able to cope and thrive in the situation whilst making a value contribution
 - Individuals will contribute in multi-disciplinary teams that continuously challenge existing systems, structures and process.
 - The transformation is an evolutionary process which orientates itself on perturbations and discontinuities in a network of very high connectivity.
 - The transformation is also an ever-ongoing process like a continuous renewal cycle
 - These aspects will result in a particular business culture which is characterized by trust, courage and innovation rather than turf fights, routine and continuity. Indeed, if the business culture is not transformative in nature, the high tech company will not be able to transform itself either.
- [308]

Of course, youthful enthusiasm, good intentions and a few additional management skills are insufficient to accomplish such a transformation but four aspects receive new impetus, meaning and relevance during the transformation process:

- Evolutionary, Just-In-Case thinking makes a more effective contribution than detail planning
- Self-Organising and Self-Correcting counter-acts the effect of accelerated pace and the disorientation due to frequent change events
- Chaos can be constructive
- Multi-Perspective and paradox provides a better picture of reality

The above indicates the importance of soft-factors and the emphasis to manage with innovative and imaginative flexibility in the transformation process. That innovative flexibility coupled to mature leadership will in turn cause better synchronization adapted to the vision of the company, better knowledge management and result in sustainable global competitiveness. In fact the quality of the leadership at all levels in the company should determine the effectiveness of the organization in terms of value-contribution, sustainability and global competitiveness.

4.3 THE FUTURE IN THE PRESENT

How the future is perceived determines to a large degree the actions in the present. The future is of necessity imagined, subsequently developed even further in the mind to make it more tangible, possibly by interacting with others. Eventually ideas and concepts will have to be implemented in the real world and tested for their practical suitability.

Most times the future just happens to companies because they focus almost entirely on operational aspects. Such companies react to events in the vernacular fire-fighting mode, instead of being pro-active architects of their future. Trends and shifts that determine the boundary conditions of the business' future are seldom addressed and much less reflected upon in a meaningful manner. If there are individuals in high tech companies recognising such changes in their environment, they are seldom given the opportunity to make their insight explicit knowledge for the rest of the organisation.

The proposed management model demands reflection. The proposed model demands inquisitiveness over a wide scope of activities. To give the proposed model a dynamic actuality requires a keen observation of trends in the industry, the local community and the global situation with respect to a large number of diverse factors. The proposed model assists in the integration of issues, factors and causalities over a wide spectrum of disciplines, over time and space.

The need for such a reflective approach represents an illustrative example of the intimate interrelatedness of most of the seven challenges of the proposed management model: a particular future for the business is recognised by an

individual, managed (Future Management) and is made tangible *inter alia* through the company culture and its openness to new concepts (determined by Leadership, Innovation and Personal Mastery), the way implicit knowledge is made explicit, (Knowledge Management), the manner in which resulting change is conveyed (Change Management) and how it will contribute in value to the stakeholders (Value-Based Management)

The future for an individual or the high tech company is initially always in the form of a vision. Although the vision is low on particulars and details, it is a powerful means of aligning everyone in the company. The simple example of British Airways vision of being “the world’s favourite airline” may sound trite and commercial eye-wash to advertising-wary individuals, it is however a better way of aligning the employees than a policy manual in today’s business world. This is only valid of course, if the other challenge-aspects of the system framework are in place. Within the right cultural and leadership environment where everyone has understood and bought into the corporate vision and where everyone understands the concept of values to the stakeholders different functions in the business, from the ticket office personnel, the baggage handlers and the pilots, do not require long lists of “how to” but they know what to do operationally to achieve that vision.

Naturally, there must be pilot training in place, there must be an efficient and effective baggage handling system and process in place, there must be an effective and safe maintenance process in place and there must be standard processes in place to issue flight tickets that are legally sound, accurate and consistent. But the existence of the processes alone will not make the company better or worse than any of the competitors. Every competitor in the airline industry has just about the same systems, but there are sound, innovative and excellent airlines and others teetering on the brink of death at least once a year. The difference lies in the perception of the future and what we have to do today to achieve that future.[224] A local airline such as kulula.com was successfully created, has sustained its growth and profitability and has achieved airline of the year status within 2 years of operations during a time of more conventional airlines are struggling to stay airborne financially. Kulula’s financially sustainable and competitive approach was different: Marketing-wise and operationally.

4.4 EXCELLENCE AND GLOBAL COMPETITIVENESS

Peters and Waterman's "In Search of Excellence" [35] was in many ways a watershed work in 1982 when it came to defining those attributes that ensured superior performance of any company. By reflecting on the improvement of practices, processes and systems, mainly in the field of manufacturing, companies achieved new levels of excellence, innovation and productivity.

Excellence was also connected to the expression world-class with the result that almost every company in the eighties equated excellence with world-class. Because of the loose interpretation of those expressions companies claimed them easily for themselves, irrespective if their products and services were actually successful in a global sense while contributing to the bottom line as well.

According to management consultant Brian Molitor in his work *The Power of Agreement* [157] there exist three main categories which a company has to satisfy to legitimately call themselves world-class which I have adapted slightly:

The first one is multiple bottom-line Indicators such as stakeholder satisfaction, quality improvement with respect to product and service, productivity improvements, security, managing growth and expansion, competitiveness and waste reduction. Each one of those indicators has a direct bearing on the financial performance of the company although the author would certainly add relevance of applied technology in the case of a high tech company.

A second important factor Molitor [57] mentions to which the author completely agrees is organisational longevity, especially as we are considering organizations operating in the high tech sector. World-class can only be evaluated over an extended period of time and technology generally has relatively long development cycles that are not static either. This is easily demonstrated by checking out the current positions of the world-class companies of 1982: 46% of the Fortune 500 companies of 1982 were gone off the list by 1991.

Internal excellence is a pre-condition for global excellence. A healthy organization which with relatively few dysfunctions can resist external events like an organism with an excellent immune system. Organisational health is thus a precondition for effective performance. This is true also for a high tech company.

The proposed management model must ensure organizational health, i.e. no major dysfunction in its internal organs and functions, so that the external threats and opportunities can be converted to excellence and competitiveness.

4.5 DETAIL MODEL DESCRIPTION

Even with the imperfect eloquence of the author it should be clear that a completely different approach has to be followed today if transformation of high tech companies with the expressed attributes of the thesis title is to be successful in the widest sense.

The proposed model has to cope with four distinct aspects which have to be applied in a collaborate fashion in the model. The four aspects are discussed separately and in series, yet the practical integration must be so complete that they diffuse into each other.



The management model must recognize the following four aspects concerning the larger business environment:

- WHERE: The co-ordinates in time and space
- WHY and WHAT: The context
- HOW: The process of repeated review and adjustment
- SIMULTANEOUSNESS application in an integrated manner

The four aspects could be called four sub-models and they are:

- The Business Space and the Times in which the transformation process takes place

- The General Challenges for a contemporary organization in a broad systems context
- The Process of addressing the Challenges repeatedly
- The ad hoc Integration of these sub-models

The Business Space reflects co-ordinates that change from time to time but also contains a stabilising element of choice due to strategic considerations and the specific industry of the high tech engineering company. In other words, the business space is reasonably stable but the characteristics of that environment must be well understood.

The time frame is by its very nature dynamic and lacks permanence in a fluid sense. Yet the timeline has itself a number of important distinctions to consider, in terms of predominant culture, trends and industry curve (i.e. early adopters, majority or laggards, Moore [67] [68]).

Mikhail Gorbachev observed after movements in the national consciousness had swept him from power, *“History punishes those who come late.”* So it is with high tech companies that do not sense the moving of the tectonic plates of environment, time and trends. Shake-free business due to the moving plates in the business environment is inconceivable. In all high tech engineering companies will be subject to major quakes. According to futurist Sweet *“The question is whether or not the high tech business prepares for the shakes that will come wherever and whenever one operates in the business space and on the time-line. It is of paramount importance to be aware of the directions the tectonic forces are moving”.* [253]

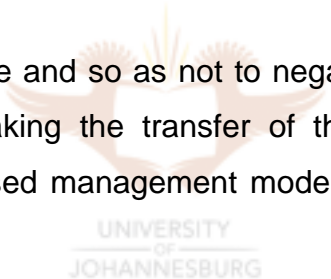
With so many aspects to consider the model needs some anchors for reference.

4.6 MODEL ANCHORS

For the sake of synthesis and understanding, the proposed management model consists of a number of separate models that have to be exercised concurrently on a highly integrated basis. As we know from the Introduction of Chapter 1, the biggest problem is that there are no simple models for a complex world. If the model were a simple one, it could not handle the complexity and most of the really pertinent issues would be lost.

Furthermore, the processes of real life and business processes in particular do not take place in an orderly mathematically constructed world although its tools are getting more digital by the day. Hence the daily confrontation with fuzzy logic in the business environment and the analogue real world is non-digital and represents the grey area where the management model still has to be applied. What is more, this application could be completely different a few years (months?) downstream.

For the sake of thesis-structure and so as not to negate the need for some order of construction conducive to making the transfer of the author's assumed implicit knowledge explicit, the proposed management model has a number of anchors, or fixed points.



A note on anchors is appropriate here. It is significant to note that anchors in the nautical world were developed to stabilise the ship in a turbulent environment. More so, it is interesting to note that in the old maritime sense the anchor was often used to pull yourself forward instead of locking yourself to a stable point. The picture is one of casting an anchor ahead, not behind, and then pulling oneself forward. This ancient sailing practice of using the anchor to pull a ship along was called kedging. It is in this sense of dynamic and forward-moving anchoring that the management model anchors are to be seen.

The idea of anchors in a dynamic sense has been expressed in different forms by a number of authors, for example Futurist Faith Popcorn:

Her book titled *Clicking* [261], outlines sixteen new trends, one of which she calls “anchoring” and defines as “spiritual exploration in which we ground ourselves by looking back at the past – to prepare for the millennium and beyond.” i.e. a pulling ourselves forward on some previously established hard point. This could be the business’ key competence, or the technology advantage it may possess or another key attribute of overwhelming competitive advantage.

Leonard Sweet expresses the same thought very elegantly in *Soul Tsunami* [246], a decisive work on church leadership for the new millennium, when he says: *“The blend of the venerable with the vogue, the well preserved with the pregnant, is our only security amid the uncertainties of the future. Like a flash in the pan the spirit of the times in all its complexity, chaos and uncertainty explodes into our daily management task. But a leader of the hour brings to a boil the spirit of the times mixed with the successes of the past.”*

Rudolph Giuliani, Mayor of New York during the catastrophic events of 9/11/2001 brought some of this out clearly and the key lessons learnt during that time are directly applicable to the engineering company’s daily struggle for survival and extraordinary achievement in the face of unprecedented adversity.[306]

The contemporariness, the dynamics, the daily changing situation, the globality of local events, the diverse mind-sets, perspectives and values due to the global culture all influence the course of the business in almost indeterminable ways. But just because some exact outcome is indeterminable, does not imply it cannot be managed.

The regularity and relative stability of the past made the time component of the management model, even if complicated, at least reasonably predictable, and in which a long term strategic planning mode was still possible. The term strategic planning certainly has become an oxymoron in the past ten to fifteen years, as strategy and long term planning do not go together anymore. The expression ‘strategic intent’ as coined by Hamel and Prahalad in *Competing for the Future* [22] would be much more apt and to the point in that it considers complexity and turbulence as the predominant influencing / constraining characteristics of any

contemporary organisation. However, in the proposed management model even the expression 'strategic intent' could be considered insufficient to describe the new evolutionary order of management; 'strategy' is seen as planning while 'intent' expresses vision.

Whatever is done in terms of a valid and consistent management model thus has to do with relevancy, insight and foresight. Insight is a mixture of discerning hindsight with passionate foresight, in other words our understanding of past events and their implications for the vision of the future. Relevancy has to connect to the times, the vision for the organisation and the compatibility of each individual in it, the actual situation in a complex set of parameters, doing the right things, recognising the trends and shifts and even the perception of the community, be it global or local.

4.6.1 Business Space

The position of the high tech company with regard to the business space, a three axis space with the dimensions Information, Knowledge and People, provides a first order assessment of a qualitative picture of the completeness and hence possibly the maturity of the company in all its multiple facets. The level of maturity would be indicated by the degree of coverage or volume, of the business space, awareness of the relevance of the respective dimensions and manipulating the relationships between the axes effectively and efficiently, i.e. the components that constitute the three dimensions Information, Knowledge and People.

In this business space the dimension **Information** includes all information about the company internally but also information and intelligence with respect to the external environment. It includes all information with regard to technology breakthroughs, political and social trends, competitors, customers, banking, and general awareness of issues, events, trends and perceptions that could possibly influence the company in any way, positive or negative. It comprises information at all levels within those topics and the above implies an awareness of large-picture issues as well as details.

The dimension **Knowledge** includes the level of know-how and expertise resident in the company over the broadest range of topics and aspects in terms of human

capital, technology employed, technology available, hardware infrastructure and the larger community it serves. The knowledge dimension here considered includes the diverse professional disciplines working in the company and outside it, their effective interaction and collaboration, interpersonal skills and degree of self-management of the personnel, propriety knowledge and patents, understanding the culture and hence value system of the organisation, the relevance and consistency of business processes employed ranging from introducing and developing ideas to new products, administration, marketing, manufacturing and invoicing to coaching new employees.

Importantly it includes not only factual knowledge but also implicit, experiential knowledge which most companies struggle to capture, if at all conscious of its distinct existence. Experiential knowledge to the level of depth and insight required for judicious decision-making cannot be captured in electronic data bases as much as expert systems may want to claim this. The most important knowledge of a business resides implicitly in the heads of the employees and although some are more eloquent than others to make it available to others, the transfer is never complete.

The knowledge-base includes the various company-specific line functions and the collective knowledge of a broad spectrum of geographical, political and cultural issues as well as the knowledge of how to effectively conduct interviews, open-minded discussion forums, knowledge exchange and whatever else is relevant or could be relevant to the company.

The **People** dimension is possibly the most difficult to assess because it depends on so many factors, many of which are embedded in emotion, feeling, perception and human fallibility. Broadly speaking it consists of the various aspects of human capital available, training, learning, researching etc in terms of functional competencies and personal competencies. It includes the placement of the right people into the right functions or roles and assisting them to find sense and meaning in what they do.

All this and more takes place in a balanced and dignified manner that once again has to support the value based management part of the strategic and operational framework. Furthermore this dimension includes the fuzzy aspect of willingness of people to co-operate, to follow the leadership and to work towards the articulated

vision and within the financial model of the organisation. Whilst at the same time the same people are open to new ideas, critical concerning desired outcomes and not anxious to be controversial from time to time if changes and trends are perceived that could be threats or opportunities.

Every business is located in a particular time and space. The time line on which the business space moves is in a certain sense non-linear and can often be discontinuous, conceptually speaking. Examples for the latter would be an event such as September 11th 2001, the invention of the transistor, leading to microchips and computers, or the demise of the ex Soviet Union under Gorbachov.

The company operates in a certain set of circumstances in its particular industry, as well as a specific political and social environment. The technology environment is more difficult to locate and pinpoint in terms of relevance and strategic importance. Sometimes a new technology can arise that makes the current business redundant if the new trends are not recognised in time, e.g. typewriters, record players, radio valves, slide rules to name but a few of those items that caused the demise of many a leader in their field.

Sometimes changes in the application of technology in a particular discipline can nevertheless provide a new and sustainable competitive advantage in another industry, e.g. e-commerce for large industries such as Mining, Automotive and Refineries, courier services for high-value product delivery, medical diagnosis and surgery via satellite and robotics, airship transportation of bulk cargo etc.

Time as well as space also has a significant and often discontinuous influence on processes. Examples are current trends, international relations and perceptions which can alter the marketing approach and process, people's personal preferences to travel or not to travel as part of their work, geographical locality of the company or personal values influences the hiring of human capital and expertise to a never known before degree. Industries such as related to defence, the tobacco industry and industries related to world opinion (animal rights, environmental issues etc) represent important parameters in time and space. Such industries can be subject to tremendous discontinuities in their business space due to new perspectives or

insights or simply due to an unanticipated event which completely upsets the current order and planning for that business or industry.

