

A FRAMEWORK FOR IMPLEMENTATION AND ASSESSING ENTERPRISE RESOURCE PLANNING SYSTEMS



E.A. Steyn

**A FRAMEWORK FOR ASSESSING ENTERPRISE
RESOURCE PLANNING SYSTEMS**

by

Etienne Ashley Steyn

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The Almighty Lord without whom I would never have had the ability to complete my studies.

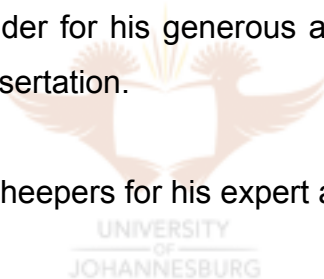
My mom and dad, for there support during my research and studies. Thank you for your understanding, upbringing and prayers.

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--oOo--

SYNOPSIS

Name : **Steyn EA**
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Study leader : **Mr Cor Scheepers**
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The aim of this study is to understand the definition of Enterprise Resource Planning Systems (ERP), explore the most distinct phases and steps used during the implementation life cycle and the different elements of project management.

All the fundamental concepts are evaluated during the various stages of the implementation and there is a highlighted detailed discussion on the implementation life cycle or the phases that a project needs to go through.

This content will concentrate on providing an overall understanding of ERP systems, the benefits that a company can achieve by implementing an ERP system, a clear understanding of the role and use of these systems and an understanding of the various approaches to implement ERP systems.

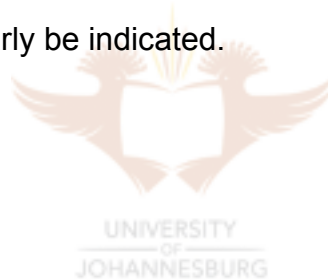
Before the start of any implementation or engagement a clear understanding of the approach or the order of the implementation steps needs to be understood. This allows transparency and provides the entity, that is about to implement the ERP system a clear framework description of the steps in the implementation process towards a successful ERP implementation.

The methodology that would be under the magnifying glass is one from SAP known as the Accelerated ASAP methodology. This methodology is usually customized by all the different implementers or consulting houses. However there would be specific reference made to the ASAP implementation methodology steps. The successful implementation by using structured project management methodologies and reporting has become increasingly important

and implementers always strive to refine and make changes to the standard methodology to fit to the needs of the implementation at hand. These elements where changes are made will be highlighted and discussed.

The assessment of the ERP system can be done from various perspectives and at different stages both during and after the implementation has been completed. There should be a clear understanding with regards to when the effectiveness of the system is being judged. The assessment for this study will be conducted from both the process owners as well as the consultants doing the actual implementation during the different stages of the implementation and after the implementation.

The focus will be on actual benefits and successes instead of costs involved with the implementation of the ERP Systems. Benefits will be discussed from an operational, strategic, infrastructure, managerial and organizational level. ERP project implementations yield substantial benefits to the entities that adopt them and these benefits will clearly be indicated.



CONTENTS

	PAGE
SYNOPSIS	1
TABLE OF CONTENTS	3
CHAPTER 1: AN INTRODUCTION TO ERP SYSTEMS	5
CHAPTER 2: UNDERSTANDING THE LIFE CYCLE AND PHASES OF THE ERP SYSTEM IMPLEMENTATION	26
CHAPTER 3: PROJECT MANAGEMENT AND THE ELEMENTS OF SUCCESS	49
CHAPTER 4: ASSESSMENT OF THE BENEFITS AND SUCCESSES OF ERP SYSTEMS	69
CHAPTER 5: EVALUATION, RECOMMENDATIONS AND SUMMARY	92
BIBLIOGRAPHY	98

Glossary of Abbreviations & Acronyms

ASAP	Accelerated SAP
BPR	Business Process Re-engineering
CEO	Chief Executive Offices
CSFs	Critical Success Factors
EAI	Enterprise Application Integration
EIS	Executive Information Systems
EP	Enterprise Portals
ERP	Enterprise Resource Planning
ISDMs	Information Systems Development Methods
IT	Information Technology
JIT	Just in Time
MSS	Business Supporting Systems
MSS	Management Supporting System
OSS	Operational Supporting System
PMBOK	Project Management Book of Knowledge
PMI	Project Management Institute
QA	Quality Assurance
ROI	Return on Investment
SAP	Systems Applications Program
SEM	Strategic Enterprise management
SWOT	Strengths, Weaknesses, Opportunities, Treads

CHAPTER 1

AN INTRODUCTION TO ERP SYSTEMS

CONTENTS

	<u>Page</u>
1. INTRODUCTION	6
1.1 What is Enterprise Resource Planning Systems?	8
1.2 The Evolution of Enterprise Resource Planning System	10
1.3 When do companies have an ERP system?	12
1.4 Motivations for ERP Systems	14
1.5 Strategic importance of ERP systems	15
2. ENTERPRISE RESOURCE SYSTEMS IN THE INDUSTRY	17
3. CRITICAL SUCCESS FACTORS FOR AN IMPLEMENTATION	19
4. IMPORTANCE OF BUSINESS PROCESS RE-ENGINEERING DURING ERP IMPLEMENTATION	21
5. OBJECTIVES OF THE SHORT DISSERTATION	23
6. METHODOLOGY	23
7. LIMITATIONS OF THE STUDY	24
8. STRUCTURE OF THE SHORT DISSERTATION	24

1. INTRODUCTION

The purpose of the research is to address the overall view of the implementation of enterprise resource planning (ERP) systems. An attempt is made to build a consensus from previous research and to derive an overall understanding of the key aspects and factors in ERP implementations. The research also focuses on the expected benefits according to the extent to which organizations engage in the design and development of the ERP system implementation.

This short dissertation will be of particular interest to those public sector institutions, medium size organisations and managers that are considering, implementing or analyzing their ERP implementation experiences.

Nicolaou (2003:1) states that the major advantage of ERP systems over application software suites lies in their consequent integration of accounting transaction processing with workflow, design, and engineering management. It is widely reported that enterprise-wide applications promise seamless integration of all information flowing through a company: accounting and financial information, human resource information, supply chain information, and customer information organization. They automate and structure an organization's business processes by providing reference models and process templates.

ERP systems come as standardized software packages from firms like SAP, Baan, Oracle, Peoplesoft, and JD Edwards, allowing customers to buy these standard requirements, rather than having to develop complex software solutions. In fact, they have become a preferred method for replacing previously developed systems that now define in-house legacy systems.

The power of the standard ERP solution lies in its automation of core business activities and the usage of e-business to enhance and make use of technology developments currently available. The power is further emphasised by the integration that is achieved in the business units that further contribute to the efficiency to which organisational functions are attained. The outcome of this allows these entities to function as a complete orbit.

The remainder of the short dissertation has been structured as follows. The next section briefly provides an overview of relevant ERP research, the evolution of ERP systems to the mid-market, before elaborating the strategic and tactical “critical success factors” (CSFs) for ERP implementations. The second section then outlines the implementation approaches and methodologies for ERP implementations.

In chapter four an assessment of the benefits and successes of ERP systems implementation are drawn, the future of ERP systems and the views of consultants versus business people on the successfulness of the system implementation. A few case studies would then be briefly discussed.

The ERP market, according to AMR Research was worth some \$15.68 billion in 1998 and is likely to continue its rapid growth at a compound annual rate of 36% to an estimated \$72.68 billion by the year 2002. In general, the benefits ERP systems offer not only increased decision making-speed, improved control of operations and costs, and cost reductions, but more importantly improved enterprise-wide information dissemination (Davenport 2000:8).

The systems at both public and private sector have evolved over 20-30 years as a variety of stand-alone and in-house developed systems that are expensive to maintain. These systems do not adequately integrate business processes across the firms and do not provide sufficient data for proper management reporting and analysis. This lead to the replacement of current systems with systems that are designed to process an organisation’s transactions and facilitate integration and real-time planning, production, and customer response.

Faced with this aging platform of disparate systems, and increasing business and compliance pressures these firms look to replace their systems with a fully Integrated Information System. The complexity of ERP systems, the dramatic organisational, cultural and human changes, and the often high customisation costs and implementation difficulties cause new customers to re-evaluate their ERP implementation plans.

ERP application is more than just an information system or some computer software, but it can be seen as a business philosophy based on private sector “best business/process practice”. At the end of the research it should be possible to have a better understanding of ERP systems – what they are the implementation lifecycle and the benefits that can be realised from it.

1.1 What is Enterprise Resource Planning Systems?

Every company is referring to Enterprise Resource systems and the way it can improve their businesses and help management to make more informed decisions, but what is Enterprise Resource Planning (ERP) Systems really?

Shanks et al. (2003) refer to ERP systems as generic “semi finished” products with database tables and variable parameters that can be customized, configured or integrated with additional third party software that support certain key areas within an organization. ERP systems are usually used to optimize a company’s day to day business whereby optimization can be seen as the process of reducing the space of potential problems and enhancement of the business by utilizing the integration between business units.



Computerworld (1998) describes the definition of an ERP system as software that automates finance and human resources departments and help manufacturers handle jobs such as order processing and production scheduling. ERP systems such as SAP AG's R/3 are notoriously complex, and installing the software often forces users to change their internal processes.

The implementation of an ERP system forces the business to do process re-engineering. Business Processes are readily mapped out according to “Best Practices” and business sometimes do need to change their processes and areas that it affects. A process can be defined as a sequence of logically related activities, tasks, or procedures with a goal and leading to an outcome (Thacker 2000:4).

Thacker also describes Business Process Re-engineering (BPR) as an approach to the problem from the point of view of the customer and of the process.

Customer views are required to ensure that the eventual design actually satisfies them. Process views are required to try to remove the in-tray problem, and to focus on the activity

Musaji (2002:1) describe ERP systems as a product that helps automate a company's business process by employing an integrated user interface, an integrated data set, and an integrated code set. Musaji (2002:2) further refers to ERP systems for enabling each department to know what is happening in the manufacturing plants and to get appropriate data in order to keep records up to date. Enterprise Resource Planning (ERP) System implementation is both an art and science that consists of planning, implementation, and ongoing maintenance.

The first main characteristic of integrated systems is that they combine separate records relating to the same subject into one related record held in the computer. The new product record contains all items of relevant data that were previously kept in six or more separate records.

Miller (2003:1) asks a few key questions that allow companies to think about what they might consider to be an ERP system. "Suppose your company has Oracle financials, PeopleSoft Human Resources, and SAP Strategic Enterprise management (SEM). Each of the constituencies sees themselves as the ERP system. Does my company have an ERP system? The answer from Miller (2003:8) "probably not, when not properly deployed".

ERP systems are the enablers of corporate transaction system coherency, and generally speaking, when you have more than one does not necessarily mean, that you do have an ERP system. The manner in which these systems integrate is the most important aspect. A lot of companies may have their own systems and processes and interaction between them, but might have limited or be highly reliant on manual intervention. This does not get concluded as an ERP system.

Miller (2003:5) also defines the term ERP as a new kind of manufacturing system that had material resource planning (MRP), finance, and human resources fully integrated (process and data) on a single database. ERP systems have

expanded since then to include advanced planning optimization (APO) and customer relationship management (CRM).

Paquin (2002:2) describes ERP systems as software packaged solutions “that integrate data across an organization and impose standardized procedures on the input, use, and dissemination of that data. An ERP system is a software model built around business processes that are considered the best practices of the industry.

In the view of all the descriptions a clear understanding of what an ERP system really is can be conceptualized. The common characteristics of all these definition summarizes the ERP system as a central database with all business processes that can be viewed, updated, and monitored through this single system in order for information to be shared across all functional departments.

1.2 The Evolution of Enterprise Resource Planning System.

Managers need to make better-informed decisions. It is essential to use information technology (IT) for this. The coming of age of IT has become a major driving force behind the change of attitude of the manager, as today's end-users and management are demanding executive information at the desktop. Shanks et al. (2003:102) claim that starting from the mid 1990's many firms have been replacing legacy systems that formed the base of the information technology capabilities with ERP systems.

These legacy systems originated to serve the information needs of manufacturing companies. Over time they have grown to serve other industries, including health care, financial services, the aerospace industry, the utilities industry and the consumer goods sector. Data integrity becomes critical. The computer cannot make human judgements.

If stock is moved, it is no good somebody remembering where they put it. The information needs to be put into the system or there will be a domino effect. An example is when stock is moved from location A to location B and the information is not put into the system. The system will tell someone to get the material from A and when it is not there, they have to go looking.

With this growth, ERP systems, which first ran on mainframes before migrating to client/server systems, are now migrating to the Web and include numerous applications (Musaji 2004:5). According to AMR Research, total revenue in the enterprise applications and services market in 1999 was US\$18.3bn. Software implementation cost is often reported to be five to ten times the cost of software licensing (Shanks et al. 2003:23).

The field of information systems has undergone dramatic changes since its inception several years ago. Information Technology is a very important element in the every day existence of the company. The evolution of computer systems have made management much more intense and at the same time made a business much more manageable.

According to Winslow & Bramer (1994:25) "Organizations and their executives are on a constant quest for the best way to be competitive, productive, efficient, cost-effective, profitable and successful". The information infrastructures of companies continue to mature and data quality and data management improves, which increases the need for more data driven, support and decision making systems, such as fully integrated ERP Systems.

"Cost is a major component of information technology in business but competitive advantage is the long-term benefit to be derived" as stated by Niebieszczanski (1994:23). Take executive information systems (EIS), which is a system that spans all business processes, enabling a manager to make better decisions, overall more effectively, save costs and deliver better services, that is the edge" (Niebieszczanski 1994:23).

After the implementation of ERP systems companies still change and enhance the ERP system with further capabilities to ensure that they always stay up to date with the latest developments and to ensure they have easier excess to information. ERP system developers always get feedback from the implementers of the software and do continuous development and improvement of the Software. New releases and add on packages always gets released and applied in order to give customers the development and support that they require.

1.3 When does my company have an ERP system?

Turbit (2003:2) states that the word "Enterprise" in ERP means that whatever happens in one area has a ripple effect in other areas. Understanding the implications of actions of one area, on other areas of the company, is not something that happens overnight. The company is completely affected in all areas because of the ERP implementation. Another important feature of identifying when the company has an ERP system relates to the factor of integrated systems. The process of multi recording and transcribing data to update separate records has been replaced by one single input to the computer record (Musaji 2002:2).

Miller (2003:4) refers to the following ERP checklist:

- Do all functions have access to and use the same data? In real time?
- Are the processes fully integrated? (i.e. position based budgeting sees the HR data, CRM sees and posts to live inventory data for orders)
- Can users seamlessly move from one function to another?

If the system fails on any of these three questions, you do not have ERP. Those companies that have homogenous customers and products can have one ERP system and should strive to get there. Those that must have more than one should seek to have as few as possible.

When ERP systems were introduced, the thought of purchasing a packaged system instead of coding a set of programs particular to a given manufacturing site was a very radical idea. The re-modelling process in changing to ERP systems was quite demanding. Business process re-modelling activities penetrated the whole project and involve people with quite diverse backgrounds.

The general expectation from ERP systems was that they would end the project failures while getting the new functionality online faster.

The true ambition for ERP systems according to Koch (2001:22) is to attempt to integrate all departments and functions across a company to create a single software program that runs off one database. ERP projects are usually based on parameterised or standard software components that are put together according

to some business needs. Conceptual models are not primarily needed for single components design and implementation, but they are used to analyse the various business options and they support the decision about how the components should be used to optimise the business process of the organization (Zanchi et al. 2001:3).

Miller (2003:6) states that in order to have corporate transaction system coherency everyone in the corporation has to be on the same page:

- The company has to decide to have common business practices
- The company has to decide to have a single data model

In order to have a full ERP experience, a company still has to address the fundamental reasons why it wasn't successful with the legacy systems. Then it has to purchase a system that supports what they have decided to do and that system must be fully integrated within itself. This means that a company has to purchase a system from exactly one vendor.

Miller (2003:7) addresses a very important question: Does an ERP system have to come from exactly one vendor? The answer is very simple there is no community of standards that define that: "...process meta model defines a way to describe how the object events stream completes both short-running and long-running processes".

Is such a strict interpretation of ERP worthwhile? It is for those companies whose business allows them to have a single global instance. Research shows that those companies are seeing a 40 percent reduction in the cost of IT as well as numerous business benefits stated by (Miller 2003:8).

However getting to a single instance takes time and a high level of commitment to overcome the obstacles. What then of the companies whose business do not really allow for a single global instance? These companies are typified by:

- The large conglomerates that have many unrelated businesses under a single corporate parent.
- The companies in industries where there is no ERP or CEA system that fully meets their needs.

These companies will have to use multiple vendors or live with less functionality.

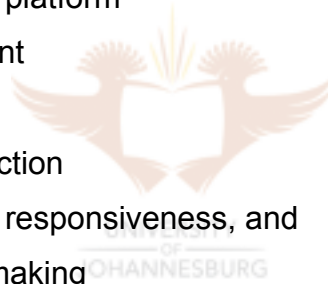
The less systems and software vendors there are in a landscape the easier it will be to share information and in the end, that is what ERP is all about

1.4 The Motivations for ERP Systems

Companies have different reasons why the investment in ERP systems is so essential. Sometimes their old legacy systems are just getting too expensive to maintain and alternative options are being explored. A dominant motivation for ERP systems is to provide a common systems platform.

According to Shanks et al. (2003:243) the six most common reasons cited for ERP implementations were the following:

1. Need for a common platform
2. Process improvement
3. Data visibility
4. Operating cost reduction
5. Increased customer responsiveness, and
6. Improved decision making



The emphasis of being able to make better and more informed decisions usually has a great impact on the decisions for companies to implement ERP systems. Data analysis and scenario modelling with ERP systems is less complicated and takes less time to execute. This allows management to make more informed decisions with the use of ERP systems. Most ERP systems have these capabilities as standard functionality.

Being more efficient and serving customers better means to minimizing the handling of orders and get the information from the accounting systems to the actual delivery. The Just-In-Time and the Balance Scorecard principals put a lot of pressure on these delivery standards.

According to Paquin (2002:7) other motivations towards ERP systems can be the following:

- Replacement of legacy systems
- Increasing pressures from globalization
- Increasing importance of Business Process Reengineering (BPR) and Just-in-Time (JIT) philosophy
- Industries trending toward software collaboration

Shanks et al. (2003:105) also indicate that data visibility is high on the motivation list for implementing ERP systems. Koch (2001:5) gives a perfect example: "...everyone else in the company can view the same information and has access to the single database that holds the order. When one department finishes with the order, it is automatically routed via the ERP system to the next department. To find out where the order is at any point, one need only log in to the system. With luck, the order process moves like a bolt of lightning through the organization".

The above type of functionality is what makes ERP systems unique. The reporting of the statuses of these processes is even easier and just makes ERP systems a must for most organizations. Shanks et al. (2003:357) state that "...we need a system that is capable of not only efficiently providing information for decision making, but also efficiently integrating all systems in our company".

1.5 Strategic importance of ERP system

The Implementation of ERP systems usually have some strategic implications within companies, where companies may have been more focused on cost savings the focus might shift to being more customer relationship oriented.

Paquin (2002:5) explains that major strategic organizational changes have resulted from the implementation of ERP systems. He identifies four actions as a result from an ERP implementation:

1. Downsizing and flattening of organizations
2. Decentralizing responsibilities and concentrating control

3. Modification of job descriptions
4. Increasing job responsibility within the organization

When ERP systems are implemented the information technology (IT) skill sets in an organization change vary significantly. ERP systems need to be integrated with operating systems, in-house databases, and legacy systems and there is a greater reliance on vendors for professional service support.

The enhanced decision making process after ERP implementations are also very inherent. O'Grady (2004:7) refers to Davenport (2000), citing a survey of CEOs, reports that 61% of respondents indicated that improving management decision-making was a motivation for implementing the ERP system. Although many organizations justify the implementation on the basis of better decision making

Davenport (2000:12) states that 'better' decision making may be interpreted to mean either generating the information that is currently available but doing it faster and with less human intervention or producing different types of information and conducting different types of analysis further indicates that ERP systems also eased the reporting process.

Shanks et al. (2003:99) identify a few important strategic benefits:

1. Support current and future business growth plans
2. Support business alliances
3. Build business innovation
4. Build external linkage with suppliers etc.
5. Enable worldwide expansions
6. Enable e-business with web-enabled ERP system implementations.

O'Grady (2004:10) states that "easier access to enterprise-wide data from real-time systems could enable new analysis to be undertaken, such as the reporting of multiple views e.g. by product, region, global or by distribution channel or reports by customer account and contribution margin versus by product and income".

Detailed analysis would have been too timely to produce before ERP systems existed". When companies start to operate globally ERP systems makes it much easier to consolidate and to plan on an international level, especially when all branches have the same enterprise systems running.

The strategic benefits are tremendous and the impact on better customer services, human resource activities and enhanced decision making is endless.

2. ENTERPRISE RESOURCE PLANNING SYSTEMS IN TRANSITION

Enterprise Resource Planning systems transition can be blamed on two major aspects namely cheaper and faster implementations. The market focus for ERP vendors changes from large companies to smaller mid-sized company implementations and the secondly the market share by the important software vendors.

Enterprise Resource Planning systems were mainly focused on large organizations with their inception. Shanks et al. (2003:1) state that "enterprise-systems are large scale-organizational systems..." Tagliavini (Not dated:2) states that the evaluation of the contribution of Enterprise Resource Planning (ERP) systems in terms of both value creation and economic returns is a difficult task, because of the organizational changes needed by their implementation as well as the difficulty in predicting the return on investment.

ERP systems were developed for manufacturing organizations that are very complex. 'Systems' where the interactions between the various functions (Sales, Distribution, Manufacturing, Materials, Finance, Human Resources, Maintenance) have to be managed towards a common purpose of delivering the customer's maximum value at the optimum price.

Arcweb (2004:1) states that "...ERP solutions as the information backbone for their internal business and production operations, while looking outwards for collaboration with their suppliers and key customers". Janstal (2003:1) indicates the changes that occurred: "In January 2002 I forecasted dramatic changes

among ERP vendors. Some vendors have merged with competitors.” “... ERP vendors have turned their interest to target small and mid sized customers...”.

Stackpole (2004:5) indicates the following change in the market “...SAP AG (Walldorf, Germany), J.D. Edwards, Baan Co. (Herndon, VA), and Oracle Corp. (Redwood Shores, CA). These vendors-their appetites wetted by estimates of 49% growth in the mid-market versus a 13% decline in the high-end ERP space...”. There are much more medium size companies that have adopted the implementation of ERP implementations.

According to Stackpole (2004:6) in May 1999 an AMR survey of 50 manufacturers in companies with revenues between \$10 million and \$250 million, 74% based their vendor selection on whether the suite offered tightly integrated supply chain management, e-commerce, or CRM modules.

The Application Service Provision (ASP) was a new development in the ERP market more mid size companies that found ERP systems to expensive. ASP according to Shanks et al. (2003:116) is defined as where applications, services and infrastructure get supplied over the web on a rental basis to small and medium enterprises (SME's). “In 2002 many companies and government institutions had adopted the ASP model successfully” (Shanks et al. 2003:77). This approach opened new doors for ERP systems to get into the market of small and medium enterprises.

Arcweb (2004:7) states that “based on the expanding European Union and the strength of the Euro, EMEA (Europe, Middle East, Africa) is the largest single market for ERP implementations, accounting for almost half of the software and services revenues”. “SAP AG is still the market leader for ERP systems. The company is the largest vendor of ERP systems. Their global market share is 12%” (Janstal 2002:2).