In figure 1a the company is strong on the Information axis but has little relevant know-how other than that pertaining to gathering, storing or disseminating information and is not very interested or active in the people dimension. An example may be a company that is focused on large data bases with little interest who the users, employees or the benefactors are. Often the IT section in a large bank displays this division of the business space.

Figure 1b could depict an organisation with an excellent knowledge base and due regard to the people axis but totally out of touch on the information dimension. Consider information in the sense of trends and perceptions, cultural movements and an awareness of what is happening in their environment. An example could be contemporary mainline Christian churches or a high tech company making an excellent but obsolete product. (e.g. manufacturing the perfect slide rule in the year 2003)

Figure 1c depicts an organisation that is totally people focused but has little in terms of special knowledge or an awareness of the information floating around in its environment of activity. Such an organisation could be very creative and truly care for people, internal and external to the organisation. A typical service organisation where knowledge is not all that important could be an example.

It is clear that the companies depicted in the business space of figure 1a, 1b and 1c do not achieve a good balance and indeed lack the multi-focus that the effective and a sustainably profitable company requires.

A mature company will be equally aware, pro-active and successful in all dimensions of the business space. Depending on the degree of maturity in its leadership and staff the business space occupied could be the smaller sphere or the bigger sphere of figure 1d.

4.6.2 Systems Framework

The suggested systems framework part of the model was developed to provide challenge-anchors and which represent the broad challenges which every business has to address. Three of these challenges are strategic and three are operational in nature. A further special challenge spans the complete framework in a superordinary sense. The latter is the value based management component in which every action, function and process in the business must be measured against.

Based on the foregoing chapters and the author's own consulting and coaching experience in diverse organisations internationally over many years, it is suggested that the seven challenges set out below encompass the pertinent aspects of sustainable value creation of a high technology organisation. These challenges are by their nature timeless although the content will change from time to time. As a concept these challenges are to a large degree circumstances-independent too.

The essence behind this management model which makes it unique and novel is that it does not describe or dictate processes, systems and structures in a check-list or recipe format for any number of different possibilities, always being valid and true and with a predictable outcome. Rather, the idea is to

- visualise the high tech company as a living organism that adjusts and evolves as a constantly adapting organisation in a continuous, dynamic fashion through learning and un-learning. It does so by harmoniously interacting with its current business environment and always searches for the most efficient manner of survival. There exists a sensitivity to the business environment at the macro and micro level, internal and external, with regard to present and future trends which strives to make it effective and
- visualise the organic entity called the high tech engineering company as a networked, self-regulating, self-healing system in analogy to the human body. If the networking in the company is effective, if the organisation is self-adjusting to external stimulus and perceived trends

and if the company is self-healing in the sense of learning from its mistakes and failures, the organisation exhibits system health and to a certain degree displays maturity, vitality and a bias for action.

- a preparedness of the company to discard ineffective paradigms and practices and to learn new ways of “what works”, in a holistic sense. In other words effectiveness and efficiency are not maximised at the expense of other pertinent factors in the holistic paradigm, but rather they are optimised for longevity of the organisation and for maximum flexibility. This is where the term *sustained value creation and competitive advantage* is alluded to in the title of this thesis. Note again that effectiveness precedes efficiency and that a non-maximised effectiveness is a better proposition than optimised efficiency with poor effectiveness.

A paragraph such as the above is counter-intuitive in a high technology environment. Hence how can such a concept be made tangible? One answer could be a framework of challenges which are of wide scope and unrestrictive in their interpretation, which always have to be met by any globally competitive company where in addition the full consequences of the thesis title are practically realised.

Out of 15 years of multi-nation, multi-industry, multi-discipline consulting and workshops on business transformation at senior level, seven closely interlinked challenges have been formalised by the author:

- How to think about and visualise the future and how to manage that future judiciously in terms of scope and detail.
- How to articulate the required change that has to take place in the organisation in an evolutionary or sometimes in a revolutionary manner and how to manage that change or transformation process.
- The critical role of inspiring and providing effective leadership in the very analytical, predominantly knowledge-based high tech environment

- How to assess the knowledge base and how to manage that knowledge to the best holistic advantage of the organisation
- How to encourage creativity and innovation so that it makes a course-changing, productive and sustainable contribution, repeatedly.
- What do people, interacting with the company and its stakeholders on all levels, bring into the organisation so that symbiotically each person derives a meaningful return of their own investment, commitment and energy.
- Lastly, how does each single contribution that is made daily organisation-wide, large or small in the context of the six challenges above, add in terms of value to all stakeholders?

It should be clear from the forgoing that only a revolutionary, innovative approach to management and leadership that is not constrained by the mental framework of the great management thinkers of the last 40 years may provide a temporary here-and-now solution. Temporary because the framework of thinking changes every couple of months, influenced as it were by politics, economics, natural disasters, man-made disasters, new technological breakthroughs and a host of other seemingly unrelated factors. Of course this is also industry-specific as the software industry has shorter lead times than the aerospace industry.

The expression here-and-now implies that a universally applicable *approach plan* is required which is low on specifics but high on process. It is high on fuzziness, yet definitive in execution; high on intuition and of equal standing to analytical considerations. Based on all the bigger picture issues elucidated in the first three chapters, it is clear that a management and business framework, which itself must be flexible and transient in nature, has to be developed for the transformation of an high tech organisation.

By listing the major challenges posed to a contemporary high-tech company under the broadest possible headings the major way-points for the process of transformation and global competitiveness can be found.

These are defined as three strategic aspects, namely

- Future Management,
- Leadership,
- Change Management

and the three operational aspects namely

- Knowledge Management,
- Innovation and Creativity as well as
- Personal Mastery.

The equivalent strategic and operational aspects must be carried out in the context of the seventh one:

- Value Based Management.



4.7 SEVEN CHALLENGES

The seven challenges of the proposed management model have to be handled simultaneously and this is to be accomplished in a broad systems context, hence the term systems framework.

Diagrammatically this is shown in figure 2 and consists of the following challenges,

◆ Future Management

This challenge considers aspects of vision, trends and scenarios which affect strategic leadership for a dynamic, complex and open system organisation operating in an open system environment. It is concerned with how the future is perceived, the place of the business within that future and how to manage the course to that future.

◆ Management of Change

Managing change is one side of this challenge. But to initiate change and to help shape the future by means of effective implementation is the concurrent second challenge with regards to change. Furthermore the change –anticipated or current –

has to be managed in a systems thinking context. Understanding and developing the change agent as an issue, system or person and identifying the most ideal change manager characteristics are just some high level considerations. Simultaneously initiating change and managing the resultant stress in the different aspects of a modern organization is a highly complex task and just complicated. [260]

◆ **Leadership, Vision and Strategy**

The challenge of appropriate and effective leadership conveying a vision which is conducive to the formulation and implementation of a tangible competitive strategy usually falls on the top management person. Such a person must articulate and promote a holistic, global and contemporary management and leadership concept, where leadership is multi-focused, institutionalised and where paradoxically leadership conforms to the attributes of “servant-leadership”; this mix of leadership attributes encourages experimenting, learning and coaching within a company culture of sustained value creation where people can experience sense and meaning for their own lives.



◆ **Know-how Management**

Intellectual and proprietary property have become highly significant in today's competitive globalised world. This is especially true in the high tech engineering field. Know-how has to be cultivated, protected and yet disseminated in a manner that allows a sustainable competitive advantage. Know-how management concerns the transfer of tacit knowledge to explicit knowledge so as to increase value creation in the company. It also concerns the transfer of that knowledge into tangible benefits for the end customer. Knowledge is based in people's heads and not so much in hard-drives and reports. As such it becomes a people issue even when discussing systems, processes and relationships. Production, finances, human resources, quality management, customer relations, marketing aspects as well as experiential knowledge of the individual will all fall into this elusive challenge.

◆ **Innovation and Creativity**

This includes understanding and leveraging processes of innovation, utilizing employees' potential and appropriate knowledge application for the purpose of sustainable value creation. Innovation and creativity is closely related to the company

culture and the attributes of leadership in a catalytic sense. Innovation and creativity are characteristics of every person, even if it be to different degrees, but the promotion, unfolding and practical utilization of such innovation is a great challenge.

◆ **Personal Competencies and Personal Mastery**

Defining and developing appropriate functional and interpersonal competencies in terms of the so-called softer skills is a challenge for every individual. Mature self-management and self-knowledge are preconditions for a balanced approach to a large variety of diverse and sometimes contradicting stress factors: intellect and intelligence, emotion, intuition, leadership characteristics, sensitivity to task and people, effective and appropriate communication, mentoring and facilitation competencies. These challenges have to be handled in a framework of finding personal meaning and balancing all aspects such as work, family, sport, cultural and spiritual activities.

◆ **Value-Based Management**

Value-based Management ensures that every function and activity is evaluated in terms of the value-contribution it makes to some stakeholder of the organization. This periodic assessment is not done on the basis of some structured recipe-type process but is a self-assessment by the individuals with mentorship-support if and when required. It can be done through a formalized process which often consists of the financial parameters, but there are also many values which are not financial: customer delight, environmental issues, quality of life of the community, health, security and even media perception.

The seven challenges derive from a need – cause – effect relationship which is another underlying network which constitutes part of the management model. The multi-layer, multi-focus, multi-disciplinary, often unpredictable, paradoxical, concurrent nature of the management task demands a high degree of flexibility, sensitivity and awareness of dozens of factors and issues. Such a task demands excellent personal self-knowledge, intelligence, maturity, personal balance and confidence as well as assertiveness with humility in the person charged with transforming any high technology company.

A person that is illiterate cannot imagine and cannot participate in the opportunities and insight possible that conventional literacy, i.e. reading and writing, can bring. A computer-illiterate person misses out on many aspects of contemporary life and such a person is cut off from the potential and opportunities of the future where computers are as ubiquitous and essential as motorcars today. Similarly, the seven challenges of the management model can be considered as essential modern global business literacies without which the post-modern manager of any organization cannot function effectively.

Literacy is something that takes years to acquire and to master. Some can utilize it magnificently and develop and grow exceptionally becoming great writers and speakers. To transform a high tech engineering company effectively, sustainably and competitively requires a high degree of mastery of global management literacies which takes years of experience, awareness, experimenting, learning and unlearning. By recognising the seven challenges of the management model as essential literacies, points to the necessity of complete internalisation in the manager and the daily execution of these literacies.

The seven challenges of the proposed management model must not, however, be perceived simply as intellectual bullet points which must be addressed one at a time to ensure success as a high tech engineering company. Rather, the seven challenges must be handled in a completely integrated fashion as part of the engineering company's effective transformation to a sustainably globally competitive organization.

4.8 INTEGRATING THE CHALLENGES

Only if all seven challenges of the management model are considered by virtually everybody in the organisation, in the sense of internalisation and personal commitment relevant to the level and position of the individual, and considered *concurrently* with an unbiased mix of rational and intuitive thinking, exceptional alertness and commitment, can the company be sustainably globally competitive in the long term.

This may appear to be idealistic, but it is achievable when there is a relentless commitment in living it out daily, especially by example through the top-management

team. As an international consultant the author has observed that this is indeed the case in the truly successful companies but it is seldom based on a single person or a singular action. It is an ongoing challenge fraught with highlights and pitfalls, with failures and recoveries.

It certainly strives for an ideal which will still be seldom enough achieved because

- life is messy and not everything can be formally integrated and considered concurrently,
- an organisation consists of flesh and blood fallible people who will not operate like automatons and
- because totally unexpected twists and turns in the larger business environment will occur and upset the course of action, not to say the unpredictable universe of events when seen on a global scale.

Figure 3 shows the gradual progression of organisational design from strictly hierarchical, to business units and matrix towards a co-operative network. If the people of the organisation are seen as networked individuals with roles rather than functions, an even greater flexibility can be achieved. Hence, Figure 4 depicts the practical real world interaction of knowledge workers that co-operate in a culture of trust and achievement. Such an apparently simple model, but which is highly complex in terms of interaction, can now be placed over the Seven-Challenges framework in Figure 5.

When it comes to the objective of this study the proposed management model will consist in essence of an Approach Plan embedded in a framework of
Need – Cause – Effect
as depicted in figure 6.

The term Approach Plan alludes to the fact that it is possible to plan, but that the plan is likely to be changed as time progresses. Not only in planning detail but also in fundamental structure as new opportunities and threats appear on the horizon. Hence the model emphasises approach embedded in a rather flexible structure, or framework.

A **Need** exists which requires awareness of the larger environment, its opportunities and threats and makes sense for the envisaged future of the company.

It requires sensitivity to the **Cause** of aspects such as leadership, vision, economics, mentoring, knowledge management and how to promote constructive innovation.

The desired **Effect** is found in aspects such as market position, customer delight, systems and processes, profitability and financial growth as well as finding sense and meaning in what the company does on an individual basis.

If the individual parameters of figure 7 are perused from right to left as a type of Functional Block Diagram with their respective identification numbers in parentheses, what is required to achieve the blocks on the right by the one adjacent left and those in parallel can be assessed, i.e.

to achieve the **Effect** of a specific market position (1)

- Requires Profit & Growth (2)
- Requires Customer Delight (3)
- Requires Cost Effectiveness (4)
- All in parallel with cultural empathy (5)

This in turn has to be preceded by **Causes** such as Creativity and Innovation (6)

- Requires Intelligent Systems (7), Processes (8), Productivity (9) as part of Knowledge Management
- All in parallel with Quality of Processes (10) and wise Intervention (11) by management.

Wise Intervention (11) is furthermore established by constant relationship building (12) over all levels and disciplines.

- Requires excellent mentorship (13)
- Requires commitment for Championship (14) by top management
- Requires an easy to understand executable financial model (15)
- Requires an articulated Vision (16)

- Requires consistent mature imaginative leadership (17)

The expressed **Need** to initiate the **Cause** and **Effect** has to be recognised in multi-dimensional form:

- Requires the full exploration and deep understanding of the Opportunities, Threats, Strengths and Weaknesses (18) of the high tech engineering company
- Requires accurate, relevant and timely business intelligence (19) once again in a multi-level, multi-dimensional form
- Requires an acute Awareness (20) of what is going on internal and external to the company, politically, economically, culturally, globally, technologically, awareness to trends and shifts with literally hundreds of causalities. Most of these causalities are probably of no consequence but the total awareness is a pre-condition for everything to the right of that block.

In parallel, spanning all parameters are effective Communication, Culture (21) and ongoing Personal Development (22), so as to develop excitement, motivation and commitment. These determine the willingness of each individual to develop and extend the required competencies, promote their talents and build up their skills.

To achieve such an effect calls for considerable maturity in self-management by the leadership and the propagation or development of such characteristics in every individual in the company. This represents an excruciatingly difficult set of circumstances, the details of which defy structure and classification. To function effectively under such circumstances is contrary to the training philosophy of many technicians and engineers, but also as found in medical or business school. Therein lies the biggest challenge for high tech ventures, for business in general and for this thesis in particular. Almost all the factors are soft-factors which make them the hardest to learn, to develop, to implement and to use as standards in a tangible manner.

4.9 IMAGINE – SHAPE – DELIVER - SUPPORT

This part of the model shown in figure 8 emphasises the continuous cycle of renewal, re-thinking and reflecting on what is possible: Possible, in terms of future opportunities, new technologies, new trends, strategic re-positioning etc. To *Imagine* is a process taking place in the mind. Like the imagined structure of a new system, structure or conceptual model.

Subsequently the thought has to be converted into something tangible and must be made visible for others. The mind-picture in the individual or even a group of people like top management must now be given *Shape* in the form of a drawing, a specification, a plan.

At this stage in the process there is still no actual change or implementation on the ground. A specification is an essential component of a project or concept, but the material realisation of the system and its practical implementation is the aim of the previous two stages in the renewal process. To *Deliver* means bringing about the change, to cut metal, to manufacture, to put down in reality the imagined and shaped concept. To *Deliver* also implies completion and proper project closure.

Support alludes to the fact that most projects, even when realised in practice and concluded successfully, require ongoing support for the idea, maintenance, logistics or ongoing training and marketing, if the system is to be utilised over its complete life cycle.

The above four points of the renewal process are not new and are, in fact, an integral part of a proper system engineering approach. High tech engineering companies should be very familiar with this process. The application of the renewal process in the transformation of high tech engineering companies has much wider implications. In such a situation the renewal process requires the application to non-technical issues which, in the observation of the author, technology companies struggle with. In the framework of the seven challenges of the management model and a well-understood business space for the particular organisation under consideration all possible aspects, relationships (with stakeholders), causalities and even personal

developmental needs have to be subject to the renewal process *Imagine-Shape-Deliver-Support*. This process has to be seriously considered by the top-management of the high tech engineering company in regular frequencies but also in an ad-hoc fashion whenever a new situation, opportunity or threat arises.

The practical implementation of this process is essential for a healthy organisation but only if done in a consistent, intelligent manner under the championship of the leader and the top-management team of the high tech engineering company.

4.10 INTEGRATION

Each one of the sub-models is necessary but not sufficient on its own. The most important characteristic to achieve is a concurrent and parallel application of each sub-model. As depicted schematically in figure 9, the ideal to achieve is the simultaneous application of as many aspects and parameters discussed in the context of this management model as possible to reach a Sweet Spot at the conceptual intersection. The Sweet Spot depicts the perfect coming together of a variety of attributes, facets, considerations, systems, efficiencies and personal talents competencies and experience conceptually. The size of the Sweet Spot is a quantitative indication of the harmonious balance and effectiveness, possibly vitality, of the organisation's activities.

For a high tech engineering company to be effectively transformed for sustained value creation and global competitiveness requires a simultaneous consideration of a large multitude of diverse factors. Many of these factors and issues are fact based, many more are intuitive, many are based on innovative, possibly radical, changes. Much is analytical, much is based on reflection yet it has to be implemented practically with optimum effectiveness. Added to this scenario is turbulence, paradox and impermanence.

To be effective in as many dimensions as possible can be accomplished within a holistic framework with complete integration only and requires exceptional maturity and competence of the leadership.

4.11 APPLICATION

The *practical* application of the presented model is not easy, but certainly feasible. It is problematic in that the business world, the world of technology, stakeholders and a host of other issues are non-steady phenomena and similar to *aiming at a moving target from an independently fast moving platform*, to use terminology from the defence industry. [317]

The *successful* application of the proposed management model is also not a forgone conclusion. It depends on a myriad of factors and issues, many of which are transient, as was articulated in the foregoing chapters. Personal experience by the author has shown that a meaningful transformation can take years, will primarily depend on the personal characteristics of the leader, will depend on the particular industry and the competitive pressure on the organisation. Indeed, the successful effective integration of the pertinent factors may already be superseded by new circumstances a few months later.

Companies in South Africa, organisations in Western Europe and the United States attempt to implement parts of the model by means of different, but difficult to distinguish methods which often depend on the local culture and history of the business. Business success, if it is achieved at all, can be fleeting and momentary.

A limited survey by means of a questionnaire sent by e-mail to a number of large high tech companies and to university course participants, seems to support the complexity of this endeavour as well as confirm the experience of the author.

The applicability of the model is assessed through two to three day workshop and post-graduate programmes presented by the author locally and overseas and analysing their response to the same survey. Hence the feed-back from engineers engaged in the management process of transformation that attended such programmes would collectively have assessed the applicability of the presented model. The number of engineering managers who have participated in such programmes in groups of 15 to 40 participants is in excess of 1400 individuals from all over the Western World.

To attempt to assess the applicability of some of the aspects of the proposed model, a survey was sent to 463 companies in South Africa and overseas the results of which are discussed in chapter 5.

4.12 CONCLUSION

The proposed management model is itself complex due to a) the multitude of interdependent parameters that have to be considered concurrently and repeatedly, b) due to the many causalities involved and c) many of which are not always apparent, but rather concealed.

The management model consists of a loose framework of concurrently applied sub-models, but is not to be applied in a recipe mode at all. Rather, given the holistic picture of the vision in the high tech company, the proposed management model relies on the mental agility of leadership and the committed buy-in of all stakeholders and is re-shaped with every operational working day. The management model is closer in attributes to a mind-set, than to a procedure.

Paradoxically, the framework of sub-models of course also resembles a structural approach by its very definition, but in application it relies on dynamic relationship behaviour and continuous assessment between the various aspects under consideration rather than functional and sequential interactions.

The management model relies on the intimate, intense and dynamic relationship of the high tech company (personnel, systems and processes) with its larger environment (all stakeholders and shifting circumstances) embedded in a mental model given by the framework of sub-models, characterised by the wisdom, talent and skill of the leader or collective leadership of top-management. It also recognises the importance of the time frame and *Zeitgeist* in which the high technology company must function in a healthy, i.e. effective and efficient, manner.

Likewise, the seven core challenges provide the anchors for the business' orientation. The seven core challenges incorporate all relevant aspects of strategic and operational importance for the company whilst providing an economic return.

The holistic business parameters as another sub-model point to those parameters that have been shown to form a value chain for a healthy organisation. By addressing each parameter in the seven challenges as a matrix approach with appropriate knowledge, insight and wisdom the business can grow, develop and prosper.

The repeated re-visiting of all identified aspects and parameters on a regular basis is mandated by the shifting trends in the business environment, including economics, technology and processes. The judicious application of the sub-model *Imagine – Shape – Deliver – Support* thus ensures a careful examination of assumptions and observations in real time.

Finally all these considerations, reflections and actions have to happen concurrently and, ideally, at the Sweet Spot of the leaderships' perceived talent, competency and wisdom. Only then will the model provide a sustainable means to continuously transform high technology companies into globally competitive and healthy companies.

CHAPTER 5 - SURVEY OF GLOBAL COMPANIES RESULTS OF AN E-MAIL SURVEY

5. SURVEY OF GLOBAL COMPANIES : INTRODUCTION

People from different parts of the world teach managers in the high tech engineering environment and the wider business environment different things. Learning must be encouraged no matter where the lessons originate.

Although the author maintains that he has enjoyed ample exposure to diverse international high tech engineering companies to make general statements about management and business thinking, at least in selected Western World environments, it was deemed prudent to obtain some feed-back even at the risk of it being subjective. A questionnaire was put together in English and in German and sent by e-mail with an accompanying letter as shown in Appendix A.

The selection of companies was made in a manner based only on three criteria, i.e. companies involved in the technology field as well as size in terms of people and turnover. The questions were basic and relatively simple to answer. The purpose was to find a quick assessment if the author's perception of the importance and relevance of the challenges was in fact congruent with the perception in the field.

The resultant feed-back from respondents is to some extent subjective and it was not attempted to analyse statistically in detail. A statistical analysis has not been presented although enough detailed data may be available to conduct further research on the topic if at a later stage more specific objectives concerning the validity of the management model have to be investigated. The nature of the survey undertaken, is currently intended to provide some trends and thus is more indicative than conclusive.

5.1 THE QUESTIONS

The questions were selected to cover all seven challenges of the management model and were formulated as follows taking due cognizance of the research methodology presented by Cooper and Schindler. []:

1. My organisation is well aware of global trends in our and related industries.
2. My organisation re-positions itself frequently in line with those perceived trends.
3. A changing external environment results in significant changes in attitude and mind-set in management and in our staff.
4. In our organisation, we have an effective change-management process in place to facilitate transformation.
5. Most people in the company clearly understand the long term vision for the company.
6. People are excited by the vision for the company's future.
7. Change is handled proactively by our leadership and experienced positively by most of our personnel.
8. To position our company correctly for the Future, we promote trust, professionalism, excellence, personal integrity and being fair & supportive of people.
9. Innovation and creativity is often based on "intuition".
10. The knowledge base of our organisation lies mainly in the heads of our employees.
11. Personnel is selected not only for expertise and knowledge, but also for special talents and creativity.
12. Your direct superior acts as a coach and mentor to you.
13. You act as coach and mentor to your subordinates
14. You get time and opportunity at work to think and reflect about doing your job more effectively. (compared to perpetual crisis management)

15. Introducing a truly innovative idea in the work environment is actively supported and promoted by management.
16. Personnel receives tangible recognition for introducing new ideas.
17. Our company puts more emphasis on doing things right than on doing the right things.
18. I would like more opportunity for personal development so that I can execute my job more effectively.
19. Value-based management in all its facets is actively pursued in our company.
20. The company is achieving an economically sensible Return on Investment.
21. The individual can relate their activities with the overall financial goals of the company.
22. Marketing our products and services is the role of the Marketing & Sales people only.
23. A pro-active customer orientation is reflected in all parts of the organisation by most personnel.
24. Technical work achieves equal recognition with management work in our company.
25. My own value to the company is enhanced regularly through opportunities of formal & informal development.
26. The financial bottom-line is the only bottom-line that counts in our organisation.
27. Most people actively identify with the common vision for the organisation as expressed by top-management.
28. My contribution in my present position gives my life sense & meaning: My efforts "make a difference".
29. Two-way communication is open, honest and frequent.

30. People are encouraged to “experiment” to increase the value for all the company’s stakeholders.

Respondents were asked to answer on a 5-point scale if they strongly agree (5) or strongly disagree (1) with the statement given. Although the questions are pertinent with regard to the separate seven challenges of figure 2, they are never the less only indicative. The purpose of the questionnaire was to assess if the perspectives of the author in terms of *emphasis* and *relevance* was in line with successful high tech companies. Accurate mapping or overlapping of viewpoints was not attempted.

Two separate surveys of companies were undertaken-

- Survey 1: of 328 questionnaires sent out to a diverse group of technology companies both in South Africa and internationally, 250 in English and the rest in German, only 27 in total responded. Overall this effort was carried out over a period of almost 10 months and the tangible response was rather poor (8%). This constituted the first group, called Group A.
- Survey 2: a second attempt was made by sending the same questionnaire to participants of the author’s past workshops both in South Africa and overseas as well as to post-graduate students in Engineering Management that had been subject to the same material as the workshop participants. Here the response was much better with 82 responding out of 135 e-mails sent out (61%). This constituted the second group, called Group B.

The difference in the e-mail response of 8% versus 61% could be ascribed to the questionnaires of Group A being addressed to strangers; i.e. people that were unknown to the author while the members of Group B all had a direct personal experience of the author in a facilitation or lecturing context. As the responses were solicited by e-mail there is a large chance that many of the Group A addressees did chose not to respond as the e-mail was considered spam or suspected to be virus-prone. It is also conceivable that Group B was able to recall the major learning lessons of the workshops / classes and to have had a personal identification with the author. Group B was on average younger than the participants of Group A and hence

it can be assumed that many people in Group B were at a lower management level in their respective companies.

5.2 COMPANY SELECTION AND APPROACH

The selected companies of Group A were all relatively large companies, especially those based in the USA, but also some in Germany and Switzerland and perceived by the author to be successful in terms of market share and financial growth.

A company was considered large when it employed in excess of 1000 employees and / or showed a turnover in excess of US \$ 100 Mil. Fortune 500 companies are typical for that category although other companies were also included in the e-mail list.

Addresses for Group A were gleaned from the Fortune 500 listing in Fortune Magazine, but also other business publications as well as websites of what were considered suitable companies. Others were due to personal contacts made in various countries where the author has had occasion to facilitate workshops or give seminars. The persons addressed via e-mail in Group A were mostly unknown, often not even a name was available, their position in the company hierarchy was seldom transparent and e-mail receipt was seldom acknowledged.

Every effort was made in the letter accompanying the questionnaire to instill professionalism and academic credibility. It is suspected, however, that much of the e-mail from the author was perceived as spam or junk mail of some sort as the author was also an unknown quantity on the recipient's screen.

5.3 SURVEY RESULTS

The raw data consisting of the answers to the questionnaires (given in Appendix A) are shown in table 1 and 2 for Group A and Group B respectively in Appendix B. The questions have been shuffled in the questionnaire with respect to the seven-challenges. Table 3 shows the questions and responses ordered according to the specific core challenges:

- C – Change Management

- F – Future Management
- I – Innovation and Creativity
- K – Knowledge Management
- L – Leadership and Vision Management
- P – Personal Mastery
- V – Value based Management

The table shows percentage-based values for all questions for the Groups A and B respectively for the purpose of comparison as the numbers of responses vary.

The results of table 3 were now arranged further per each one of the seven challenges. To facilitate visualisation these indicative results were presented in graphical format as well. Further attempts to quantify and analyse the data were not made as indicated in paragraph 5.1 already.

The purpose of the survey was not to obtain a full statistical, but rather an indicative comparison, even if it be to some extent subjective. It could be recommended however, that as an outflow of this thesis, a larger number and well formulated questions concerning the seven core challenges be formulated and presented as a more detailed statistical analysis. Some attempt to rework some of the current data statistically may provide further using bits.

The survey data processing is limited to comparing percentages with respect to the different question categories (core challenges) and the two groups and is deemed sufficient for the current basic model assessment purposes.

5.3.1 Processed survey results

Table 4 shows that on the aspect of Leadership and Vision, the two groups were reasonably in agreement on the agreement side of the evaluation while the differences are slightly more pronounced on the disagreement side. Group B is on average a younger generation and the group that had been exposed to the author in a post-graduate university course environment. Age was however not specifically asked in the survey and as such cannot be stated with certainty. As such, the

younger Group B possibly sees the leadership and vision challenge in their respective companies in a more polarised fashion. Upon closer inspection of the numbers for taking together the values of strongly agree / agree versus disagree and strongly disagree this difference, however, disappears.

Table 5 depicts the same representation methodology for the Future Management challenge as defined by the seven-challenges model. Here Group B has a much higher assessment value in terms of agreeing that their companies seem to make a distinctive effort of managing the future; 37,5% for Group B versus 28,9% for Group A. Overall both groups are much more positive in this category than negative, in the sense of agreement or disagreement: i.e. 59,2% Group B, 51,8% Group A versus 28,3% Group B and 27,3% Group A.

Table 6 shows the picture for Change Management. Group B shows more agreement while Group A indicates a less positive response. The differences between Group B and Group A are 10% on the agreement side as well as 10% on the disagreement side but on opposing ends of the spectrum.

The above three challenges of tables 4, 5, and 6 represent the challenges defined as strategic in the management model. They would appear to be more positive in the Group B with respect to the companies and individuals involved.

Table 7 represents the responses for Knowledge Management, the first of the operationally defined challenges. Here the Group B once again dominates on the agreement side while Group A dominates on the disagreement side, each dominance being around 10%.

Table 8 looks at the Innovation and Creativity challenge and again Group B seems to place a higher value on the in-agreement side than Group A albeit not as high a difference in this case. 51% Group B vs 46% Group A.

In table 9 Group A is about 9% points more in agreement than Group B. Possibly this may be an indication of a higher maturity and experience level in Group A as these respondents came from significantly larger companies with international exposure.

Value based management is important to both groups as can be gleaned from the 56% and 55% agreement results of Groups A and B respectively in table 10. In a sense this particular challenge is the only direct link to finance and economic considerations of the seven challenges. There is thus a greater sense of awareness of the need to produce economically even though the other six challenges are more soft-factor based and often rather intangible.

The results in the case of six of the seven challenges seem to indicate a stronger agreement perspective of Group B: this could indicate a) more optimism of a slightly younger group, b) influence of the author on those of Group B due to the interactiveness of his workshops and classes or c) the companies in Group A are larger, foreign and the management teams are probably of a more senior age group.

Table 11 shows the response of both groups with respect to every individual question. Table 11 provides an overall trend on the in-agreement side for each question and is indicative of the generally more positive side of Group B in their assessment of their respective companies.



5.4 CONCLUSION

The survey was carried out to determine, to some extent in a subjective manner, if the proposed management model is in line with currently held management approaches and philosophies, both locally and internationally. It is recognized by the author that the particular 30 questions posed to a group of managers at various indeterminate levels in a wide spectrum of corporations will not necessarily yield rigorous statistical data and conclusions. This was not attempted. Literature and daily practice already indicates considerable validity of the approach taken by the proposed management model and the survey(s) seem to confirm this view in a manner that is a quantitative starting point..