3. CRITICAL SUCCESS FACTORS FOR AN IMPLEMENTATION

In today's global marketplace, the pressures challenging traditional business practices are many and varied. Competition is fierce, resulting in new opportunities and new risks.

According to Shanks et al. (2003:181) the analysis of the Critical Success Factors (CSFs) identifies the critical role of organization's legacy on the implementation process and the importance of business process change and software configuration. Critical success factors can be divided between two phases, the planning (strategic) phase and the action (tactical) phase of the project. Planning issues can also be referred to as the strategic time where most of these issues get addressed before the actual start of the project (Shanks et al. 2003:184).

The identification of CSFs before the start of the project is rather critical for the successful implementation of ERP systems. "...how these factors can be put into practice to help the process of project management in ERP implementations". Esteves et al. (2004:1). Allen & Kern (2002:5) stress the importance of CSFs further "...strategy needs to be seen as driving the project tactics. In fact, projects that exhibit a high quality in both strategy and tactics are suggested to be more likely to succeed".

"...it's essential to evolve your strategy and embed the values and beliefs in your organization that will get the response necessary to achieve your strategy" Donovan (2002:2). Strategy is essential, the process of ERP system implementation can be seen as building a house, a plan and proper foundation is required before the bricks can be laid.

Extensive research has been done with regards to CSFs and Esteves and Pastor has collected most of all the CSFs found in the ERP literature and then, determined the similarities or patterns of communality between them. The next step was to map them in a matrix (see Figure 1).

Figure 1: Unified Critical Success Model

	Strategic	Tactical
Organisational	<ul style="list-style-type: none"> ↪ Sustained management support ↪ Effective organizational change management ↪ Good project scope management ↪ Adequate project team composition ↪ Comprehensive business process reengineering ↪ Adequate project champion role ↪ User involvement and participation ↪ Trust between partners 	<ul style="list-style-type: none"> ↪ Dedicated staff and consultants ↪ Strong communication inwards and outwards ↪ Formalized project plan/schedule ↪ Adequate training program ↪ Reduced trouble shooting ↪ Appropriate usage of consultants ↪ Empowered decision-makers
Technological	<ul style="list-style-type: none"> ↪ Adequate ERP implementation strategy ↪ Avoid customization ↪ Adequate ERP version 	<ul style="list-style-type: none"> ↪ Adequate software configuration ↪ Legacy systems

Source: Esteves et al. (2004:5).

Shanks et al. (2003:184) indicates the following strategic factors:

- ↪ Business vision is the clarity of the business model behind the implementation of the project
- ↪ Top management support is the level of commitment by senior management in terms of their involvement and willingness to allocate valuable resources from the different departments
- ↪ Project schedule/plans in terms of milestones

Esteves et al. (2004:5) further adopted the Unified Critical Success Factors model and noted that the ERP implementation problem includes strategic, tactical, organizational and technological perspectives.

They ordered the number of citations in the research studies and the related perspectives influenced the order of the CSF's to be listed in Figure 2.

Figure 2: CSF's by Perspective

		Sustained management support	10	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Strategic	Effective organizational change management	7	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Good project scope management	6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Adequate project team composition	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Comprehensive business process reengineering	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		User involvement and participation	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Project champion role	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Organizational		Trust between partners	2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Dedicated staff and consultants	6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Strong communication inwards and outwards	6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Formalised project Plan/schedule	6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Tactical	Adequate training program	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Reduced trouble shooting	4	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Appropriate usage of consultants	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Empowered decision makers	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Adequate ERP implementation strategy	4	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Strategic	Avoid customization	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Adequate ERP version	1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Technological	Tactical	Adequate software configuration	2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		Legacy systems	1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Source: Esteves et al. (2004:6).

Esteves et al. (2004:7) indicates that under the strategic management, CSF's managerial support, proper change management, project scope management and project team composition are the most important Critical Success Factors for an ERP implementation. The organizational aspect indicated that dedicated staff and consultants, a good communication plan both inwards and outgoing and formalized project plans and schedules that need to be followed.

The importance of Top Management involvement gets repeated in all of the research that has been conducted. Thus it is important that a CSFs model get determined and it gets considered as important. Chapter 2 will go in more detail when the actual implementation lifecycle gets discussed and the importance of the CSFs gets more emphasized to ensure a successful ERP implementation.

4. THE IMPORTANCE OF BUSINESS PROCESS RE-ENGINEERING DURING ERP IMPLEMENTATIONS

According to Esteves et al. (2004:5) there is a relationship between the alignment of business processes and the ERP business model and related best practices. This process will allow the improvement of the software functionality according to the organization's needs. Managers have to decide if they do business process reengineering before, during or after ERP implementation.

Proceedings of the 35th Annual Hawaii International Conference on System Sciences described process re-engineering as socially validated ways of interpreting, judging and reacting to business current processes. The implementation of ERP systems and process reengineering can be seen as attempts to change organizational culture at its "deepest level". ERP application is more than just an information system or some computer software; it is a business philosophy.

There is a great reluctance to re-engineer processes; they have their cultural ways of doing things which they don't want to change at any price. "We try to get them to do things in a way that will be more suitable for ERP and you just hit the academic brick wall. We don't do it that way, and we won't do it that way", so what we've ended up doing is really trying to bend ERP out of all shape to fit the old style practices and processes as stated by Allen & Kern (2002:10).

Business Process re-engineering makes ERP implementation more complicated. The best of processes in the different industries where ERP systems has been developed has been mapped and proven to be the better option. ERP system are build according to certain business processes and in most cases the business need to adopt to the new way of doing the business rather then changing the software.

According to Shanks et al. (2003:320) the business engineering phase includes the creation of awareness of the required IT and organizational change, the documentation and the analysis of the current situation.

Business engineering is a critical step during the “Blue Print” phase of the implementation and a lot more detail and attention would be given to this very important aspect. In chapter two during the discussion of the blueprint phase much more detail would be discussed.

5. OBJECTIVES OF THE SHORT DISSERTATION

The key objective of this short dissertation is to highlight a better understanding of Enterprise Resource Planning Systems, the congruence between the theory of the implementation process as well as the assessment of the implementation during the different stages of the process.

The important and relevant implementations lifecycle stages would be highlighted by focusing on the fundamental concepts and methodologies that exist to ensure more successful implementations. To get a clear understanding of the role and use of these systems as well as an understanding of approaches to evaluating and selecting enterprise resource planning systems.

An integral chapter of the short dissertation emphasizes the positive alignments that have resulted from the effective use of technology as well as benefits gained from efficient business re-engineering. The objective of this study is to offer insight into better-informed decision-making and the assessment of ERP systems implementations.

Finally, the aim of this study is to address the importance of how to get insight on how these risks and benefits can be better utilized to make better and more informed decisions and to have a better overall perspective of ERP systems implementations and all the aspects attached to that.

6. METHODOLOGY

This study consists of a literature study in the form of textbooks, research publications, business periodicals and other publications, including Internet publications and case studies.

7. LIMITATIONS OF THE STUDY

Enterprise Resource Planning Systems have only been available for part of the past century. The resources in general were not a problem, but the views on ERP systems are still much focused and a lot of case studies are still underway. The resources and literature focuses mainly on the larger ERP systems that are currently in the market. Case studies in South Africa are limited and the experience in a South African context is fairly limited. A few South African Case studies would be evaluated

8. STRUCTURE OF THE SHORT DISSERTATION

CHAPTER 1 introduces the short dissertation, giving the background of ERP systems and describing the overall objective of the project. It provides insight into the role of information technology and impact of ERP systems. It discusses the importance of the identification of Critical Success Factors and the concept of business process re-engineering in an ERP context.

CHAPTER 2 highlights the implementation approach, implementation steps and the methodologies used to ensure better success rates with ERP Implementations.

CHAPTER 3 discusses the aspects and the elements of ERP system project management approach.

CHAPTER 4 discusses the measurement of the successes and the benefits of ERP systems, and takes a closer look at lessons learned from previous case studies on ERP implementations.

CHAPTER 5 concludes the findings and recommendation for ERP systems.

Everything in life has a specific lifecycle that needs to be followed, ERP systems are no different. One of the important aspects to implement ERP systems successfully is to follow the lifecycle that has been laid out by the different project

methodologies. There are different lifecycles formats but the need for implementing ERP systems more aggressive evolved in lifecycles that include more steps in one cycle to fast track the implementations.

Donavan (2002:1) states that “Implementing ERP is like constructing a building. You can't start off by putting a brick in mid air. First, you need to lay a solid foundation. Then, as quickly as the process will allow, you need to carefully place and secure the bricks on the foundation. Preparation can make or break the success of an ERP implementation”. Chapter 2 will focus on ERP implementation lifecycles and the different phases within the cycles.



CHAPTER 2
UNDERSTANDING THE LIFE CYCLE AND PHASES OF THE
ERP SYSTEM IMPLEMENTATION

CONTENTS

	<u>Page</u>
1. INTRODUCTION	27
2. STRATEGIES FOR THE DEVELOPMENT OF A PROJECT APPROACH	28
3. PHASES OF PROJECT IMPLEMENTATION	30
3.1 Project Preparation	32
3.2 Blueprint Phase	33
3.3 Realization Phase	38
3.4 Final Preparation Phase	40
3.5 Go Live and Support Phase	42
4. FACTORS AFFECTING THE IMPLEMENTATION APPROACH	43
5. CONCLUSION	48

1. INTRODUCTION

Enterprise Resource Planning (ERP) systems are enterprise wide systems because of their integration and automation of a company's business processes. They have rapidly become the de facto industry standard for the replacement of legacy systems. Because there is evidence that the overwhelming majority of ERP implementations exceed their budget and their time allocations, researchers have begun to analyse ERP implementation in case studies in order to provide an implementation framework which maximises efficiencies.

In this chapter the implementation approach, implementation phases and implementation methodologies would be discussed. The base implementation approach that will be under the magnifying glass is the Accelerated-SAP (ASAP) methodology or implementation approach. This approach is utilised by SAP AG the market leader in ERP systems and the SAP implementation partners for SAP.

There are several similarities between this methodology and other methodologies used by other ERP vendors. The consulting firms that do the implementations normally adopt the methodology and make certain process changes to the steps and the methodology that might work better and includes adding and deleting alternative steps, but the baseline concept used within the implementation of ERP systems remains the same.

The most apparent similarities and evident differences will be addressed to understand the phases and lifecycle during the implementation of an ERP system. Critical analysis of information systems development methods (ISDMs) has been a research study that has been conducted for many years. ERP systems implementation methods "... are mostly developed by ERP vendors and ERP consulting firms to support the implementation of ERP systems" as stated by Markus et al. (2000:123).

2. STRATEGIES FOR THE DEVELOPMENT OF A PROJECT APPROACH

To deliver the total ERP system business solution including process, business rules and system configuration on time, on budget and within defined quality standards that meet the business requirements a well defined plan and map should be in place.

This focuses on establishing a systematic development approach ensuring the integration of each major system component. This approach allows us to:

- Integrate systems at the earliest possible stage
- Allow a gradual introduction of system's key concepts
- Give client the opportunity to foster ownership and involvement progressively throughout the program (TUI Consulting Not Dated:4).

All the major ERP vendors in the market have developed their own methodologies. "...Accelerated-SAP (ASAP) from SAP, Implex from Intenia and JD Edwards One, the methodology from JD Edwards ..." as stated by Rashid et al. (2002:45).



According to Hedman (2002:7) the ASAP methodology applies a reversed logic of analysis and design in the implementation, where the implementation process begins with the design followed by the analysis. The ASAP method is viewed as an artefact, where the paradigmatic framework has been used as an evaluation framework for positioning constructs and concepts.

There are professional associations promoting ASAP and there are newsgroups on the Internet representing informal networks and are cited in case studies. ASAP is a well established methodology in the market and is regarded a market leading ERP system methodology. It is used in education via the university alliance program between SAP and about 400 universities around the world. "The method has both practical and educational relevance for students" as stated by Hedman (2002:54).

“ERP market leaders are SAP AG (39% of the world market) Oracle Corporation, Peoplesoft Inc and Baan Co.” as stated by Piszczalski (1997:76). Early accounts of ERP implementation distinguished only between a phased and a big bang approach. More recent studies have highlighted the many differences between ERP implementations.

Martin (1998:4) states that “... 90% of ERP implementations exceed both their budget and the allocated time frame, so a tool that assists in the determination of realistic project scope is crucial”. The above statement supports the transition of ERP systems that was discussed in chapter one. ERP systems now focus on more small and medium size businesses with less money to spend and not enough time to do a comprehensive implementation. The ASAP methodology is a typical example of an implementation strategy to facilitate and support such low budget implementation.

Siemens Business Services (2002:1) notes that ASAP was released over five years ago, and has since been used in more than 1,000 projects worldwide. More than 18,000 SAP or partner consultants have been trained in ASAP. Implementation partners have indicated that some of them add additions to the standard methodology where certain aspects modified.

The amount of effort and adjustment to the implementation strategy approach depends on the complexity of the project. Parr (Not Dated: 2) characterises the ERP implementation in three main areas. They are discussed below:

Comprehensive Implementation

Apart from the physical scope of the project, there are implementations that require the full functionality of the ERP systems. Occasionally this may involve the commissioning of industry specific modules and additionally there are multiple sites, usually with independently evolved business processes. The scope and level of Business Process Re-engineering (BPR) requirements are high and the complexities described above imply large resource allocation.

Middle of the Road Implementation

This category is, as the name suggests, mid-way between a Comprehensive and a Vanilla implementation. Characteristically, there are multiple sites (although there may be only one extensive site), and a major decision is to implement a selection only of the most required ERP modules for the business to operate their core businesses.

Vanilla Implementation

This is the least ambitious and least risky implementation approach. Typically, the implementation is on one site only, and the number of prospective system users is small. A decision is made to have core ERP functionality only, and to do minimal BPR in order to exploit fully the process model built in to the ERP system. This decision essentially is a decision to align company processes to the ERP rather than modify the ERP to reflect unique business processes. These systems are the least complex, and typically they may be implemented in 6-12 months.

3. PHASES OF THE PROJECT IMPLEMENTATION

The embedded Accelerated-SAP (ASAP) focuses on the actual system implementation and the processes of the implementation steps. According to Shanks et al. (2003:320) ASAP roadmap includes the five sequential tasks of project:

- Preparation
- Business blueprint
- Realisation
- Final preparation
- “Going live” and Support

Shanks et al. (2003:319) give an overview of some proposed lifecycle models, they are include the following cycles:

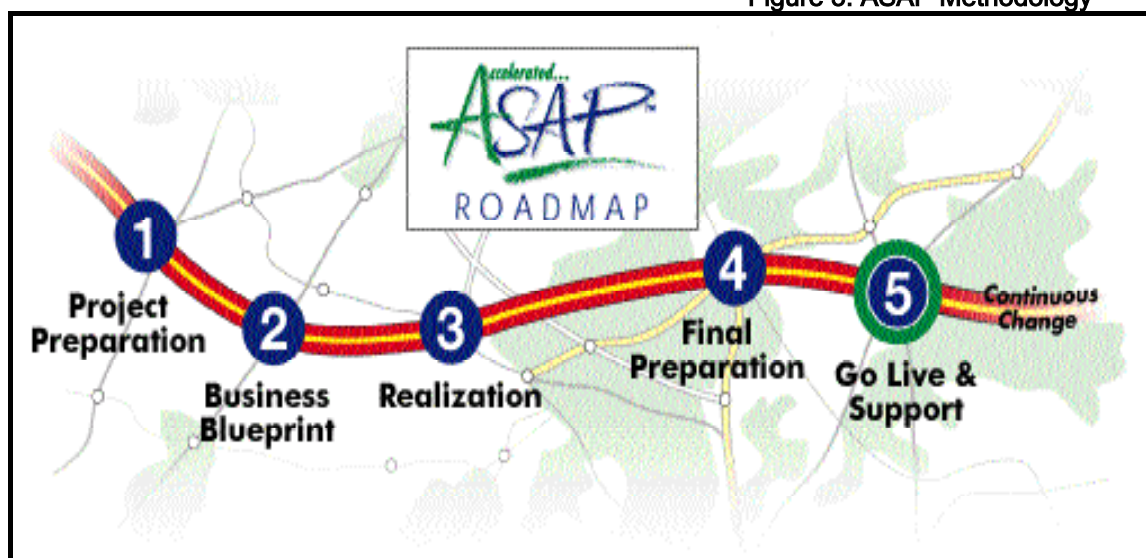
- Focus, as-is, to-be, construction and testing, and actual implementation.

- Consulting process, selecting the ERP system vendor, implementing the software, and learning and knowledge transfer.
- Initiation, planning, analysis with process design, realisation, transition and operation.

SAP is the world's most used ERP system and the most information and data analysis studies has been done on the SAP ERP system adoption and performance. "Given that SAP has over 75% of the ERP market today at large firms, we are confident that we capture most of the ERP installations. Hitt et al. (Not Dated: 2). All SAP projects are implemented using a standardised methodology known as ASAP. This methodology ensures a successful implementation through structured project management methodologies and reporting tools.

The ASAP methodology can be customised to meet client specific requirements. SAP projects require a thorough and comprehensive Business Blueprint which becomes the client's, centralised business process repository. This repository then becomes the basis for all the training, future solution changes and external audits. Solution configuration cannot begin without a complete documentation of the business processes. SAP solutions are therefore totally business solution oriented. Figure 3 depicts the ASAP Roadmap, as defined by SAP AG (1999).

Figure 3. ASAP Methodology



Source: SAP (1999)

The methodology consists of five phases presented as a roadmap. The roadmap contains only one road, making navigation much easier, with different check points during the implementations. The five phases which are depicted will further be discussed in more detail.

3.1 Project Preparation

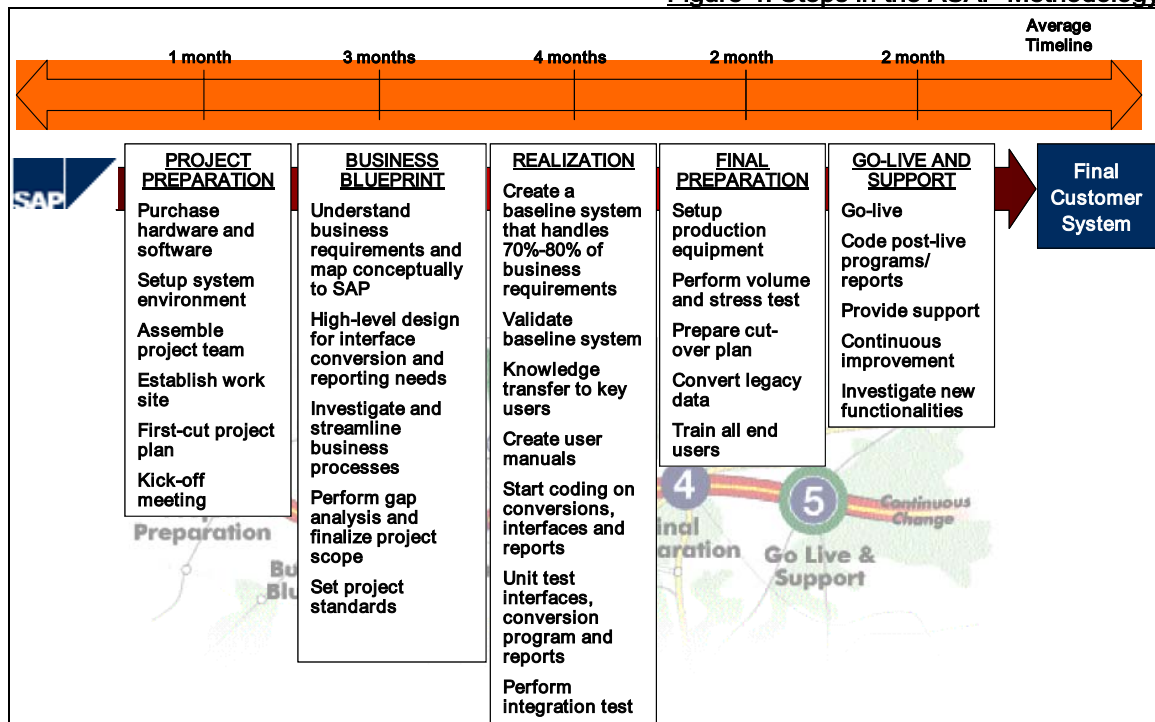
This is the phase that indicates the start of the project. A few of the activities within this phase starts before the project even commences. The project preparation phase provides assistance in the initial planning and preparation for the project.

This objective of this phase involves defining the project, specifying the scope, deciding on an implementation strategy, specifying the project schedule, formalising a project plan and the sequence of implementation, establishing the project organization and steering committees, and assigning resources.

A view of the implementation process which was derived from discussion with 20 practitioners and from studies of three multinational corporation implementation projects by Bancroft, Seip and Sprengel has brought about the Bancroft model with five implementation phases according to Shanks et al. (2003:199). The focus phase as step one in the implementation approach have a lot of similarities with the ASAP model. "The focus phase is essentially a planning phase, in which key activities are the set up of the steering committee, selection and structuring of the steering committee and creation of a project plan" as stated by Shanks et al. (2003:1999).

Figure 4 below is a picture that outlines the roadmap and is a methodology and project plan with detailed descriptions about what, why and how certain activities are performed, and who performs them. "It makes sure that nothing is left out and that project management plans well in advance for the execution of activities such as end user training" (Siemens Business Services 2002:1).

Figure 4. Steps in the ASAP Methodology



Source: (SAP 1999)

3.2 Business Blueprint

During the Blueprint phase detailed workshops will be conducted by the project team with various key users from the customers. The workshops will gather business requirements and also demonstrate the software capabilities. The analysis is the gathering of the business requirements and the current processes that the customer currently has in place. This is a rather extensive exercise and very time consuming.

Existing processes will be reviewed and re-designed where applicable. New processes will also be designed to meet the business requirements. The purpose of reengineering is to "make all your processes the best-in-class." Frederick Taylor suggested in the 1880's that managers could discover the best processes for performing work and reengineer them to optimize productivity (Weicher et al. Not Dated:2).

Using as a starting point the "as is" processes already documented by the customer, this phase is where the "Packaged-based Re-engineering" takes place. The implementation team will facilitate BPR sessions to ensure that best practices from the ERP systems are considered when determining the future processes.

Fitz-Gerald et al. (2003:3) state that achieving business process improvement and control are key investment incentives. These incentives include operational or tangible benefits, managerial benefits and organizational benefits that include the following:

- Cost reduction
- Improvements in cycle times
- Productivity
- Quality and customer services;
- Resource management
- Decision making,
- Planning
- Performance
- Support to organisational changes
- Facilitation of business learning,
- Empowerment
- Building common visions

The re-engineering process focuses on eliminating work that is not necessary and finding better, more effective ways of doing the processes or tasks. Weicher et al. (Not Dated: 7) states that BPR must be accompanied by strategic planning, which addresses leveraging IT as a competitive tool. "Place the customer at the center of the reengineering effort -- concentrate on re-engineering fragmented processes that lead to delays or other negative impacts on customer service. BPR must be "owned" throughout the organization, not driven by a group of outside consultants".

Davenport et. al. (1990:16) prescribe a five-step approach to BPR:

- *Develop the business vision and process objectives:* BPR is driven by a business vision which implies specific business objectives such as cost reduction, time reduction, output quality improvement, learning and empowerment.
- *Identify the processes to be redesigned:* Most firms use the *high-impact* approach which focuses on the most important processes or those that

conflict most with the business vision. Lesser number of firms use the *exhaustive* approach that attempts to identify all the processes within an organisation and then prioritise them in order of redesign urgency.