Although the survey was not meant to be exhaustive, rigorous or even conclusive, it does however confirm that in contemporary management of high tech companies with an articulated strategy and vision, awareness and intuitive parameters play as

much a role as functional, rational factors. This is recognized by a significant number of the respondents to the survey and supports the approach taken by the author in the articulation of the proposed holistic management model for the transformation of high technology engineering companies for sustained value creation and global competitiveness.

Future work may include a more comprehensive survey with a resultant detailed statistical analysis where further specific parameters as well as criteria for evaluation are again rigorously defined.



CHAPTER 6 - CONCLUSION AND RECOMMENDATIONS

6. CONCLUSION AND RECOMMENDATIONS

6.1 THESIS SUMMARY

The objective of this thesis was to provide a new integrated model to transform high tech companies for sustained value creation in the context of the post-modern, globalised and highly competitive business environment. A new paradigm set in a holistic and system thinking framework had to be found to articulate a new management model.

The need was perceived that high-technology companies require a value-creating business leadership and management model which demands a completely holistic approach to achieve sustained growth in the contemporary turbulent post-millennium business environment and where the company and its environment is seen as an open system. Such a model must be able to incorporate soft and hard issues, strategic as well as operational aspects and be practical in the sense of implementation and sustainability.

It was shown in the thesis that the need for such an approach is apparent, the complexity and intransigence is evident and that conventional, recipe-type approaches will no longer necessarily ensure success.

Attributes such as applicable knowledge, appropriate skills, core competencies, technological astuteness and fiscal insight and many other competence factors have been assumed as given in a given high technology business. The absolute need for these hard factors' presence is of course a pre-condition for an effective, sustainable, globally competitive high tech company, but it is far from sufficient.

The proposed management model elucidated was supported by a comprehensive literature overview, the author's own practical experience as well as a survey by questionnaire of a large number of international management personnel. The comprehensive literature overview was deemed necessary as so much of the basic assumptions about how business operates and is managed have changed paradigmatically.

The world has certainly moved to a stage of high turbulence, increased fuzziness, a higher degree of complexity, increased paradox, greater personal freedom especially for knowledge workers, high speed, high risk and little predictability, which at the same time exhibits a greater need for precise and relevant information for decisive action in less available time. As shown in Chapter 3 and elsewhere, the literature discussed over the last three decades reflects a shift in organizational thinking which grappled with the trends and changes observed. This includes the changing paradigm in high tech organizations as well and was thus very pertinent to the proposed management model.

The management model proposed in this thesis developed a business leadership and management model that can pull the multitude of diverse aspects together that shape and influence the modern high technology company's environment. Such a framework has to rely on guidelines rather than rules, has to consider approaches rather than recipes. Yet some consistent points, or anchors, for the turbulent situation had to be found for the proposed model:

The basic methodology of the management model of this thesis orientates itself on the following **anchors**: Time and space, a system framework, a process and an integrator. The expression anchor was used because some form of reference which provides a degree of stability in the midst of the storm of the daily operations of any business had to be found and articulated.

These model anchors were briefly described as:

Time → The moment of time and its contemporariness, the *Zeitgeist*, the dynamics, kinematics, evolution, discontinuous business cycles, mind-sets, perspectives, values etc

Business Space → a three-dimensional space in which the three spatial axes define the business environment in its entirety

A System Framework → the broad challenges which every business has to address; three of which are strategic, three are operational in nature and one is spanning everything the organisation does

A Process → the four-step process **Imagine-Shape-Deliver-Support**, based on the learning cycle

An Integrator → Integrating all concepts and sub-models on a continuous basis in a framework of effectiveness and sustainability is the essential heart and capstone of the management model. Because of its all-inclusive integrative nature in a completely non-restrictive open system context it represents an extremely powerful methodology which is particularly valid for the fast-paced, turbulent digital age of unpredictability.

The thesis concentrated on some of the so-called softer factors but by no means does it advocate the rescinding or depreciating of analytical functions that always form the basis of good business. Those fundamentals will always represent the backbone of any business, but the critical importance is the way in which those fundamentals are embedded in soft factors such as leadership, culture, trust, enablement, innovation and a host of others.

The thesis objective of formulating a sound management model for the transformation of high technology companies in a sustainable and globally competitive way was achieved through,

- The comprehensiveness of the approach
- The pertinent relevance for high tech organisations
- The multi-disciplinary nature of the approach and hence the effective integration of diverse aspects, soft and hard
- The underlying system-thinking approach
- The continuous re-thinking and re-modeling of the business itself

The management model proposed in the thesis is sufficiently broad and incorporates a multiple of issues in a time- and circumstances-independent manner.

More specifically the proposed management model provides a guideline to a most fundamental aspect of high tech companies:

- How can technically trained managers and leaders effectively build the bridge between rational, analytical, analogue, intuitive issues to enhance the value-generating, globally competitive, human dignity-endorsing aspects of high tech organisations in a consistent and sustainable manner? In other words, how to achieve effective and repeated transformation considering hard and soft issues equivalently.

The management model provides a useful guideline to achieve the outcome alluded to in the thesis title, in the metaphorical sense of *“providing the best shaped surfboard for the most competitive ride on the unpredictable waves of the ocean of business opportunities”*.

6.2 RECOMMENDATIONS

The practical implementation of the management model is a matter of conviction, it is a matter of choice, it is a matter of the will and it is very much a matter of style and substance of the leadership in the high technology company. A recommendation would be to encourage leadership to understand the philosophy and paradigm underlying this model and to implement it daily and boldly.

The proposed management model has to be accepted intellectually as well as intuitively and subsequently it must be implemented with much courage, flexibility and wisdom. As such it cannot be taught, it can only be inspired.

Concerning the quantification of much of what has been elucidated in the thesis, this is a much deeper and possibly complex undertaking as seen by the response to the survey of Chapter 5.

Although the survey undertaken in this thesis was not meant to be exhaustive, rigorous or even conclusive, it does however confirm that in contemporary management of high tech companies with an articulated strategy and vision, awareness and intuitive parameters play as much a role as functional, rational factors. This is recognized by a significant number of the respondents to the survey and supports the approach taken by the author in the articulation of the proposed holistic management model for the transformation of high technology engineering companies for sustained value creation and global competitiveness. In a qualitative manner and in practical day to day operations, the validity of the management model has indeed been shown. A quantitative starting point has even been set with some limited analysis of the survey data.

It is conceivable, that the proposed management model could be quantified further by means of a more rigorous statistical approach with an extended survey, similar but much more extensive than the one attempted in this thesis. Such an extension could focus on each of the seven core challenges and the individual business parameters of Figure 6 and 7. Such an approach could possibly further quantify the validity of the proposed management model.

Hence a recommendation out of this thesis is to formulate a more comprehensive survey with a resultant statistical analysis where further specific parameters as well as criteria for evaluation are again rigorously defined and statistically processed.

The different aspects that are covered in this thesis are of wide scope, the dynamics relatively case-dependent and the real situation so multi-disciplinary in nature, that the subject matter had to be broken up into components for articulation and understanding. There is a practical limit as to how much can be put on paper to advance the mind-set behind the management model, but the proposed management model is appropriate in the hands (minds) of leaders who grasp the philosophical angle of this methodology. With the intuitive hurdle taken and the pre-conditions mentioned above in place, it will still require a wise, insightful, bold yet humble person to implement the model day after day anew and afresh.

It is my hope that at least the elusive essence of the proposed management model has emerged from these pages and the inspiration leads some to boldly implement.



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APPENDIX A: SURVEY COVER LETTER AND QUESTIONNAIRE – ENGLISH & GERMAN

Greetings from Cape Town,

As part of a post-doctoral program that I have undertaken at a South African University (RAU-Johannesburg), with the thesis subject:

“Transformation of High Tech Engineering Companies for sustained Value Creation”,

I would like to request about 10 – 15 minutes of your precious time to obtain answers to some questions related to *business strategy, business transformation and business leadership* which forms part of the research task. There is nothing to sell or to buy. No spamming attempt either. If you read this letter and you are interested in the questions, I would appreciate your response.

My questions are relatively straight forward (although the topic may be complex) and your responses will be kept completely confidential & anonymous. I will process the resulting data statistically (your answers to my questions) and as a small benefit to you, I will share the summarised results with those who participated in this poll.

The whole objective of my thesis is to try and formulate an approach to effective business leadership in its broadest sense so that the company can be globally competitive whilst satisfying most of the needs of its key stakeholders, and still maintain a corporate environment where people find sense and meaning for themselves! You would agree that „keeping it all together“ with excellence and executing it profitably and sustainably is a most formidable task in today’s turbulent, unpredictable, digital, nano-second world.

Trained as an aeronautical engineer, who eventually practiced leadership and management for many years in senior management positions in a large corporate environment, I believe I know and understand the complexity, the diverse demands and the time pressure people like you experience every day. This is confirmed to me daily in my role as an international speaker, consultant and workshop facilitator over the past 12 years in the above key areas.

Should you indulge me and set the time aside to answer the attached questionnaire and simply e-mail the document back to me, I would highly appreciate it. If you wish to check out my *bona fides*, or obtain some more information about me personally and my consulting company Cubex, please feel free to click on www.winzker.com and www.cubex.co.za.

Thank you once again and greetings from a beautiful Cape of Good Hope!

Kind regards,

Dr Dietmar H Winzker
dietmar@winzker.com

Questionnaire (please reply to dietmar@winzker.com)
Simply type your ratings by number into the far right hand column

strongly agree

5

4

3

strongly disagree

2

1

|.....|.....|.....|.....|



Please supply name of Company, your name and e-mail in this space, if you want to receive feed-back	Use this column for any comments you wish to add	Your rating
1. My organisation is well aware of global trends in our and related industries.		
2. My organisation re-positions itself frequently in line with those perceived trends.		
3. A changing external environment results in significant changes in attitude and mind-set in management and in our staff.		
4. In our organisation, we have an effective change-management process in place to facilitate transformation.		
5. Most people in the company clearly understand the long term vision for the company.		
6. People are excited by the vision for the company's future.		
7. Change is handled proactively by our leadership and experienced positively by most of our personnel.		
8. To position our company correctly for the Future, we promote trust, professionalism, excellence, personal integrity and being fair & supportive of people.		
9. Innovation and creativity is often based on "intuition".		
10. The knowledge base of our organisation lies mainly in the heads of our employees.		
11. Personnel is selected not only for expertise and knowledge, but also for special talents and creativity.		
12. Your direct superior acts as a coach and mentor to you.		
13. You act as coach and mentor to your subordinates		
14. You get time and opportunity at work to think and reflect about doing your job more effectively. (compared to perpetual crisis management)		
15. Introducing a truly innovative idea in the work environment is actively supported and promoted by management.		
16. Personnel receives tangible recognition for introducing		

new ideas.		
17. Our company puts more emphasis on doing things right than on doing the right things.		
18. I would like more opportunity for personal development so that I can execute my job more effectively.		
19. Value-based management in all its facets is actively pursued in our company.		
20. The company is achieving an economically sensible Return on Investment.		
21. The individual can relate their activities with the overall financial goals of the company.		
22. Marketing our products and services is the role of the Marketing & Sales people only.		
23. A pro-active customer orientation is reflected in all parts of the organisation by most personnel.		
24. Technical work achieves equal recognition with management work in our company.		
25. My own value to the company is enhanced regularly through opportunities of formal & informal development.		
26. The financial bottom-line is the only bottom-line that counts in our organisation.		
27. Most people actively identify with the common vision for the organisation as expressed by top-management.		
28. My contribution in my present position gives my life sense & meaning: My efforts “make a difference”.		
29. Two-way communication is open, honest and frequent.		
30. People are encouraged to “experiment” to increase the value for all the company’s stakeholders.		

Any other comments you may wish to add:

Grüße aus Kapstadt,

Als Teil eines Doktorantenprogramms an der RAU-Johannesburg (Südafrika) mit dem folgenden Thema:

“Transformation of High Tech Engineering Companies for sustained Value Creation”,

möchte ich 10-15 Minuten Ihrer wertvollen Zeit in Anspruch nehmen, um Ihnen Fragen zum Thema *“business strategy”, “business transformation” and “business leadership”* zu stellen. Sie müssen nichts kaufen oder Verträge eingehen.

Die Fragen sind sehr offen und unkompliziert gestellt (obwohl dies ein sehr komplexes Thema ist). Ihre Antwort wird vertraulich und anonym behandelt. Ich werde die eingehenden Antworten statistisch auswerten und als kleinen Vorteil für Sie, Ihnen die Ergebnisse mitteilen.

Das Ziel des Fragebogens ist es, einen Weg zur effektiven und wertsteigernden Geschäftsführung zu finden, bei der die Firma international wettbewerbsfähig bleibt, die Wünsche der Stakeholder erfüllt werden und trotzdem ein Geschäftsumfeld besteht, in dem Mitarbeiter Sinn und Bedeutung finden und als Individuen wichtig sind.

Sie werden sicher damit übereinstimmen, dass „keeping it all together“ gewinnbringend und stärkend zu erfüllen, eine der schwierigsten Aufgaben in der heutigen turbulenten, unvorhersehbaren, digitalen Welt ist.

Als ausgebildeter „Aeronautical Engineer“, war ich viele Jahre in Führungs- und Managementpositionen in Großunternehmen tätig. Ich denke, dass ich die Komplexität, die unterschiedlichen Ansprüche und den Zeitdruck, den Leute wie Sie täglich haben, kenne und verstehe. Dies wurde mir, in meiner Rolle als internationaler Sprecher, Berater und Seminarleiter in den oben genannten Schwerpunktbereichen in den letzten 12 Jahren immer wieder bestätigt.

Ich würde es sehr zu schätzen wissen, wenn sie sich die Zeit nehmen um dem Fragebogen zu beantworten. Sie können das Dokument einfach als E-Mail an mich zurücksenden.

Wenn Sie mehr über mich und meine Beratungsfirma Cubex (Pty.) Ltd. erfahren wollen, finden sie Informationen unter www.cubex.co.za und www.winzker.com.

Vielen Dank !

Mit freundlichen Grüßen vom schönen Kap der Guten Hoffnung,

Dr Dietmar H Winzker
dietmar@winzker.com

Fragebogen

Stimme vollkommen zu

Stimme überhaupt nicht zu



Falls Sie Feedback bekommen möchten, tragen Sie hier bitte den Namen Ihrer Firma, Ihren Namen und Ihre E-Mail Adresse ein	In dieser Spalte können Sie Kommentare einfügen	Ihr Rating
1. Unser Unternehmen ist sich der globalen Trends in unserer und verwandter Industrien bewußt.		
2. Unser Unternehmen repositioniert sich regelmäßig mit Blick auf die aktuellen Trends.		
3. Ein sich änderndes äußeres Umfeld führt zu erheblichen Änderung der Haltung und Denkweise des Managements und der Mitarbeiter unseres Unternehmens.		
4. In unserer Organisation haben wir einen effektiven change-management Prozess um die Transformation zu erleichtern.		
5. Die meisten Mitarbeiter unseres Unternehmens verstehen die langfristige Vision für unser Unternehmen klar und deutlich.		
6. Mitarbeiter sind begeistert von der Vision für die Zukunft unseres Unternehmens.		
7. Veränderungsvorschläge (Change) werden durch das Management begrüßt und von den meisten Mitarbeitern als positiv empfunden.		
8. Um unser Unternehmen richtig für die Zukunft zu positionieren, werben wir mit Vertrauen, Professionalität, Vorzügen, Personalintegrität und Fairness und Unterstützung der Menschen.		
9. Innovation und Kreativität basieren oft auf "Intuition".		
10. Das Wissen unseres Unternehmens liegt hauptsächlich in den Köpfen unserer Mitarbeiter.		
11. Personal wird nicht nur nach Wissen und Fachkenntnis ausgesucht, sondern auch nach speziellen Talenten und Kreativität.		
12. Ihr Vorgesetzter fungiert als Berater und Mentor für Sie.		
13. Sie fungieren als Berater und Mentor für Ihre Mitarbeiter.		
14. Sie haben auf Arbeit die Zeit und Möglichkeit, darüber nachzudenken, wie man Ihre Arbeit effektiver machen könnte. (Verglichen mit ständigen Krisenmanagement)		
15. Die Einführung von wirklich innovativen Ideen im Arbeitsumfeld wird aktiv vom Management unterstützt.		

16. Mitarbeiter erhalten handfeste Anerkennung für die Einführung neuer Ideen.		
17. Unser Unternehmen setzt mehr daran Dinge richtig zu machen, als die richtigen Dinge zu machen.		
18. Ich hätte gerne mehr Möglichkeiten zur persönlichen Entwicklung, so dass ich meine Arbeit effektiver gestalten kann.		
19. Wertsteigerndes Management wird in unseren Unternehmen mit all seinen Facetten aktiv verfolgt.		
20. Unser Unternehmen erreicht regelmäßig einen positiven Return on Investment.		
21. Der Einzelne kann seine Arbeit mit den grundsätzlichen finanziellen Zielen des Unternehmens verbinden.		
22. Das Marketing unserer Produkte und Services ist alleine die Aufgabe unserer Marketing & Verkaufsabteilung.		
23. Eine pro-aktive Kundenorientierung spiegelt sich in allen Teilen unseres Unternehmens durch die meisten Mitarbeiter wieder.		
24. Technische Arbeit erhält in unserer Firma gleiche Anerkennung wie Manangementarbeit.		
25. Mein eigener Wert für die Firma wird regelmäßig durch Möglichkeiten zur persönlichen Weiterentwicklung gesteigert.		
26. Finanzielle Kennzahlen werden als die einzig wichtigen Kennzahlen im Unternehmen betrachtet.		
27. Die meisten Mitarbeiter können sich aktiv mit der Managementvision für das Unternehmen identifizieren.		
28. Mein Beitrag in meiner derzeitigen Position gibt meinem Leben Sinn und Bedeutung: Meine Bemühungen „machen den Unterschied“		
29. “Two-way” Kommunikation ist offen, ehrlich und regelmäßig.		
30. Mitarbeiter werden zum “Experimentieren” ermutigt, um den Wert für die Stakeholder des Unternehmens durch Innovation zu erhöhen.		

Andere Kommentare die Sie noch hinzufügen möchten:

APPENDIX B: QUESTIONNAIRE RESPONSES

Table 1: Raw response data – Group A Summarised response of 27 Companies out of 328 e-mails sent		RATING FRE- QUENCY				
GROUP A		5	4	3	2	1
1. My organisation is well aware of global trends in our and related industries.		14	5	3	2	3
2. My organisation re-positions itself frequently in line with those perceived trends.		6	8	6	4	3
3. A changing external environment results in significant changes in attitude and mind-set in management and in our staff.		4	5	7	3	
4. In our organisation, we have an effective change-management process in place to facilitate transformation.		3	7	8	5	4
5. Most people in the company clearly understand the long term vision for the company.		11	5	4	3	4
6. People are excited by the vision for the company's future.		5	8	9	4	1
7. Change is handled proactively by our leadership and experienced positively by most of our personnel.		5	8	3	7	4
8. To position our company correctly for the Future, we promote trust, professionalism, excellence, personal integrity and being fair & supportive of people.		3	5	6	6	7
9. Innovation and creativity is often based on "intuition".		2	6	6	7	6
10. The knowledge base of our organisation lies mainly in the heads of our employees.		10	6	5	3	3
11. Personnel is selected not only for expertise and knowledge, but also for special talents and creativity.		6	8	7	5	1
12. Your direct superior acts as a coach and mentor to you.		3	7	5	5	7
13. You act as coach and mentor to your subordinates		9	5	4	3	6
14. You get time and opportunity at work to think and reflect about doing your job more effectively. (compared to perpetual crisis management)		7	7	5	2	6

15. Introducing a truly innovative idea in the work environment is actively supported and promoted by management.	5	8	5	4	5
16. Personnel receives tangible recognition for introducing new ideas.	11	6	7	1	2
17. Our company puts more emphasis on doing things right than on doing the right things.	14	5	0	1	7
18. I would like more opportunity for personal development so that I can execute my job more effectively.	7	3	4	5	8
19. Value-based management in all its facets is actively pursued in our company.	5	10	7	4	1
20. The company is achieving an economically sensible Return on Investment.	11	9	2	3	2
21. The individual can relate their activities with the overall financial goals of the company.	8	5	4	7	3
22. Marketing our products and services is the role of the Marketing & Sales people only.	0	3	8	7	9
23. A pro-active customer orientation is reflected in all parts of the organisation by most personnel.	4	6	7	4	6
24. Technical work achieves equal recognition with management work in our company.	1	4	9	5	8
25. My own value to the company is enhanced regularly through opportunities of formal & informal development.	4	7	3	4	9
26. The financial bottom-line is the only bottom-line that counts in our organisation.	9	4	5	2	7
27. Most people actively identify with the common vision for the organisation as expressed by top-management.	10	6	5	4	2
28. My contribution in my present position gives my life sense & meaning: My efforts "make a difference".	12	7	3	0	5
29. Two-way communication is open, honest and frequent.	8	5	2	6	6
30. People are encouraged to "experiment" to increase the value for all the company's stakeholders.	5	5	1	4	12

Table 2: Raw response data – Group B

Summarised response of 82 individuals out of 135 e-mails sent	RATING				
	FREQUENCY				
	5	4	3	2	1
GROUP B					
1. My organisation is well aware of global trends in our and related industries.	55	14	4	7	2
2. My organisation re-positions itself frequently in line with those perceived trends.	36	19	8	6	13
3. A changing external environment results in significant changes in attitude and mindset in management and in our staff.	22	23	13	9	15
4. In our organisation, we have an effective change-management process in place to facilitate transformation.	20	12	24	16	10
5. Most people in the company clearly understand the long term vision for the company.	21	19	16	8	18
6. People are excited by the vision for the company's future.	19	24	14	17	8
7. Change is handled proactively by our leadership and experienced positively by most of our personnel.	14	18	19	23	8
8. To position our company correctly for the Future, we promote trust, professionalism, excellence, personal integrity and being fair & supportive of people.	23	13	9	19	18
9. Innovation and creativity is often based on "intuition".	9	15	19	18	21
10. The knowledge base of our organisation lies mainly in the heads of our employees.	49	16	8	8	1
11. Personnel is selected not only for expertise and knowledge, but also for special talents and creativity.	16	8	15	19	24
12. Your direct superior acts as a coach and mentor to you.	13	19	26	15	9
13. You act as coach and mentor to your subordinates	37	16	10	8	11
14. You get time and opportunity at work to think and reflect about doing your job more effectively. (compared to perpetual crisis management)	22	20	15	7	18
15. Introducing a truly innovative idea in the work environment is actively supported and promoted by management.	35	26	14	7	0

16. Personnel receives tangible recognition for introducing new ideas.	26	18	16	10	12
17. Our company puts more emphasis on doing things right than on doing the right things.	20	9	8	17	28
18. I would like more opportunity for personal development so that I can execute my job more effectively.	24	17	12	15	14
19. Value-based management in all its facets is actively pursued in our company.	9	16	26	20	11
20. The company is achieving an economically sensible Return on Investment.	45	19	13	3	2
21. The individual can relate their activities with the overall financial goals of the company.	26	23	9	13	11
22. Marketing our products and services is the role of the Marketing & Sales people only.	9	11	22	21	19
23. A pro-active customer orientation is reflected in all parts of the organisation by most personnel.	19	14	17	20	12
24. Technical work achieves equal recognition with management work in our company.	8	18	16	16	24
25. My own value to the company is enhanced regularly through opportunities of formal & informal development.	20	18	16	19	9
26. The financial bottom-line is the only bottom-line that counts in our organisation.	30	17	9	12	14
27. Most people actively identify with the common vision for the organisation as expressed by top-management.	27	16	7	10	22
28. My contribution in my present position gives my life sense & meaning: My efforts "make a difference".	29	14	15	13	11
29. Two-way communication is open, honest and frequent.	30	16	12	9	15
30. People are encouraged to "experiment" to increase the value for all the company's stakeholders.	22	18	17	14	11

Table 3: Questions and Responses ordered according to the seven challenges

	Group A										Group B										
	A5	A4	A3	A2	A1	B5	B4	B3	B2	B1	A5	A4	A3	A2	A1	B5	B4	B3	B2	B1	
3. A changing external environment results in significant changes in attitude and mind-set in management and in our staff.	C	4	0.15	5	0.19	7	0.26	3	0.11	8	0.3	22	0.27	23	0.28	13	0.16	9	0.11	15	0.18
4. In our organisation, we have an effective change-management process in place to facilitate transformation.	C	3	0.11	7	0.26	8	0.3	5	0.19	4	0.15	20	0.24	12	0.15	24	0.29	16	0.2	10	0.12
7. Change is handled proactively by our leadership and experienced positively by most of our personnel.	C	5	0.19	8	0.3	3	0.11	7	0.26	4	0.15	14	0.17	18	0.22	19	0.23	23	0.28	8	0.1
1. My organisation is well aware of global trends in our and related industries.	F	14	0.52	5	0.19	3	0.11	2	0.07	3	0.11	55	0.67	14	0.17	4	0.05	7	0.09	2	0.02
2. My organisation re-positions itself frequently in line with those perceived trends.	F	6	0.22	8	0.3	6	0.22	4	0.15	3	0.11	36	0.44	19	0.23	8	0.1	6	0.07	13	0.16
5. Most people in the company clearly understand the long term vision for the company.	F	11	0.41	5	0.19	4	0.15	3	0.11	4	0.15	21	0.26	19	0.23	16	0.2	8	0.1	18	0.22
6. People are excited by the vision for the company's future.	F	5	0.19	8	0.3	9	0.33	4	0.15	1	0.04	19	0.23	24	0.29	14	0.17	17	0.21	8	0.1
8. To position our company correctly for the Future, we promote trust, professionalism, excellence, personal integrity and being fair & supportive of people.	F	3	0.11	5	0.19	6	0.22	6	0.22	7	0.26	23	0.28	13	0.16	9	0.11	19	0.23	18	0.22
9. Innovation and creativity is often based on "intuition".	I	2	0.07	6	0.22	6	0.22	7	0.26	6	0.22	9	0.11	15	0.18	19	0.23	18	0.22	21	0.26
16. Personnel receives tangible recognition for introducing new ideas.	I	11	0.41	6	0.22	7	0.26	1	0.04	2	0.07	26	0.32	18	0.22	16	0.2	10	0.12	12	0.15
15. Introducing a truly innovative idea in the work environment is actively supported and promoted by management.	I	5	0.19	8	0.3	5	0.19	4	0.15	5	0.19	35	0.43	26	0.32	14	0.17	7	0.09	0	0
10. The knowledge base of our organisation lies mainly in the heads of our employees.	K	10	0.37	6	0.22	5	0.19	3	0.11	3	0.11	49	0.6	16	0.2	8	0.1	8	0.1	1	0.01
22. Marketing our products and services is the role of the Marketing & Sales people only.	K	0	0	3	0.11	8	0.3	7	0.26	9	0.33	9	0.11	11	0.13	22	0.27	21	0.26	19	0.23
23. A pro-active customer orientation is reflected in all parts of the organisation by most personnel.	K	4	0.15	6	0.22	7	0.26	4	0.15	6	0.22	19	0.23	14	0.17	17	0.21	20	0.24	12	0.15
29. Two-way communication is open, honest and frequent.	K	8	0.3	5	0.19	2	0.07	6	0.22	6	0.22	30	0.37	16	0.2	12	0.15	9	0.11	15	0.18

30. People are encouraged to “experiment” to increase the value for all the company’s stakeholders.	K	5	0.19	5	0.19	1	0.04	4	0.15	12	0.44	22	0.27	18	0.22	17	0.21	14	0.17	11	0.13
14. You get time and opportunity at work to think and reflect about doing your job more effectively. (compared to perpetual crisis management)	K	7	0.26	7	0.26	5	0.19	2	0.07	6	0.22	22	0.27	20	0.24	15	0.18	7	0.09	18	0.22
12. Your direct superior acts as a coach and mentor to you.	L	3	0.11	7	0.26	5	0.19	5	0.19	7	0.26	13	0.16	19	0.23	26	0.32	15	0.18	9	0.11
13. You act as coach and mentor to your subordinates	L	9	0.33	5	0.19	4	0.15	3	0.11	6	0.22	37	0.45	16	0.2	10	0.12	8	0.1	11	0.13
17. Our company puts more emphasis on doing things right than on doing the right things.	L	14	0.52	5	0.19	0	0	1	0.04	7	0.26	20	0.24	9	0.11	8	0.1	17	0.21	28	0.34
24. Technical work achieves equal recognition with management work in our company.	L	1	0.04	4	0.15	9	0.33	5	0.19	8	0.3	8	0.1	18	0.22	16	0.2	16	0.2	24	0.29
25. My own value to the company is enhanced regularly through opportunities of formal & informal development.	L	4	0.15	7	0.26	3	0.11	4	0.15	9	0.33	20	0.24	18	0.22	16	0.2	19	0.23	9	0.11
27. Most people actively identify with the common vision for the organisation as expressed by top-management.	L	10	0.37	6	0.22	5	0.19	4	0.15	2	0.07	27	0.33	16	0.2	7	0.09	10	0.12	22	0.27
11. Personnel is selected not only for expertise and knowledge, but also for special talents and creativity.	P	6	0.22	8	0.3	7	0.26	5	0.19	1	0.04	16	0.2	8	0.1	15	0.18	19	0.23	24	0.29
18. I would like more opportunity for personal development so that I can execute my job more effectively.	P	7	0.26	3	0.11	4	0.15	5	0.19	8	0.3	24	0.29	17	0.21	12	0.15	15	0.18	14	0.17
28. My contribution in my present position gives my life sense & meaning: My efforts “make a difference”.	P	12	0.44	7	0.26	3	0.11	0	0	5	0.19	29	0.35	14	0.17	15	0.18	13	0.16	11	0.13
19. Value-based management in all its facets is actively pursued in our company.	V	5	0.19	10	0.37	7	0.26	4	0.15	1	0.04	9	0.11	16	0.2	26	0.32	20	0.24	11	0.13
20. The company is achieving an economically sensible Return on Investment.	V	11	0.41	9	0.33	2	0.07	3	0.11	2	0.07	45	0.55	19	0.23	13	0.16	3	0.04	2	0.02
21. The individual can relate their activities with the overall financial goals of the company.	V	8	0.3	5	0.19	4	0.15	7	0.26	3	0.11	26	0.32	23	0.28	9	0.11	13	0.16	11	0.13
26. The financial bottom-line is the only bottom-line that counts in our organisation.	V	9	0.33	4	0.15	5	0.19	2	0.07	7	0.26	30	0.37	17	0.21	9	0.11	12	0.15	14	0.17

APPENDIX C: PROCESSED SURVEY RESULTS

Table 4

Comparison: Leadership Challenge - Group A (LA), Group B (LB)

Comparison:

Leadership Challenge

- Group A (LA),

Group B (LB)

LA	0.1111111	0.2592593	0.1851852	0.1851852	0.2592593
LA	0.3333333	0.1851852	0.1481481	0.1111111	0.2222222
LA	0.5185185	0.1851852	0	0.037037	0.2592593
LA	0.037037	0.1481481	0.3333333	0.1851852	0.2962963
LA	0.1481481	0.2592593	0.1111111	0.1481481	0.3333333
LA	0.3703704	0.2222222	0.1851852	0.1481481	0.0740741
Leadership A	1.5185185	1.2592593	0.962963	0.8148148	1.4444444
LB	0.1585366	0.2317073	0.3170732	0.1829268	0.1097561
LB	0.4512195	0.195122	0.1219512	0.097561	0.1341463
LB	0.2439024	0.1097561	0.097561	0.2073171	0.3414634
LB	0.097561	0.2195122	0.195122	0.195122	0.2926829
LB	0.2439024	0.2195122	0.195122	0.2317073	0.1097561
LB	0.3292683	0.195122	0.0853659	0.1219512	0.2682927
Leadership B	1.5243902	1.1707317	1.0121951	1.0365854	1.2560976
	strongly agree	agree	okay	disagree	strongly disagree
Group A	0.2530864	0.2098765	0.1604938	0.1358025	0.2407407
Group B	0.254065	0.195122	0.1686992	0.1727642	0.2093496