- *Understand and measure the existing processes:* This is done in order to avoid the repeating of old mistakes and to provide a baseline for future improvements.
- *Identify IT levers:* Awareness of IT capabilities can and should influence process design.
- *Design and build a prototype of the new process:* The actual design should not be viewed as the end of the BPR process. Rather, it should be viewed as a prototype, with successive iterations. The metaphor of prototype aligns the BPR approach with quick delivery of results and the involvement and satisfaction of customers.

Weicher et al. (Not Dated:5) note that during the implementation stage, it is recommended that companies follow these basic rules:

- Recognize that information technology (IT) is only part of the solution: it allows managers to collect, store, analyze, and communicate and distribute information better.
- Cut and paste the IT tools needed.
- Bring in internal or external IT experts: their knowledge, skills, acumen, and experience are invaluable.

After implementation, continues monitoring performance and keep up with new IT developments. The implementation team and the customer agree and sign-off on after the blueprint documents. This will supersede and replace the agreed project scope prior to the commencement of the Blueprint.

This phase is where the benefits of the extensive project team training phase will markedly show in the capability and knowledge of the project team. As the team considers redesign of business processes they more fully understand the

integration capabilities of the system and can confidently make process decisions based upon knowledge, not speculation.

The Bancroft implementation model second phase known as “the As Is Phase” involves analysis of current business processes, installation of the ERP system, mapping of the business processes to the ERP functions and the training of the project team as stated by Shanks et al. (2003:200).

TUI Consulting (Not Dated:5) provides a summary of the key activities for the Blueprint Phase:

- Analysis of relevant business documents including business processes, business rules, policies and procedures and strategies.
- Conduct scenario and process level workshops with key personnel responsible for executing the business processes as well as the business process owners.
- Document and validate workshop analysis with business process owners.
- Define and finalise business blueprint and baseline scope documents.
- Document and validate system analysis with business process owners and experts.
- Document process, scenario and procedure level design.
- Identify and document key interfaces and developments.
- Identify and document system enhancement requirements
- Refine the original project goals and objectives
- Define the baseline scope
- Refine the overall project schedule and implementation sequence

The project team from the customers perspective needs to sign-off after the analysis and business process re-engineering has been completed. Users need to do a reality check of their design and confirm their thinking of the ‘to-be’ scenario in the SAP system (TUI Consulting Not Dated:3). This approach will help minimise rework and last minute changes to design, helping timely implementation of the system. This approach also enables a higher degree of user acceptance of the new processes and system to be implemented.

“... even if the vanilla ERP approach is adopted, some BPR is inevitable, particularly when legacy systems are involved” as stated by Parr (Not Dated:11). Where gaps may have existed between available and required functionality the consulting firm would have helped the customer to determine whether the gap is a critical requirement and whether the business process can be changed.

There are a number of tools that are utilised during the ASAP methodology to track all the changes and to facilitate the business process re-engineering process. Weicher et al. (Not Dated:5) indicate a few tools that are used during the implementation process and specifically with the blueprint phase, they are the following:

- Graphics software and CASE tools used for the production of process maps;
- Spreadsheets and costing software allow for activity-based cost analysis;
- Databases can track customer satisfaction and complaints;
- "blind" e- mail bulletin boards can be used to capture employee suggestions;
- E-mail and groupware can facilitate communication and coordination across geographical and organizational barriers.

All gaps are logged in a gap database to ensure they are tracked. If the functionality is required due to statutory or regulatory requirements, an enhancement will be prioritised as critical. The level of training and skills gained throughout the preparation phase will enable the development of a robust blueprint document as stated by TUI Consulting (Not Dated:4).

When the project team undertakes the project team training, the senior management will be engaged in workshops to assist the project team in the following areas:

- Reviewing design strategies including the extent of change required in business processes, empowerment of business process owners,

delegations, responsibilities, accountabilities and corporate governance issues.

- Developing an initial framework for the future Support Organisation and Governance as stated by TUI Consulting (Not Dated:6).

According to TUI Consulting (Not dated:39) the gaps in the business processes requires executives and the ERP teams to take a few crucial steps:

- 1) Examine a business process to match an ERP function;
- 2) Enhance the business process to meet the needs of the desired ERP system outcome;
- 3) Employ middleware to bridge the gap;
- 4) Determine if it is necessary to add a custom bolt-on application for a critical function that the ERP system

When the blueprint phase has been executed successfully the mapping of the processes to the ERP system evolves into the realisation phase where prototyping and configuration of the system takes place.

3.3 Realisation Phase

This phase will involve the configuration and development of the Enterprise Solution. The definition of configurable according to Shanks et al. (2003:2) is to customise and tailor the product to the customer's business requirements using parameter settings provided by the vendor of the ERP system.

The blueprint documents which have been developed according the business processes will be used in the configuration of system. The reporting in the software will be enabled through data generated within the new system by using tables and standard reports.

During Realisation, the team develops a system that is robust and complete so that the testing phase can be executed. Realisation phase of the project also requires skills and experience to ensure that the system is thoroughly developed and tested. The testing of the system requires co-operation between both the project team and end users.

During the start of the build phase 80% of the basic processes gets configured fairly quickly and the rest of the 20% will get mapped with more difficulty, requirements because of every company's uniqueness. The solution requires thorough testing after the build phase. This will ensure a bug-free and robust system is rolled out to the organisation. The combination of a well and robustly developed and tested system ensures that the project timelines will be met with high degree of user acceptance.

The Bancroft Model according to Shanks et al. (2003:200) "To-Be Phase" entails high level design and then detailed design subject to user acceptance, followed by interactive prototyping accompanied by constant communication with users.

Throughout the lifecycle of the implementation there will invariably be issues that must be escalated to management to review business rules, obtain more detailed definition and guidelines on regulatory requirements, or obtain clarity on the future direction of the business and the impact on processes. Management commitment is emphasised throughout research conducted for ERP implementation. In a later chapter more detail would be dedicated to this topic.

"Timely resolution of these issues will require the commitment and co-operation of project management, sponsors and key decision makers" as stated by TUI Consulting (Not Dated:4). TUI Consulting (Not Dated:4) refers to the following activities as the key activities for the realisation phase:

- Complete SAP configuration.
- Build developments for enhancements, workflows and essential reports within development standards and frameworks.
- Manage data transports through all relevant development, quality assurance and production system platforms.
- Build data conversion tools and execute trial uploads from legacy systems.
- Prepare initial version of Go-live Cut-over Strategies.
- Conduct initial unit and integration testing of process scenarios and batch processing.

- Develop batch-processing strategies.
- Start development of end-user training materials and systems.
- Continue change management communications.
- Develop authorisation profiles for security on the system.
- Finalise the support organisation (including resources and management) and Governance.
- Prepare and test production environment hardware.

The creation and of the support teams made up out of the customer's users and the implementation functional and technical consultants who will formally complete and document each of the following Realisation Phase components in a controlled environment.

3.4 Final Preparation

During this phase the project and all the resources are getting ready for the last phase in the lifecycle – “final preparation”. This phase includes testing, end user training, system management and cutover activities, and finalising readiness to “go live”. The Final Preparation phase also serves to resolve all crucial open issues that might still be outstanding in the issue database.



The implemented ERP solution requires various testing steps to ensure that any errors are eliminated before the system goes into production. This requirement is driven by the mission critical nature of the application and the importance of the reliability of the system to ensure that the business can continue doing ‘business as usual’.

The test phase is also utilised to train additional super users from the business for additional support during Go-Live according to TUI Consulting (Not Dated:4).

The testing schedule is broken down into specific phases. Each of the major test phases has specific objectives, which have been set out below:

- Unit Testing - Each individual transaction is tested as a unit, confirming that transactions function on their own. Unit testing is driven off a unit test plan and takes place after configuration has been completed. The unit testing



formalises all the individual transaction tests that were undertaken during the configuration phase. Unit testing is executed in a formal test environment with controlled data sets.

- Integration Testing - The integration testing follows the unit test phase and is executed in a similar fashion. When testing the business scenarios, the process exceptions are identified as well, ensuring the testing process simulates all possible business variances of each scenario. The process scripts are also structured to ensure all integration points are accounted for. Process testing is also driven off test scripts.
- Process Testing - During this test phase, the system is tested with scenarios that are expected to take place during the day-to-day operations of the system. The objective of this test phase is to ensure that all integration points are functioning properly and that the system is capable of meeting the business' functionality requirements. Validity of outputs for each process tested is measured against expected outputs for that specific test. Process testing utilises specific scenarios, which cover a broad spectrum of system functionality. The scenarios are defined at the beginning of the project as described in the previous phases.
- User Acceptance Testing - User acceptance testing acts as a final sign-off from the business on all processes. During this phase, the process owners are brought in and walked through the processes.
- Stress Testing - The stress-testing phase is utilised to test the system under production-like loads in a normal working environment, as well as workloads under exceptional circumstances such as a major outage.
- Conversion testing - Initial tests are carried out to ensure that data will be migrated properly and will be in a usable form to continue business operations.

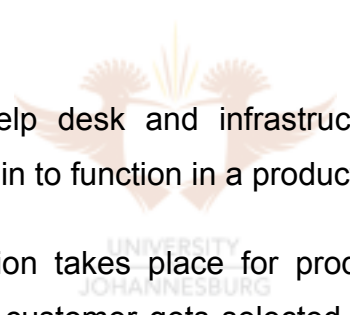
During this phase and while the training is underway the cutover strategy needs to be formulated. "The cutover strategy can be defined as a detailed cutover strategy task list, generated during the realisation phase, will be closely managed and constantly updated by team leads to ensure all tasks are completed on schedule" as stated by TUI Consulting (Not Dated:4).

A very important last step is to ensure that the system environment governance procedures should be signed off and agreed between all the stakeholders. The governance defines all the policies, procedures, rules and approach to supporting the system, undertaking changes, applying updated technical notes (patches) and undertaking upgrades to the latest releases from the ERP vendors.

3.5 Go Live and Support

This phase is a move from a pre-production environment to live production operation. After all the testing has been completed and all the relevant stakeholders has been consulted and they have decided that the solution is ready to move to a production phase the “go live” would commence and a specific date will be decided on.

TUI Consulting (Not Dated:8) states the following list of key activities for this phase:

- 
- Vendor support, help desk and infrastructure support teams become operational and begin to function in a production mode.
 - Final data conversion takes place for production system cutover. The ideal period for the customer gets selected with an allocated period over which the legacy system is shut down.
 - After cutover, catch-up entries and transactions are uploaded to cater for those transactions that would be outstanding during legacy system shutdown.
 - The client project team or newly created support team would take-over operational control of the system including batch runs.
 - The client’s new operational procedures, support structure and system governance come into effect.
 - The client’s help desk manages all user queries.

- The consulting firm will continue to support the client's support team but will not undertake production processing of transactions.
- This phase is also used to monitor system transactions and to optimise overall system performance. The system is now in full production mode.

After the system has been configured, tested, and the training has been done it is time that the solution needs to be rolled out to the client. After the roll out the implementation partners would normally stay and help stabilise the system, until the users are comfortable using the system and performing their tasks.

4. FACTORS AFFECTING THE IMPLEMENTATION APPROACH

“One of the most commonly-cited reasons for failure is poor project management during implementation” (Lain 2001:6). There is a continuous need to establish a highly competent and complete multidisciplinary team that is able to have an informed opinion on all relevant issues. The problems that occur in ERP implementations are due to a lack of preparedness and to a failure to understand the problems early enough that something can be done about them. There are certain important critical success factors (CSF's) that form part of the project management approach that needs to be discussed briefly

Create the Vision

A vision answers the question, “what do I want my new operating environment to look like when I'm done”? Veinbachs & Wyatt (2000:2) say “The answers to this question and other similar questions will establish the foundation on which the implementation will build, including implementation priorities and timing, specific technologies to deploy and even how the reengineered business processes must function”. It is not common for companies to define a vision before they start with their implementation.