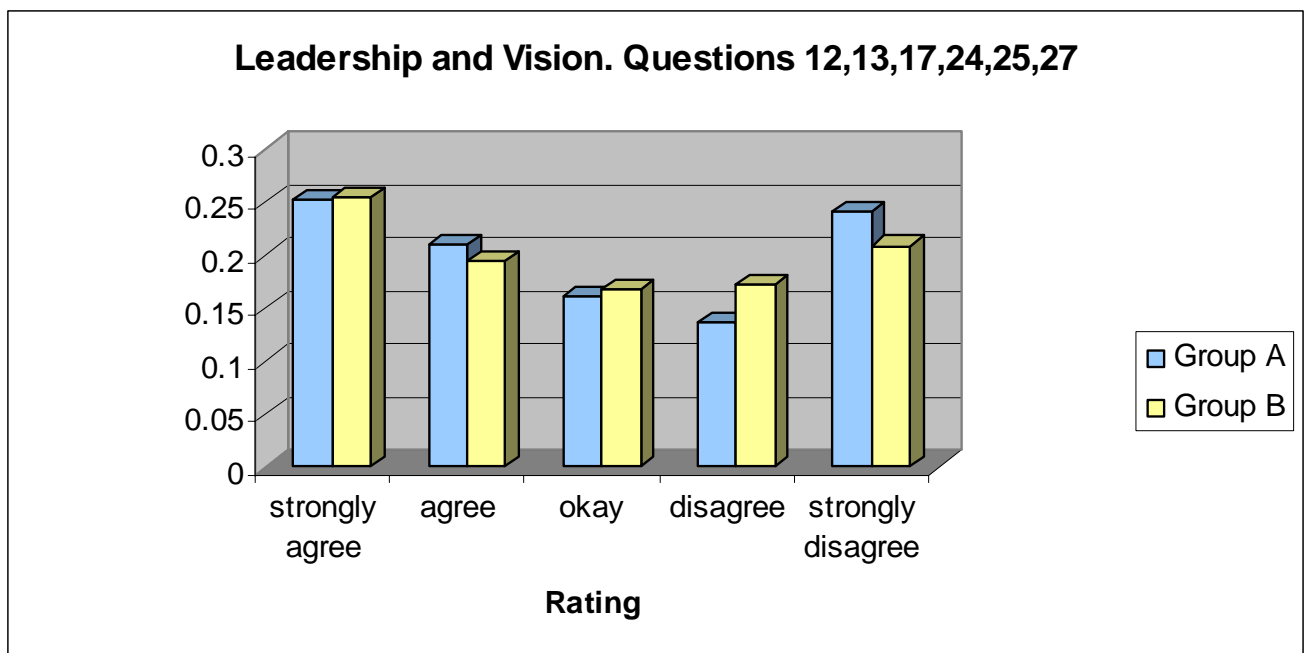


Table 5:

Comparison: Future Challenge - Group A (FA), Group B (FB)

FA	0.5185185	0.1851852	0.1111111	0.0740741	0.1111111
FA	0.2222222	0.2962963	0.2222222	0.1481481	0.1111111
FA	0.4074074	0.1851852	0.1481481	0.1111111	0.1481481
FA	0.1851852	0.2962963	0.3333333	0.1481481	0.037037
FA	0.1111111	0.1851852	0.2222222	0.2222222	0.2592593
Future A	1.4444444	1.1481481	1.037037	0.7037037	0.6666667
FB	0.6707317	0.1707317	0.0487805	0.0853659	0.0243902
FB	0.4390244	0.2317073	0.097561	0.0731707	0.1585366
FB	0.2560976	0.2317073	0.195122	0.097561	0.2195122
FB	0.2317073	0.2926829	0.1707317	0.2073171	0.097561
FB	0.2804878	0.1585366	0.1097561	0.2317073	0.2195122
Future B	1.8780488	1.0853659	0.6219512	0.695122	0.7195122
	strongly agree	agree	okay	disagree	strongly disagree
Future A	2.1585366	1.2439024	0.7317073	0.9268293	0.9390244
Future B	4.0365854	2.3292683	1.3536585	1.6219512	1.6585366
	strongly agree	agree	okay	disagree	strongly disagree
Group A	0.2888889	0.2296296	0.2074074	0.1407407	0.1333333
Group B	0.3756098	0.2170732	0.1243902	0.1390244	0.1439024

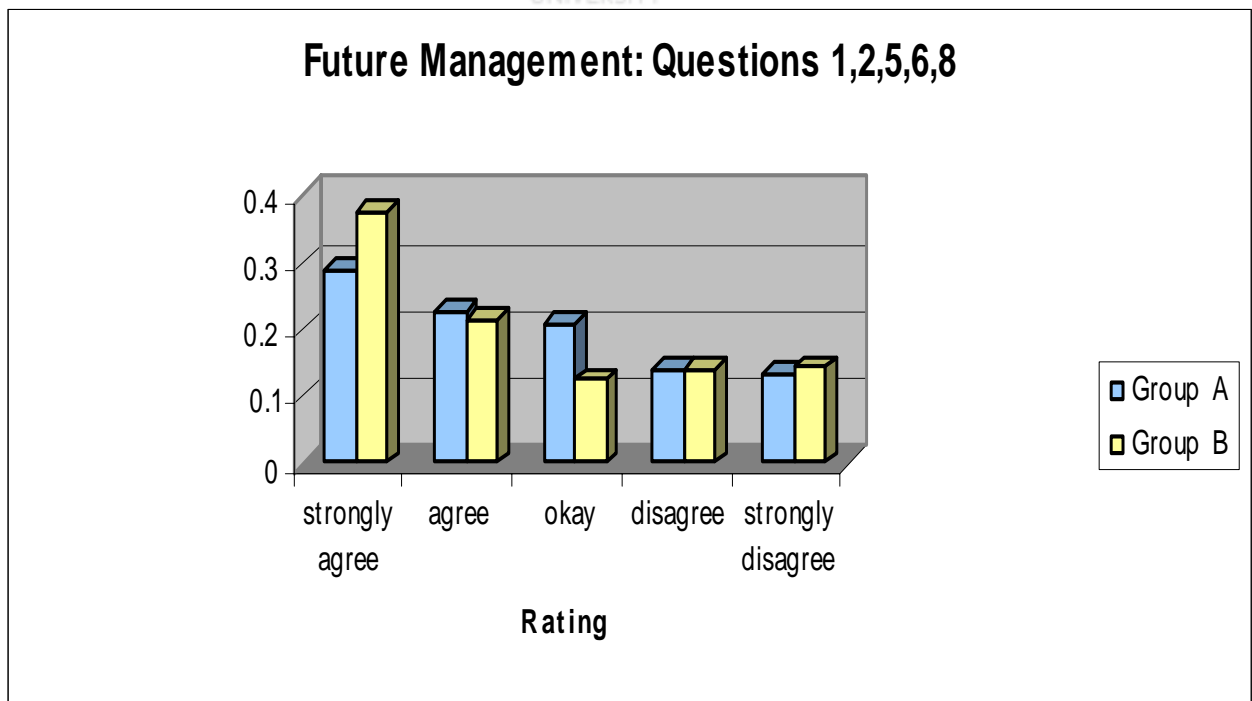


Table 6:

Comparison: Change Challenge - Group A (CA), Group B (CB)

CA	0.148148148	0.185185185	0.259259259	0.111111111	0.296296296
CA	0.111111111	0.259259259	0.296296296	0.185185185	0.148148148
CA	0.185185185	0.296296296	0.111111111	0.259259259	0.148148148
Sum Group A	0.444444444	0.740740741	0.666666667	0.555555556	0.592592593
CB	0.268292683	0.280487805	0.158536585	0.109756098	0.182926829
CB	0.243902439	0.146341463	0.292682927	0.195121951	0.12195122
CB	0.170731707	0.219512195	0.231707317	0.280487805	0.097560976
Sum Group B	0.682926829	0.646341463	0.682926829	0.585365854	0.402439024
	strongly agree	agree	okay	disagree	strongly disagree
Group A	0.148	0.246	0.222	0.185	0.197
Group B	0.227	0.215	0.227	0.195	0.134

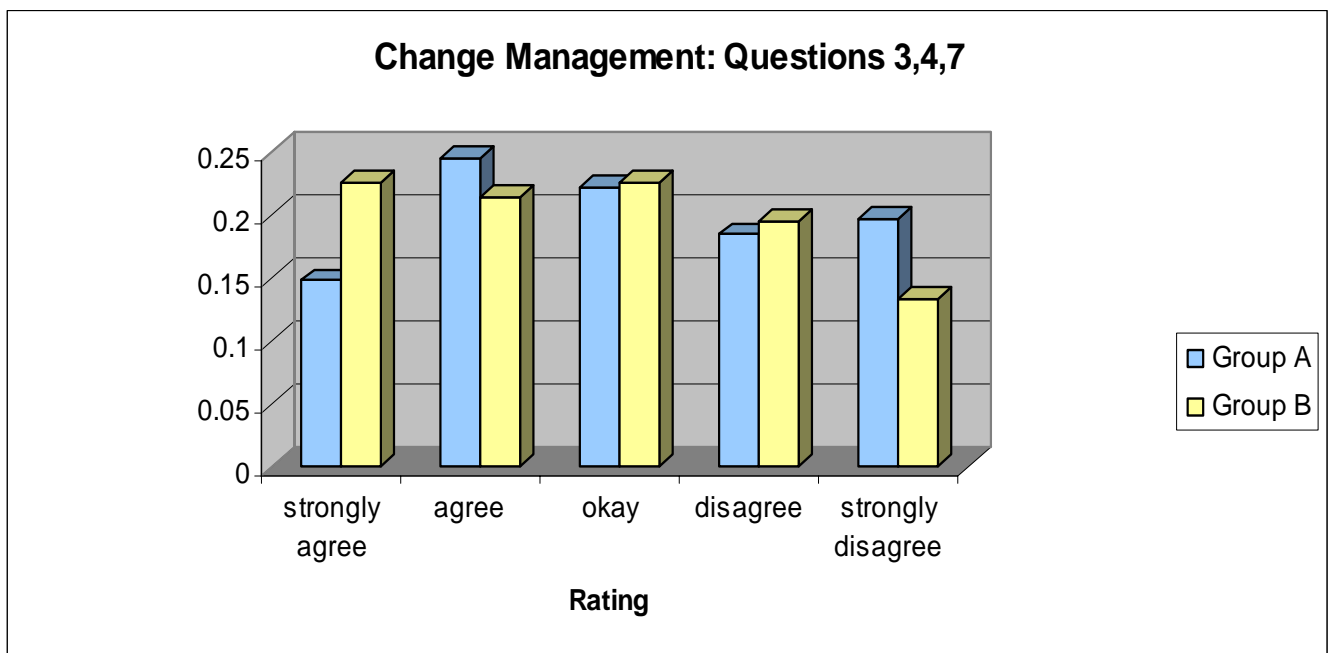


Table 7:

Comparison: Knowledge Challenge - Group A (KA), Group B (KB)

KA	0.3703704	0.2222222	0.1851852	0.1111111	0.1111111
KA	0	0.1111111	0.2962963	0.2592593	0.3333333
KA	0.1481481	0.2222222	0.2592593	0.1481481	0.2222222
KA	0.2962963	0.1851852	0.0740741	0.2222222	0.2222222
KA	0.1851852	0.1851852	0.037037	0.1481481	0.4444444
KA	0.2592593	0.2592593	0.1851852	0.0740741	0.2222222
Knowledge A	1.2592593	1.1851852	1.037037	0.962963	1.5555556
KB	0.597561	0.195122	0.097561	0.097561	0.0121951
KB	0.1097561	0.1341463	0.2682927	0.2560976	0.2317073
KB	0.2317073	0.1707317	0.2073171	0.2439024	0.1463415
KB	0.3658537	0.195122	0.1463415	0.1097561	0.1829268
KB	0.2682927	0.2195122	0.2073171	0.1707317	0.1341463
KB	0.2682927	0.2439024	0.1829268	0.0853659	0.2195122
Knowledge B	1.8414634	1.1585366	1.1097561	0.9634146	0.9268293
	strongly agree	agree	okay	disagree	strongly disagree
Group A	0.2098765	0.1975309	0.1728395	0.1604938	0.2592593
Group B	0.3069106	0.1930894	0.1849593	0.1605691	0.1544715

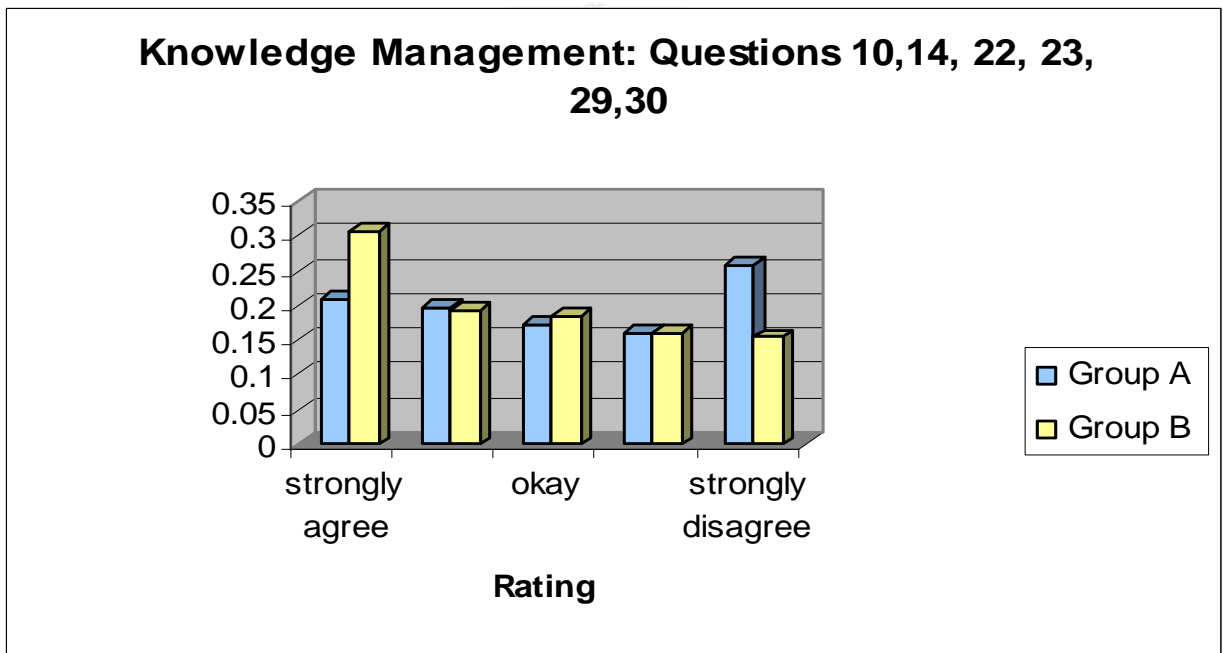


Table 8:

Comparison: Innovation Challenge - Group A (IA), Group B (IB)

IA	0.07407407	0.2222222	0.2222222	0.2592593	0.2222222
IA	0.40740741	0.2222222	0.2592593	0.037037	0.0740741
IA	0.18518519	0.2962963	0.1851852	0.1481481	0.1851852
Innovation A	0.66666667	0.7407407	0.6666667	0.4444444	0.4814815
IB	0.1097561	0.1829268	0.2317073	0.2195122	0.2560976
IB	0.31707317	0.2195122	0.195122	0.1219512	0.1463415
IB	0.42682927	0.3170732	0.1707317	0.0853659	0
Innovation B	0.85365854	0.7195122	0.597561	0.4268293	0.402439
	strongly agree	agree	okay	disagree	strongly disagree
Group A	0.22222222	0.2469136	0.2222222	0.1481481	0.1604938
Group B	0.28455285	0.2398374	0.199187	0.1422764	0.1341463

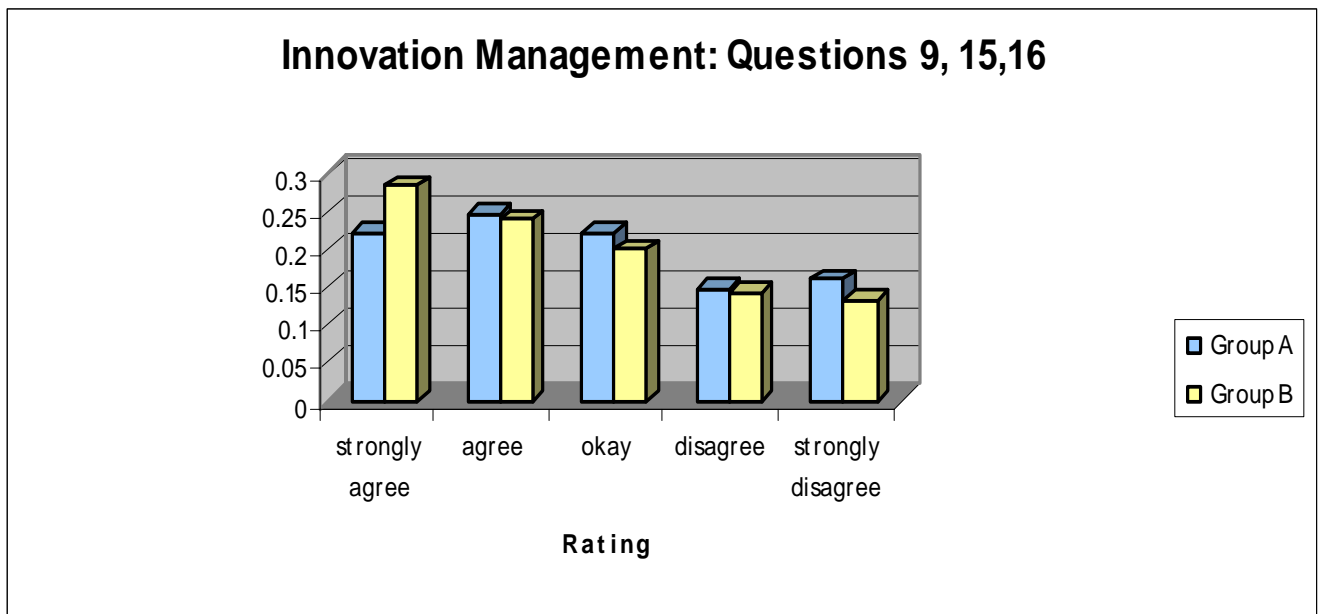


Table 9:

Comparison: Personal Mastery Challenge - Group A (PA), Group B (PB)

PA	0.2222222	0.2962963	0.2592593	0.1851852	0.037037
PA	0.2592593	0.1111111	0.1481481	0.1851852	0.2962963
PA	0.4444444	0.2592593	0.1111111	0	0.1851852
Personal A	0.9259259	0.6666667	0.5185185	0.3703704	0.5185185
PB	0.195122	0.097561	0.1829268	0.2317073	0.2926829
PB	0.2926829	0.2073171	0.1463415	0.1829268	0.1707317
PB	0.3536585	0.1707317	0.1829268	0.1585366	0.1341463
Personal B	0.8414634	0.4756098	0.5121951	0.5731707	0.597561

	strongly agree	agree	okay	disagree	strongly disagree
Group A	0.308642	0.2222222	0.1728395	0.1234568	0.1728395
Group B	0.2804878	0.1585366	0.1707317	0.1910569	0.199187

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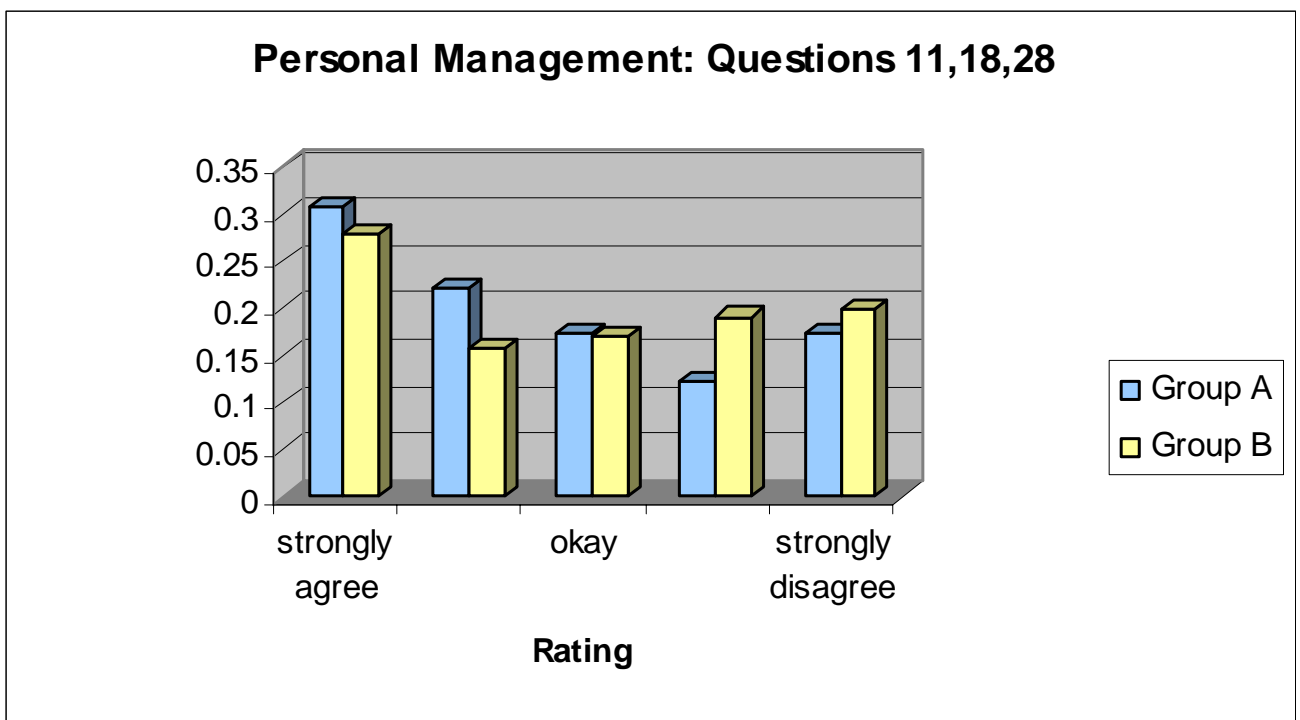


Table 10:

Comparison: Value Challenge - Group A (VA), Group B (VB)

VA	0.1851852	0.3703704	0.2592593	0.1481481	0.037037
VA	0.4074074	0.3333333	0.0740741	0.1111111	0.0740741
VA	0.2962963	0.1851852	0.1481481	0.2592593	0.1111111
VA	0.3333333	0.1481481	0.1851852	0.0740741	0.2592593
Value A	1.2222222	1.037037	0.6666667	0.5925926	0.4814815
VB	0.1097561	0.195122	0.3170732	0.2439024	0.1341463
VB	0.5487805	0.2317073	0.1585366	0.0365854	0.0243902
VB	0.3170732	0.2804878	0.1097561	0.1585366	0.1341463
VB	0.3658537	0.2073171	0.1097561	0.1463415	0.1707317
Value B	1.3414634	0.9146341	0.695122	0.5853659	0.4634146

	strongly agree	agree	okay	disagree	strongly disagree
Group A	0.3055556	0.2592593	0.1666667	0.1481481	0.1203704
Group B	0.3353659	0.2286585	0.1737805	0.1463415	0.1158537

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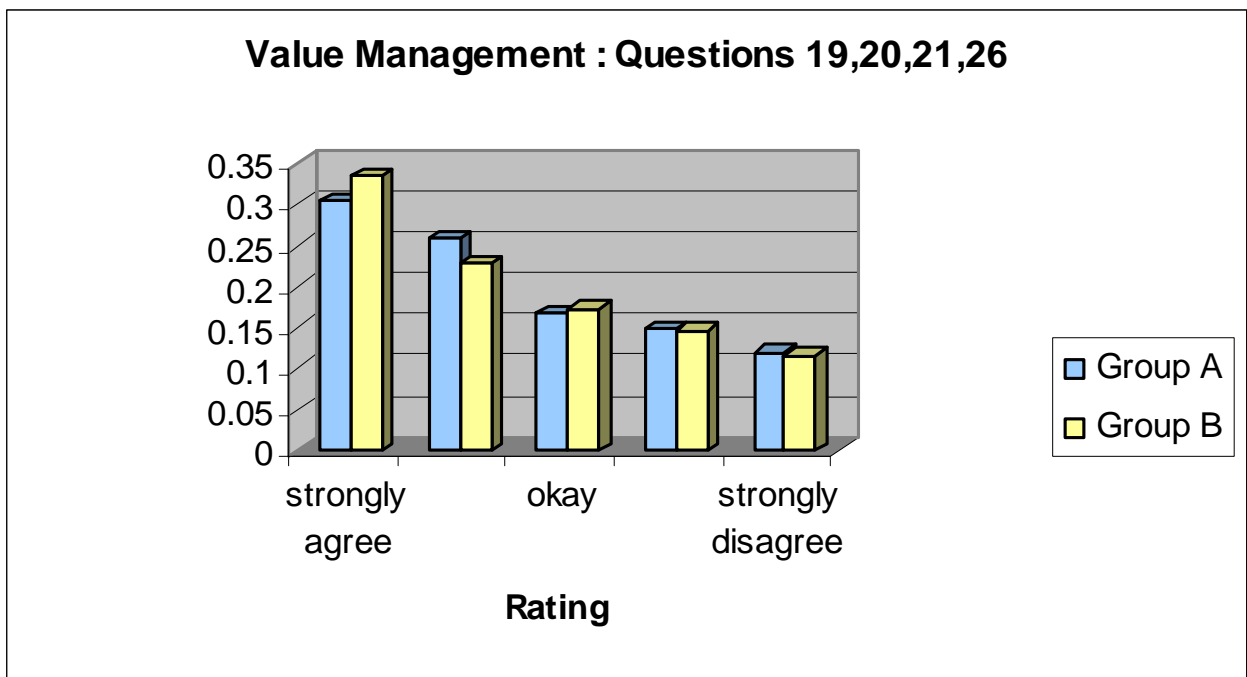
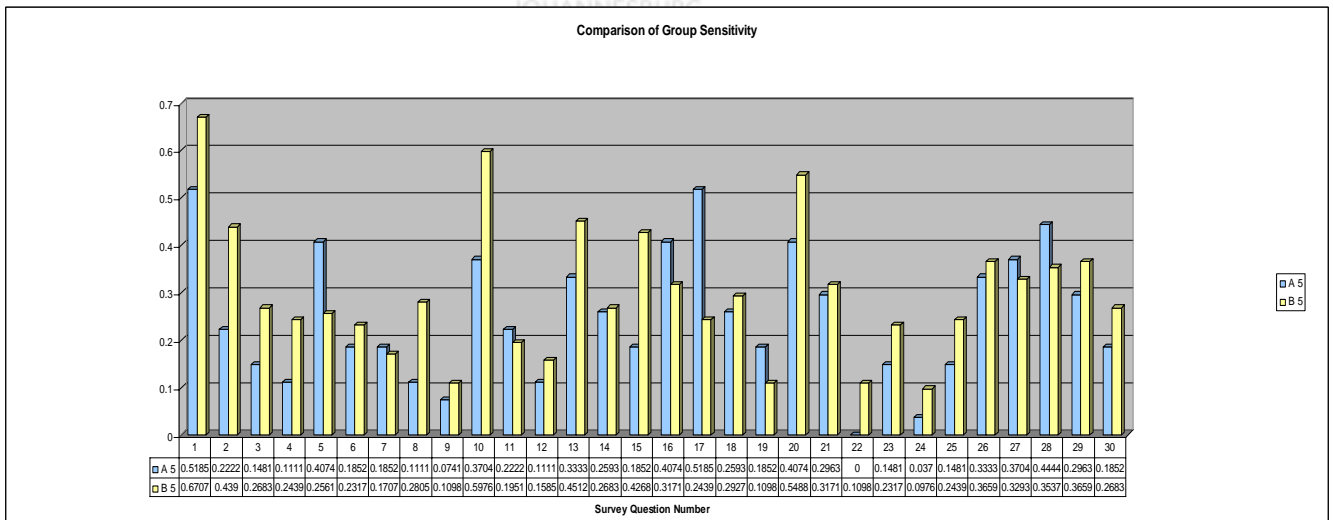
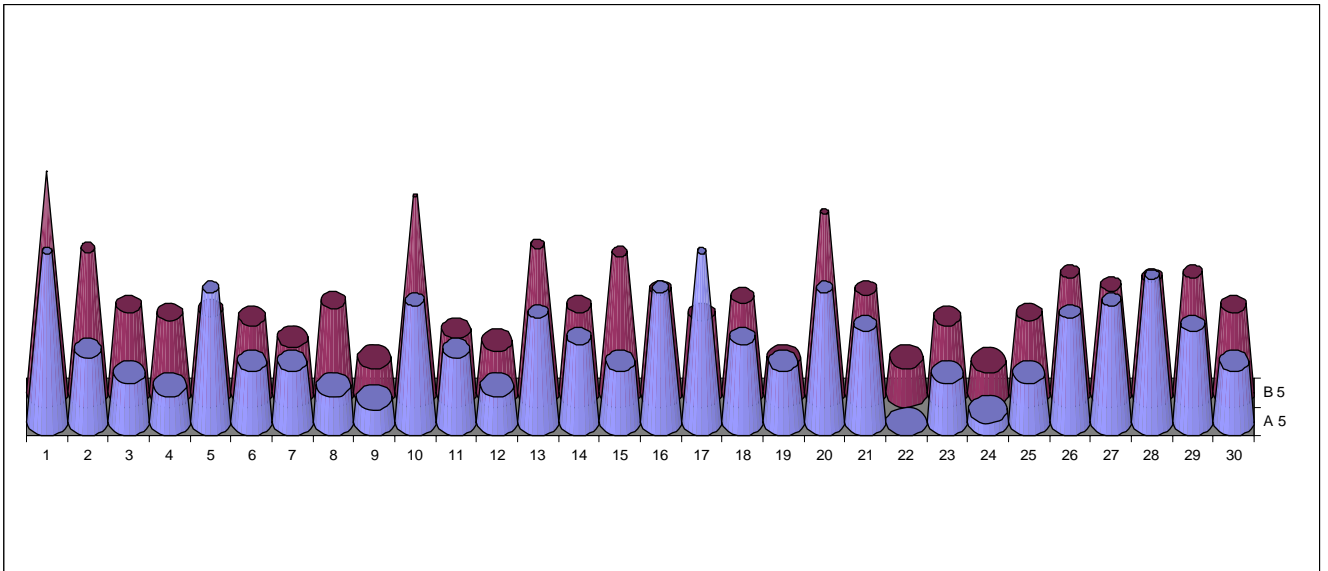


TABLE 11:
GROUP SENSITIVITY:
Group A (“Strangers”), Group B (Workshop Participants)