The vision will drive the implementation through completion. Defining the vision up front will allow for intelligent design decisions later on – that is, the system can be configured properly from the beginning, minimizing rework as the

implementation moves forward. “A vision establishes a common end point with identified benefits and strategic advantages that keeps the project team focused and energized, even though the final destination may be months away and continually shifting” (Veinbachs & Wyatt 2000:3).

The project plan and the vision should be aligned and closely related to encompass the smooth implementation of the ERP system.

Understand the Return on Investment

Implementing an ERP requires a substantial investment from your company – of time, resources and money. The investment required to achieve the vision, and understanding the potential paybacks from it, is a key component to maximizing its value. A clear understanding of the current cost to operate the legacy operations must be understood along with the gaps and the inefficiencies thereof. The vision along with the associated cost savings, efficiency gains and intangible benefits from the new ERP system needs to be evaluated.

This cost versus benefit analysis will enable the company to assess the importance of completing the implementation and justify the on-going investment in it's customers, employees and the company.

Prioritize Your Efforts

Priorities must be established and the business needs of the organization must be understood in order to properly assign them. The project team must also recognize the “wish list” items of the project sponsors. “All these items must be balanced to create an implementation plan that establishes early credibility through meaningful enhancement to the organization while providing a framework for future support and capabilities” as stated by Veinbachs & Wyatt (2000:4).

Understand System Interdependencies

Each ERP system has certain modules that interact in specific ways and integrates with all data from different areas. Applications of the ERP may well affect areas of the system previously implemented. The project team should be aware of these interactions and plan for them so that results can be anticipated. This same rule holds true for modifications as well, as changes made in one area of the system may have an unintended impact upon other transactions or calculations. The key is to know the system and how it operates before jumping in – good preparation will save hours of rework later.

Good external consultants

“External consultants possess a great deal of specialised knowledge about the ERP system and bring along a lot of implementation experience” as stated by Lain (2001:28) Having good external consultants on the project team can help solve technical problems quickly, resulting in shortened implementation time and higher quality results. The experience from these consultants add a lot of value towards a successful ERP implementation.

Integration versus interfacing e the Processes

Another critical element is the integration versus interfacing with other systems to complete the integration process. An ERP, by definition, spans across multiple functional areas of an organization. Prior to ERP implementation, legacy systems had their own different systems and interaction between them and may have been limited or highly reliant on manual intervention. In the ERP world, data elements requirements still exist to get data from old legacy systems if complete ERP functionality requires information from third party products.

In most cases attempts at a best-of-breed, Enterprise Application Integration (EAI) type implementation would fall short of the full business process integration requested by the entities and to some extent this approach would merely duplicate the environment it was meant to replace. A single application vendor could meet the majority of the key business functions, an integrated approach would provide the best solution.

In figure 5 below depicts a comparison between integration and interfacing. Determining how these areas will work together in the future is critical to achieving the desired business results.

Figure 5. Interfacing versus Integration

	Interfaced, Best of Breed	Integrated, single vendor
Business Process Integration	Business Processes are not automatically linked across the entire enterprise and, because interfaces must be custom built, only limited integration is ever achieved. Most interfaces are written in batch mode, so real-time information isn't readily available.	Because data resides in the same common database, the business process is fully integrated, all data is accessible by all authorized users, all users have a common user interface or screen, single sign-on is achieved for all users, and workflows all occur in the same application.
Implementation Risk	The combined risk of all vendors must be taken into account. That is, will all the software vendors deliver the functionality promised? Typically the risk increases significantly that one of the vendors involved will fall short of achieving the timelines and skills necessary for the successful implementation. That shortfall holds back the integration and success of the other vendors.	Risk is generally decreased as the risks can be weighed against the stability of the one application vendor. Skills of the prime contractor can be focused on one application and development environment. Fewer firms are generally involved in the implementation, reducing the risk that weaker players will hamper the success of the team.
Functionality	These applications are generally considered to have a greater depth of functionality.	Although some single-vendor solutions have comparable functionality to the best-of-breed applications, they are generally considered less comprehensive in some areas.
Implementation Cost	Because of their complexity, these implementations are generally more costly and plagued by unforeseen cost overruns.	Although still complex and expensive, these implementations generally cost less and are more likely to come in on budget.
Interfaces	In order to achieve relationships between the various business processes, extensive, expensive custom interfaces must be developed.	The number of interfaces is greatly reduced because the data is largely within the same database.
Infrastructure	Licensing of various types and flavours of servers, databases, development environments, bolt-ons, and operating systems may be required.	Typically one database, with uniform servers and operating systems, is required.

Maintenance Cost	An EAI, best-of-breed approach is significantly higher in its ongoing cost of maintenance.	The long-term Total Cost of Ownership (TCO) is generally much less expensive than a best-of-breed approach.
Interfaces	In addition to the standard personnel cost of maintaining custom interfaces, every time any business processes change, reprogramming of interfaces may be required.	Although some interfaces will exist to external data sources, business process changes are handled through simple configuration changes in the application.
Software	With an increased number of software vendors, typically the cost of software maintenance fees will also increase.	Fewer vendors to pay annual maintenance to with this approach.
Infrastructure	With the diversity of the infrastructure a more diverse skill set is necessary to maintain the environment—driving up personnel cost.	This approach typically requires fewer skill sets and more congruent infrastructure.
Upgrade Complexity and Cost	With each upgrade every interface and compatibility with every interfaced system must be tested. Generally these upgrades are much more complex and expensive.	Upgrades are far less complex unless major changes to the functionality have occurred.

Source: TUI Consulting (Not dated)

While an end view of the integrated processes is critical, the project team must also develop, test and implement incremental process changes to effectively meet business needs . “All affected stakeholders should be involved in the process to secure commitment to the new operational model” as stated by Veinbachs & Wyatt (2000:5).

There are essentially two approaches to achieve this which are attempting to integrate “best-of-breed” applications across the entire system landscape with the various Enterprise Application Integration (EAI) packages; or leveraging the functionality of one fully integrated application from a single vendor. It is this second option that is known as ERP.

5. CONCLUSION

The information in this chapter is very important and outlines the very important steps of an ERP system implementation. Control needs to be seized during every

step during the implementation. Control of what has become the single most powerful resource during the implementation, the control of accurate information from across the enterprise lies at the heart of project management that needs to control the activities and keep a watchful eye on the above mentioned steps.

The success of those systems is predicated on the integrity of the data that goes into them. The rewards are manifold and the integrity of the business and the implementation partner increase significantly. The customer can look forward to more productivity, enhanced customer satisfaction and greater profitability after the successful rollout of the system.

For executives making decisions about these entities, the mandate must be clear, align your project management with your ERP implementation decisions proactively.

No implementation can take place without the basic considerations of project management and the elements thereof. In the next chapter more important elements which are considered part of the project management will be discussed.

In the next chapter (chapter 3) a detailed discussion will follow on other important tools and factors that influence the project management approach. Project management as a discipline and over the past years a considerable amount of knowledge has been built up around project management tools, skills and techniques. Project management is crucial but there are other areas that totally integrates with the project management methodology and that can be considered of equally importance.

CHAPTER 3
PROJECT MANAGEMENT AND THE ELEMENTS OF
SUCCESS

CONTENTS

	<u>Page</u>
1. INTRODUCTION	50
2. PROJECT MANAGEMENT ELEMENTS	51
2.1 Project Management Approach	53
2.2 Resource Management Approach	55
2.3 Scope Management Approach	57
2.4 Training Approach	59
2.5 Risk Management Approach	61
3. CHANGE MANAGEMENT APPROACH	62
4. PROJECT DELIVERABLES	65
5. CONCLUSION	67

1. INTRODUCTION

It's human nature to begin a project with dreams of success. With an implementation, project teams plan that each step taken will be successful, each attained goal building on preceding successful steps. This is all part of the total equation of a working system that is controlled by project management.

“... a project is “a complex, nonroutine, one-time effort limited by time, budget, resources and performance specifications designed to meet customer needs” as stated by Gray & Larson (2000:4). Successful delivery of an ERP system implementation requires a variety of skills and experience. These range from the overall project management and other industry experience through to detailed and specific knowledge of the technical environment being used to implement the applications.

There are various steps and elements that form part of this very important concept, which no implementation can survive without. “To have a good project management methodology covers all the things a project manager needs to do regardless of whether it is a software development, package selection, or relocation of his department project”.

According to Turbit (2003:1) PMBOK (Project Management Book of Knowledge – the Project Management Institute (PMI bible) covers nine areas of project management.

They are:

- Cost Management
- Risk Management
- Scope Management
- Resource Management
- Communications Management
- Quality Management
- Time Management
- Procurement Management
- Integration Management

Managing software projects is difficult under the best circumstances. Unfortunately, many new project managers receive virtually no job training. Sometimes you must rely on coaching and survival tips from people who have already done their tour of duty in the project management trenches. "A project management methodology says projects should be broken down into phases and there should be a plan in place before each phase begins. An application development methodology says what the phases are, and what activities should be undertaken in each phase" as stated by Wiegers (1999:1).

2. Project Management Elements

Projects are full of uncertainty. As project people living in that environment, they grow to accept it. Perhaps it is the type of people who are attracted to projects, or perhaps it is the years of conditioning that makes people want to continue to work in a project environment. Generally speaking less certainty is accepted in a project existence than in a normal on-going business existence.

Someone coming from a line management role is likely to spend their working hours strive for certainty. They want certainty about work input and output, roles, authority levels, and how to handle every situation that will arise. The major difference is that in a normal business department, every situation that will arise is much more predictable than in a project.

Regular project management reviews by senior executives should prevent terms of reference drift, as well as control project quality, cost and time-scales.

According to Thacker (2002:5) the tools and techniques of reviewing project scope and business process re-engineering include:

- Purpose analysis (To identify the objectives.) (See "Focused Improvement Systems")
- Flowcharting (To identify current or future information, material, or document flows)
- Waste analysis (To identify waste in the current process)
- Ownership Analysis (To identify changes of ownership of material, information or documents during their life)

- Benchmarking (To identify alternative strategies, organisation, processes, procedures and methods)
- Resource Domination Analysis (To identify what products or services consume what resources)
- Product life cycle analysis (To identify whether investment in particular products and processes are worthwhile)
- Force field analysis (To identify cultural constraints)
- Pareto Analysis (To sort the wheat from the chaff, in products, processes, value, space utilisation etc.)
- Segmentation (A method of virtually or actually segmenting the business or processes)
- Input / Process / Output diagrams (A method of defining a process)
- Control Systems Design (A method of identifying appropriate control systems techniques for the new situation)
- Measures of Performance Design (A method of identifying how the new process will be measured.) (See Focused Improvement Systems)
- Culture Development (A method of identifying cultural development needs)
- Supplier development (A method of identifying and developing a suppliers ability to support the redesigned process)
- Postponement and Mass Customisation (A method of improving flexibility, and reducing lead times)
- Impact / Ease Analysis (A method of identifying the appropriate things to develop and how to control their development)
- Risk analysis, SWOT, and FMEA (Methods of identifying which aspects of the process or development are risky and which need close monitoring or preventative measures to avoid problems)
- Simulation (A method of testing the new design prior to implementation)

2.1 Project Management Approach

Project Management Book of Knowledge (PMBOK 2000:6) describes project management as the “application of knowledge, skills, tools and techniques to a broad range of activities in order to meet the requirements of a particular project”.