APPENDIX D : FIGURES

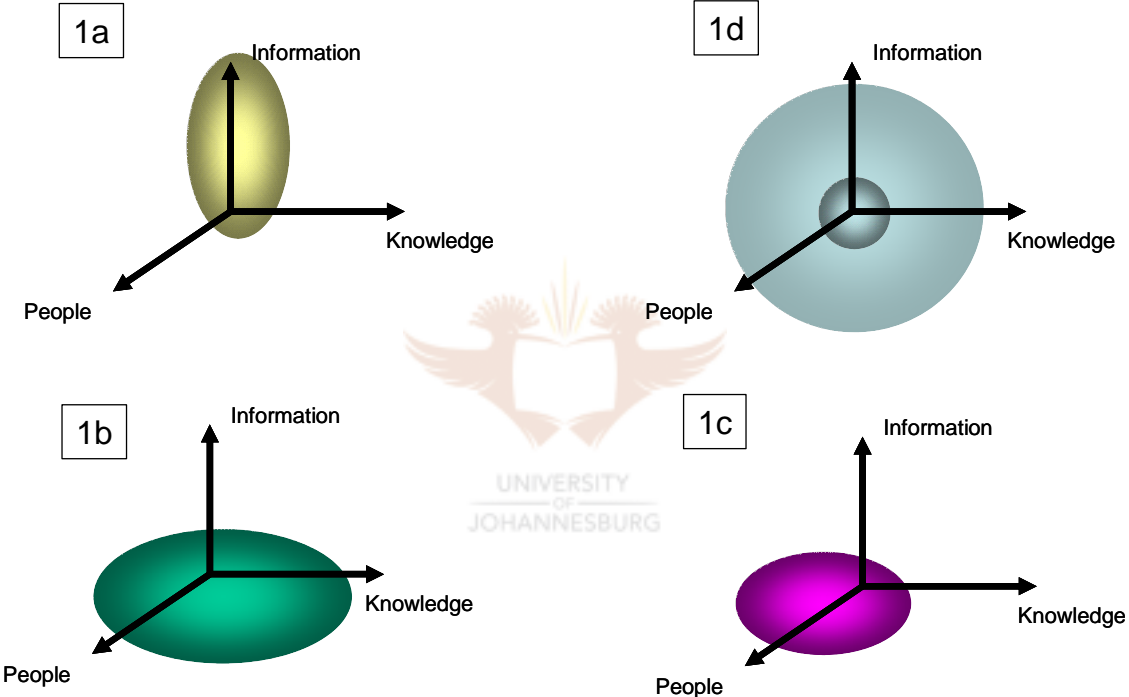


Figure 1: Business Space Dimensions

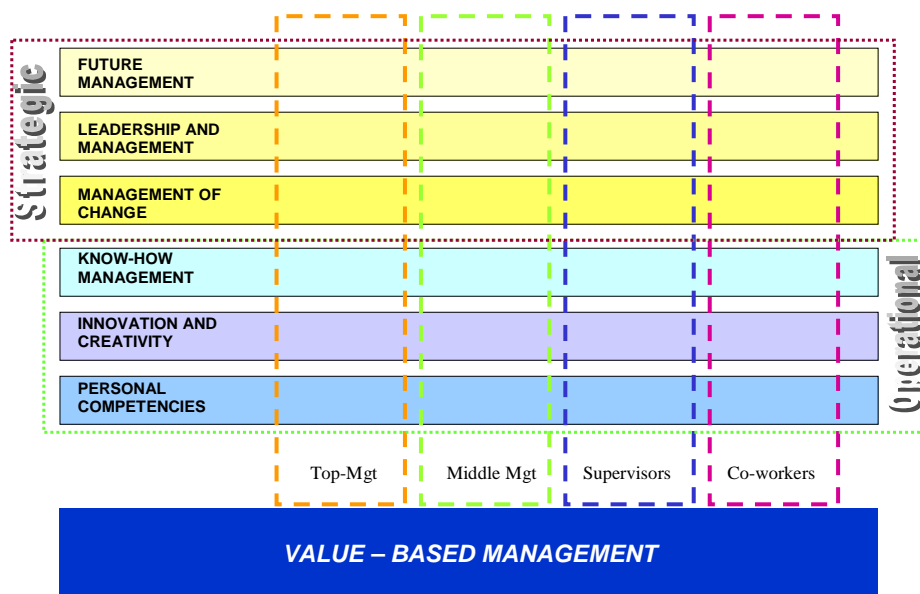


Figure 2: Seven Challenges

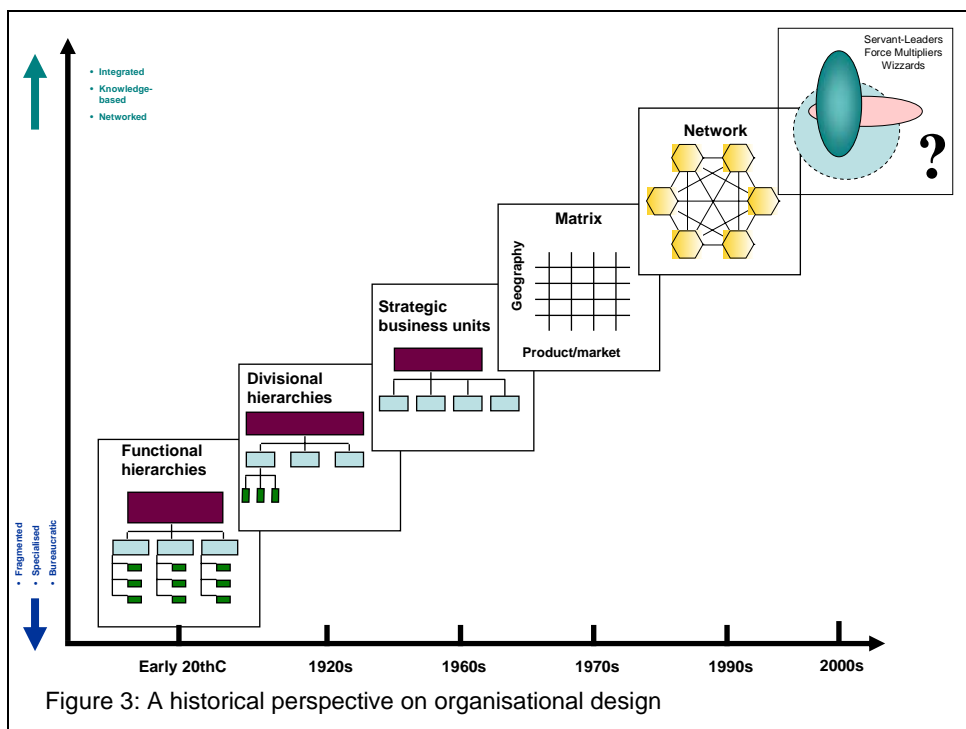


Figure 3: A historical perspective on organisational design

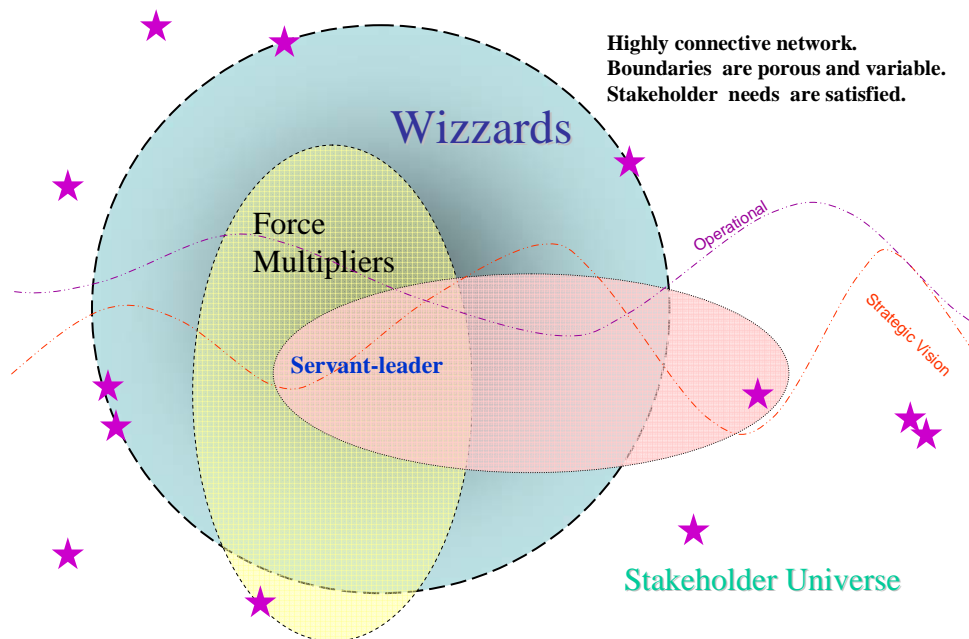


Figure 4: Roles in the Stakeholder Universe

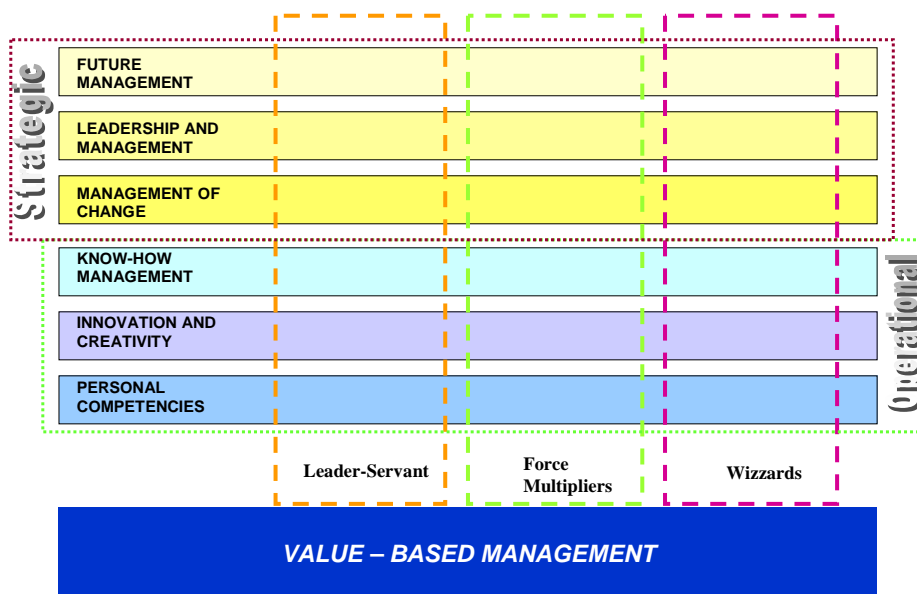


Figure 5: Seven Challenges with roles rather than functions

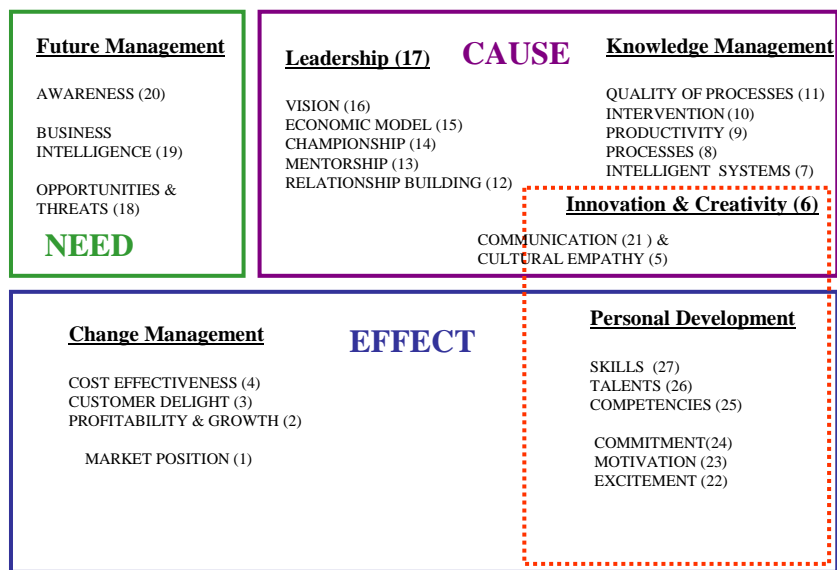


Figure 6: Holistic Business Parameters

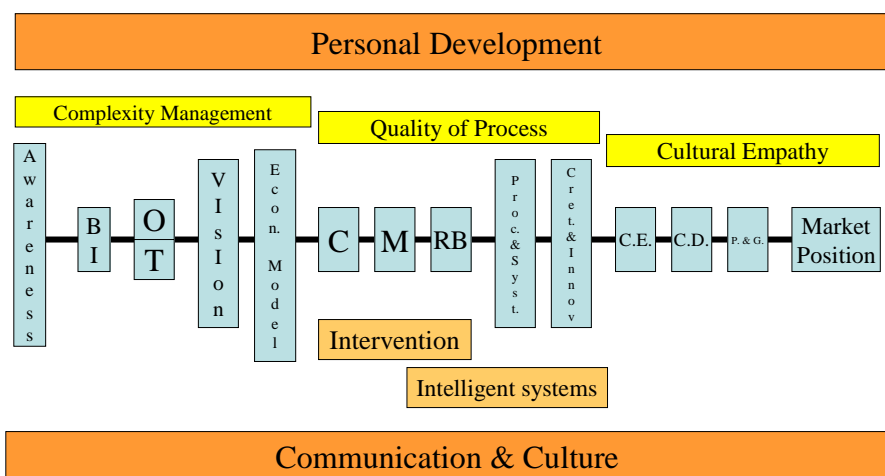


Figure 7: Individual Parameters

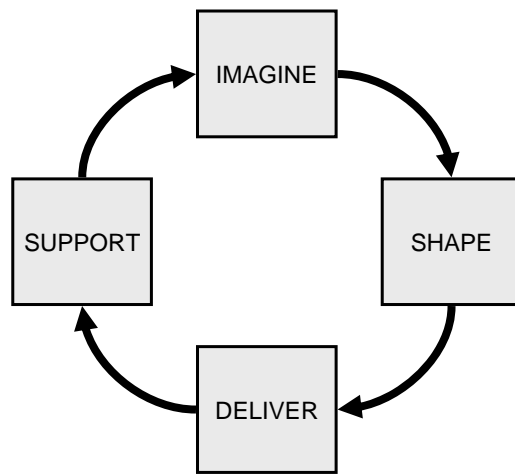


Figure 8: Ongoing cycle of renewal

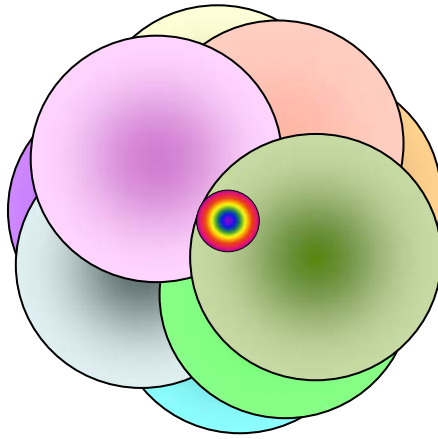
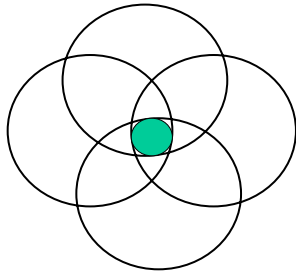


Figure 9: Total Integration

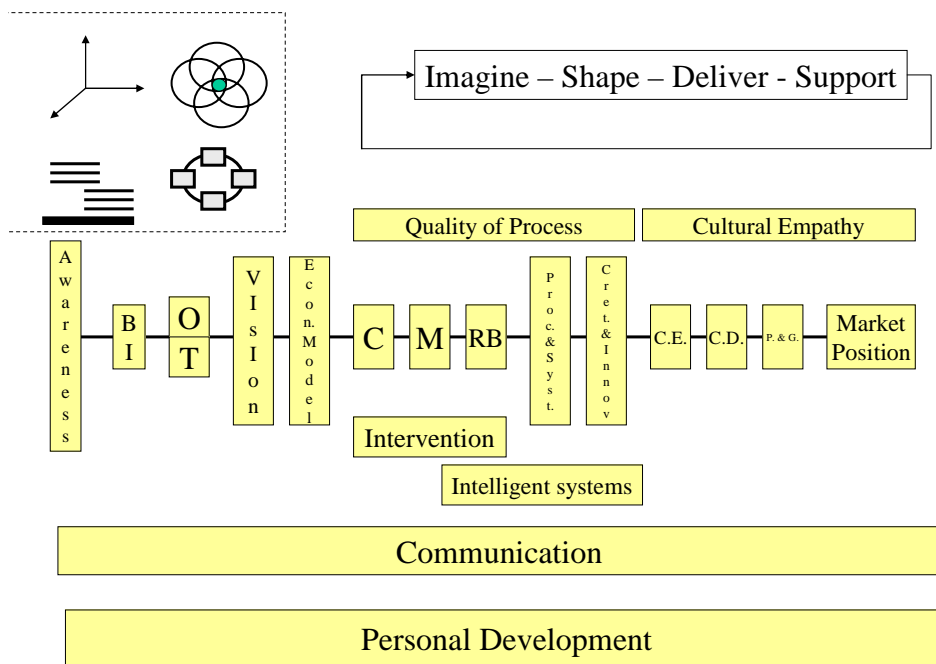


Figure 10: The integrated management model