The key features of a project management managing a project are outlined by TUI Consulting (Not Dated:9):

- Experienced project directors and managers must be submitted to the project. This experience will enable realistic plans, appropriate resources and the project strategies to be adopted.
- Clear, attainable project goals need to be outlined from the outset. A clear strategy and project plan with well-defined objectives and outcomes will help keep the project team focused and on track.
- Deliverables based contract will be concluded. The project manager’s responsibility is not only to demonstrate confidence in the ability to deliver solutions, but also ensures that structured project disciplines are in place to produce the desired project outcomes.
- Mutually agreed and well defined scope is essential; therefore the need for structured processes for the control and maintenance of project scope.
- The project manager will lead the change initiative with assistance from the change management team.

The project manager gets his assistance from the management team and the complete his work by relying on a number of sources, which includes the client’s resources. “Project management does not operate in a vacuum. Working closely with the chief executive officer and key managers of the company helps the implementation team understand the scope, needs and expectations of stakeholders, and is therefore critical to ERP project success” stated by Lian (2001:17).

Any large project is as much an exercise in risk aversion as it is in task accomplishment. Successful project managers anticipate what can go wrong. While they cannot identify every possible misstep, spotting just a few reduces the risk of complete failure.

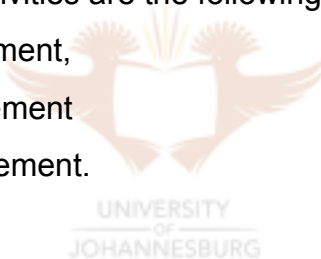
Web (1998:5) states that there are 12 important steps to risk reduction (Uncertainty management here is a must).

- Don't do things for the wrong reason - Identify the benefits that will result from your project, and then make sure every project-related action is directed toward achieving those benefits.
- Own the project - All managers own the project. They will be credited for its success, or blamed for its failure.
- Failure is not an option - No one should believe that the project will be terminated.
- Warn off the disbelievers – If successful results are truly important to your company. Remove those who won't support the project, or if that's not possible, make their future success with the company dependent on the system's success.
- Cast implementation details in concrete - Set believable dates and do not change them.
- Keep the project under control - The longer and larger a project, the greater the likelihood of failure. Nine months is usually the extent of management's attention for any implementation effort.
- Designate a single leader - Shared leadership is divided leadership.
- Don't demonize your vendor – Never use your software vendor as a scapegoat. You will need his goodwill as well as his technical support for the long-range success.
- Keep functional managers accountable - An ERP implementation is not merely a "computer project," it is a strategic business project and must be approached as such.

- Make business objectives the primary drivers of the project - Investing in technology for the sake of technology does little more than drain company assets.
- Don't let technology jargon intimidate system users - When system users do not understand what is being explained about the system, they will lose their enthusiasm for making the system work.
- Do not over-modify - Perfectionists try to customize the system down to the smallest detail, do not let that happen.
- To keep the project in-hand - periodically reassess where it stands, especially in regards, to potential problems. Also verify that the project team's attention is focused on the right goals.

Lian (2001:14) comments that out of the 1027 IT projects surveyed, only 130, or 12.7% were completed successfully. The top 3 reasons cited for failure with respect to management activities are the following:

- poor scope management,
- poor project management
- poor change management.



2.2 Resource Methodology Approach

The Project Team will identify the client users that will be required to support the project during development. According to Adam et al. (Not Dated:11) the human resource aspect in an ERP implementation is a major undertaking, which requires management to assemble the best possible team to plan, execute and control the project.

The users will support the project on a “block release” basis whereby the users will be assigned to the project on a needs basis. As a general rule our client users will not be assigned on a full-time basis to the project unless it is critical to the successful implementation of the project or if the general manager of the relevant business unit releases the user resources to the project.

The project resourcing strategy is consistent with and supports the project approach. According to TUI Consulting (Not Dated:11) all the different teams will have a team leader who in addition to working on project activities will be responsible for the following activities:

- ♣ Reporting progress against schedule and milestones to project manager
- ♣ Raising issues and risks to project manager
- ♣ Highlighting training needs of team members
- ♣ Managing tasks within team to ensure completion to budget (anticipated productivity rates) and schedules
- ♣ Undertaking regular performance reviews of project team members

Assisting the QA team in the assessment of actual deliverables to targeted deliverables and quality of output meeting structures. It will follow project control and reporting meeting structures. There are several documents that needs to be included in the reporting pack:

- ♣ Functional stream status reports - this must include current status against target milestones / deliverables, issues creating project risks, budgeted work effort days versus actuals and review of next week's deliverables.
- ♣ Project issues log.
- ♣ Minutes of last meeting and progress on action items.

The team leader, planning and management will be responsible for putting together the reporting pack for this meeting. The reporting pack must be delivered to the Project Director with a summary of the key issues arising out of the team leaders meeting.

The Project Manager will produce a progress against plan report. This report will be distributed to the Project Director.

- ♣ Progress against schedule for all activities in progress
- ♣ Progress against budget for all activities in progress

- ♣ Progress to date figures for activities in progress
- ♣ Issues, problems and risks which may affect the completion of the project according to budget or schedule
- ♣ Resource levels and requirements

The success of the project requires open communication channels between the development team and the business users and management team. The delivered solution must include the functionality determined in conjunction with the business, with any variations discussed and approved by the management team.

Shanks et al. (2003:319) also suggest another comprehensive lifecycle model that was developed by Sandoe with proposed phases such as initiation, planning, analysis with process design, realisation, transition and operation. The Project Manager will escalate issues and risks where appropriate to the Project Director. The Project Director will be responsible for the resolution of these issues risks with the assistance of general managers and other stakeholders.

2.3 Scope Management Approach

Scope management is to ensure that a common and shared view of the scope is reached prior to concluding contract negotiation. Managers will agree and implement a schedules specifying tasks, deliverables and functionality requirements.

Before the project commences a scope statement and the rules on how scope changes will be handled needs to be addressed. The scope gets defined upfront and the modules or areas to be implemented as part of the ERP system solution usually gets mapped out. After the blue print phase and the business process re-engineering has been completed and the system has been fully mapped the scope gets concluded. According to Riordan (2001:1) “Proper scope management is critical to the success of any project, especially in terms of time and money”.

Part of the project management approach includes one of the first tasks of any project manager to develop a written scope statement. Riordan (2001:1) gives three important reasons for the development of a scope statement:

- Forms the basis for agreement between customer and supplier
- Will be the basis for all project related decisions
- Will be used to determine whether the project has been completed.

In relation to the knowledge areas in the PMI, PMBOK, developing the scope statement is included in and the most important output from the scope planning process. The written scope statement identifies both the project deliverables and project objectives. It provides a basis for confirming or developing common understanding of project scope among the stakeholders. A clear scope understanding is required for a successful implementation before the project has even started.

The scope statement should include the following information:

1. Strategy: An overview of the customer's business needs in relation to the project and the business need the project was undertaken to address.
2. Product of the project: A summary of the project deliverables.
3. Project Objectives: Quantifiable goals in terms of time, money and technical quality that the project must achieve to be considered successful.
4. Supporting detail: Description of all assumptions and constraints considered during the development of the scope statement.
5. Scope Management Plan: A description of how the project scope will be managed and how agreed changes will be incorporated into the project deliverables. There is usually a separate document describing the change control process and a cross reference to that document should be included in the scope management plan as stated by Riordan (2001:3).

These schedules will be attached to the project contract and become the primary scope control. If, subsequently, on sign-off of the Business Blueprint phase. There are variations to the previously defined scope, such changes will be reviewed and mutually agreed for any resulting impact of changes on the primary

scope document defined in the contract schedule(s). The agreed Business Blueprint then becomes the primary project scope control.

We've all heard of the dangers of "scope creep" – that mysterious element that somehow grabs hold of ERP implementation projects and details them as more and more elements are added to the implementation. We know we need to manage the implementation closely to prevent unwieldy project expansion from happening. This danger is managed with the scope management approach of the project management methodology.

2.4 Training Approach

One of the key objectives, in our view, is to ensure that knowledge transfer to the customers staff to ensure that they are able to support the solution after go live. All project team members and designated our client users, will complete the appropriate training required to complete their assigned task. Specific training requirements will be finalised pending selection of development tools and technical systems.

The project team leaders to ensure that new team members are aware of team standards will facilitate on the job training. This will be facilitated by a project orientation pack, containing key information such as project scope, market background, organisation structure and contact numbers. Training and revision of standards will occur as required and be the responsibility of team leaders.

The most apparent similarities and evident differences will be addressed to understand the phases and lifecycle during the implementation of an ERP system. Critical analysis of information systems development methods (ISDMs) has been a research study that has been conducted for many years. ERP systems implementation methods "... are mostly developed by ERP vendors and ERP consulting firms to support the implementation of ERP systems (Markus & Tanis 2000).

According to TUI Consulting (Not Dated:23) a good training philosophy is based upon the following guiding principles:

- People learn when they are presented with information in a time and place that is relevant to their current needs;
- People make sense of new situations by applying previous experience and lessons learned from similar scenarios so this prior information should be accessible as they encounter new situations; and
- People internalize new knowledge when they must use it to help themselves attain a goal they are motivated to reach so learning and performance support needs to be aligned to job performance requirements.

In figure 6 below indicates that training should be based on three very important elements:

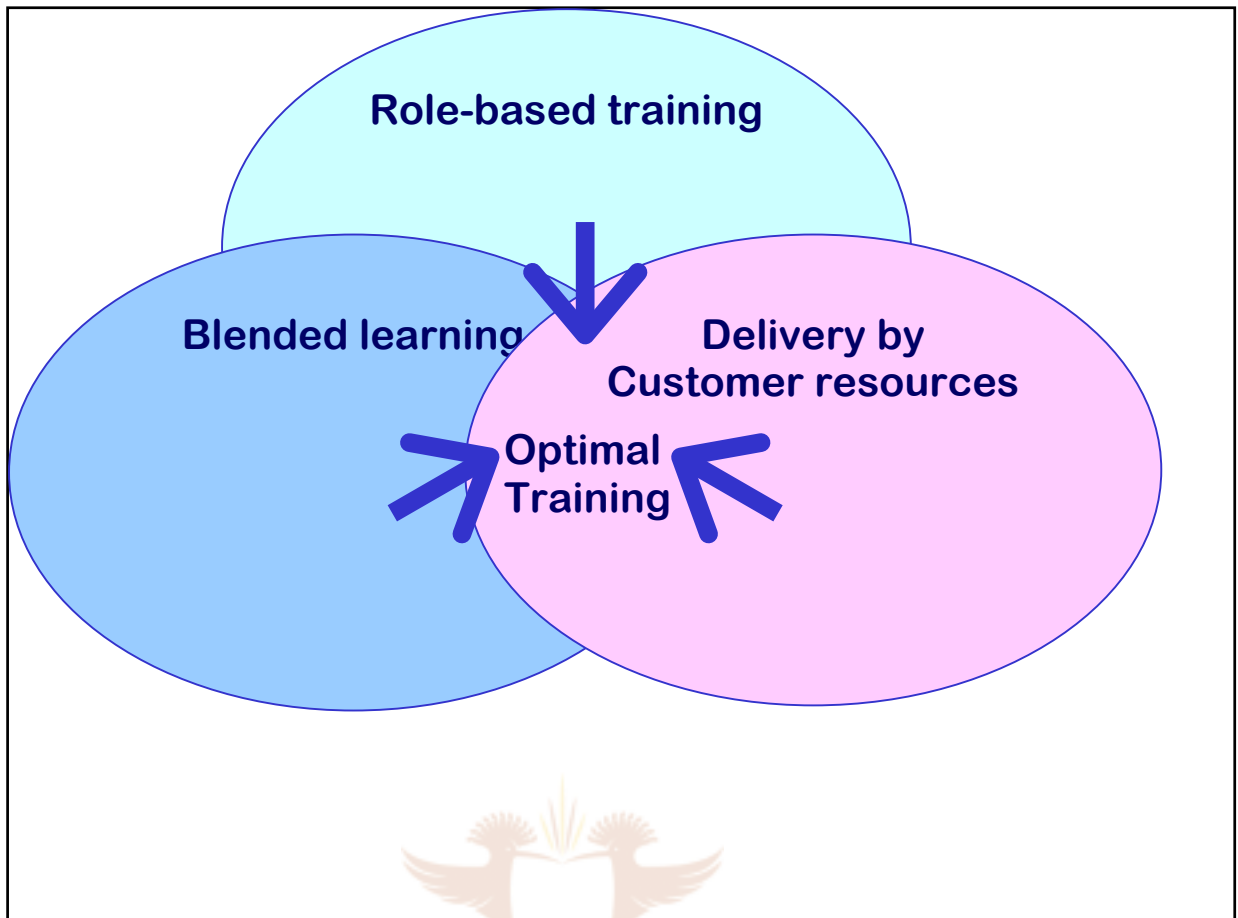
1. Role based training – All user and employees that would be using the new system would be required to be trained in there new roles and specific tasks that they will be performing after the ERP system has been completed.

2. Blended Learning – Refers to the different types of learning that can be used to train the users. Class rooms, more visual training approach or even one on one training. Different people have different methods of learning, some people might be more visual and some people might need more practical exerises to understand better.

3. Training delivery by customer resources – when the training gets delivered by the resources from the client, the users that are being trained have more in common with the trainners and the leanining processes is being seen as easier.

The combination of the above elements indicates the optimal training point which gets achieved. Figure 6 below indicates the above discussion on the optimal training that can be offered to users with the implemenatation of ERP systems.

Figure 6. Optimal Training Blend



Source: TUI Consulting (2004)

2.5 Risks Management Approach

Issues and risks will be identified and reported, monitored and controlled, actioned and resolved where possible in the team leaders' meeting. The weekly progress report will record all key dependencies and issues which may potentially impact on the successful completion of the project.

All members of the team and customers are able to register any issue. Issues and risks may be raised directly with the Project Manager, either verbally or in writing. The customers learn more about the ERP systems capabilities as time pass and request functionality that might put the project at risk at late stages in the project. That can also be considered risks and those issues needs to be reported and handled with the correct processes, and forwarded to the steering committee for resolution.

3 CHANGE MANAGEMENT CONTROL

“Change control procedures are the mechanism whereby prospective change in any baseline document is passed through a formal assessment and authorisation process” (TUI Consulting 2003): The change control system will allow flexibility to adapt the project to meet the needs of the changing business environment, whilst still retaining control over costs and timeframes.

Change control will become effective when the baseline for the project becomes established. “Updating the Plan” The plan will be updated regularly throughout the various phases of the project. It will be reviewed at the end of each major activity or every three months, whichever occurs first. Successive issues of the plan will then be produced.

“... a project sponsor is assigned the direct responsibility for the Enterprise systems (ES) progress and often is responsible to secure funding . The project sponser is directly accountable for the project” as stated by Shanks et al. (2003:140).

Turbit (2003:3) describes a discussion with a sponsor of a multi-million dollar project as follow: *“I saw the project slipping away. We were getting bogged down in detail and developing functionality that I thought was not needed. Fortunately, after asking you to look at the situation, you told me the critical point I was missing.*

You asked me was I happy with progress. I said no. You then said to me that I was in control, so what was I doing? It had never occurred to me that I was actually at the helm. The penny dropped. You had reminded me that regardless of all the techno-babble, I was signing the bills. It was time to make myself comfortable with the progress regardless of how dumb the questions might seem to some technical guru.

I called the team together and told them where I saw they were drifting away from the direction we had set. We discussed it and to my surprise they agreed. They were as lost as I had felt. We stopped, reviewed where we were going, and changed course. After that, I felt more like a manager than an unwilling

passenger. The project team started talking to me more about what was happening, and we suddenly started making progress”.

The change management team need to have a clear understanding of the organization and people issues to improve the probability of success. The change management team need to assess people’s willingness to accept the new system and to adopt to the change in the possible business areas. The change management team need to be committed to assist the customer with a successful transformation, which is defined by the long-term, sustainable benefits that can be realized.

According to TUI Consulting (Not Dated:35) “... a high level, change resistance manifests itself in the following categories:

- Not Willing: Understanding change resistance early can turn some of the biggest critics into the biggest advocates
- Not Able: Employees need to know how to carry out major processes, use the system and build new business skills
- Not Knowing: Communications must be enabled to build awareness, buy-in and ownership

It is crucial that the vision for the project is well articulated, interpreted & shared by key leaders. When the key leaders of a company are fully supporting the new ERP system implementation the employees in these business units support their management staff and the accepting the new information technology system becomes easier. Effectively communicating the vision mandating change will help spur initial movement forward. This needs to followed up on by a strategic, actionable vision, disseminated by leadership.

The management staff and the stakeholders in a company need to bring an integrated team to the table that can actively participate in bringing the voice of the user and add to the success of the project. Effective communication increases awareness and involvement in the project.

The success of any project is directly linked to the training strategy and activities.

Employees must be equipped with the knowledge and skills to be effective in their jobs on day one, therefore the importance of training delivery. An analysis of what motivates and concerns the users need to be made and the change management plan needs to be addressed accordingly. The implementation partner needs to bring implementation, business and change skills to the project to ensure the workforce fully understand, holistically, how job roles will be impacted through not just the new ERP system tools, but also the new processes and associated competencies required for success.

TUI Consulting (Not dated:34) describes their change management approach as being people-focused and tailored for a total transformation. “ Our approach may be characterized by the following:

- Action-oriented, not theory-oriented;
- Flexible, not rigid application of methodology;
- Focus on gaining stakeholder acceptance, not changing the corporate culture;
- Drives behavior changes by managing performance not evaluating performance.

Change management is so critical, that an special formulated integrated team needs to manage the “people” component of the engagement. The key to change management is to engage the stakeholders and enable the workforce It is crucial that the vision for the project is well articulated, interpreted & shared by key leaders. Effectively communicating the vision mandating change will help spur initial movement forward. This needs to followed up on by a strategic, actionable vision, disseminated by leadership.

An integrated team should actively participate in bringing the voice of the user. Effective communication increases awareness and involvement in the project. The success of any project is directly linked to the training strategy and activities. Employees must be equipped with the knowledge and skills to be effective in their jobs on day one. The integarted change management team needs to understand what motivates and concerns the users.

It is sometimes hard for the sponsor to take control when it all seems a technical minefield. The project manager needs to reinforce with the sponsor that they are ultimately responsible for the success of the project. Fitz-Gerald & Carroll (2003:7) states that top management refers to executive level support, this may be indicated by “the level of commitment by senior management to the project in terms of their own involvement and willingness to allocate valuable organisational resources” and to a willingness and ability to undertake the cultural, political and structural change which may be necessary for successful ERP system implementation. The role of a project champion or executive sponsor is to provide strategic input for the project team and to market the benefits of the project back to the business. This will make the change management initiative much more acceptable and the business people will accept with less resistance.

4 PROJECT DELIVERABLES

This section sets out the organisation and responsibilities of the Project Team. This section summarises the deliverables that will be produced during the project.

According to Turbit (2003:4) “the objectives for the project should be measurable. It is a given that the first key objective is to achieve the outcome however objectives can also relate to the management of the project”. There should be a clear differentiation between business objective and project objectives. Turbit (2003:5) gives a set of examples that clearly defines between the project and the business. They are:

Business Objectives Examples:

- Reduce examples of reported duplicate contact from an average of 10 per day
- Reduce customer complaints related to communication from 20 per week to 5 to 2 per day within 3 months of implementation.
- Improve sales to 60% of existing customers by an average of 15% over 12 months beginning 2 months after the project.

Project Objectives Examples

- Deliver the project within budget

- Deliver at least 85% of functionality in the first release
- Complete the first release by end December
- Ensure all deliverables are quality certified by out QA department

Activity Deliverables include the following deliverables:

- ♣ Process documentation on how to complete activity
- ♣ Documentation for each reviewable stage of the activity to demonstrate adherence to standards and enable third party reviewers to understand the results of the activity
- ♣ Log of all work to be completed for the activity
- ♣ Reports to be produced weekly from activity log which indicate progress to date

All activity deliverables will form part of the achievable project records. Each team leader will be responsible for the activity deliverables for the activity they are responsible for. Overall responsibility for all activity deliverables resides with the Project Manager.

A Project Control Log needs to be established and maintained by the Project Manager:

- Project Definition Report
- Project Execution Plan
- Weekly Progress against Plan reports
- Weekly financial reports on actual spend to date and forecasted spend
- Variation requests against each issue of Project Execution Plan
- Weekly progress to date figures generated from activity log records
- Activity completion records
- Contract status and review points
- Resource numbers

The financial section sets out the monitoring and change control mechanisms to be used for the project costs. The Project Manager will carry out regular monitoring and tracking of costs. These will be recorded by Excel spreadsheets for labour and expenditure and MEL accounting systems (with the assistance of IS Accountant) for non labour costs.

For both labour and non labour costs the following will be monitored and tracked:

- ♣ The project budget amount
- ♣ The expected cost rate versus the actual cost rate
- ♣ Forecast expectations

Quality Assurance Reviews

Quality Assurance reviews will be the responsibility of the QA and Process Manager who will define the criteria to be checked and conduct the reviews to ensure compliance to defined standards. Reviews will be repeated periodically to provide feedback on the effectiveness of new or revised standards implemented since the last review.

The reviews may recommend any of the following actions:

- ♣ revision of process
- ♣ wider or repeat communication of process
- ♣ individual or whole team training needs
- ♣ revision of assumptions

Quality Assurance reviews will also be conducted by independent reviewers on a periodic basis. These reviews may take the form of question and answer sessions of team members or review of outputs to ensure compliance to defined project process and standards.

5. CONCLUSIONS

Projects are full of uncertainty. As project people living in that environment, we have grown to accept it. Perhaps it is the type of people who are attracted to

projects, or perhaps it is the years of conditioning. Generally speaking we accept less certainty in our project existence than in a normal on-going business existence. Someone coming from a line management role is likely to spend their working hours strive for certainty. They want certainty about work input and output, roles, authority levels, and how to handle every situation that will arise.

The major difference is that in a normal business department, every situation that will arise is much more predictable than in a project. There is a significantly higher level of repeatability and hence predictability. In a project, our view into the future is much less clear than in an ongoing business role. The reason is that we are creating the future as we go. We are not travelling down a path travelled many times and created long ago. It is uncomfortable for some business people to both accept the level of uncertainty and then live with it.

Looking at it from the other person's point of view could solve many of the problems between business and IT. Empathy is a wonderful tool for solving conflict. If you think where a business person is coming from, and talk to them about their perspective, it can only help.

The importance of a project elements and the existence of a successful implementation without project management can clearly be realised.

In the next chapter to follow, chapter 4, the assessment of benefits and successes which has been realised with ERP implementation would be discussed. There will be several case studies that would be referred to and the advantages and benefits of their successes would be highlighted.

CHAPTER 4
ASSESSMENT OF BENEFITS AND SUCCESSES
OF ERP SYSTEMS

CONTENTS

	<u>Page</u>
1. INTRODUCTION	70
2. MEASUREMENT OF SUCCESS	
2.1 Operational Assessment	71
2.2 Managerial Assessment	74
2.3 Strategic Assessment	75
2.4 Information Technology Assessment	75
2.5 Organizational Assessment	76
3. BENEFITS OF ERP SYSTEMS	77
4. CASE STUDIES OF SUCCESSFUL ERP IMPLEMENTATIONS	
4.1 China Telecoms success story	79
4.2 NamITech a South African Success Story	84
4.3 City of Cape Town Success Story	87
5. CONCLUSION	89

1. INTRODUCTION

Particular attention to assessment of ERP system would be discussed. "Successes depend on the *point of view* from which you measure it" (Shanks et al. 2003:24). This chapter proposes that the assessment of ERP implementations can be assessed from different view points. Certain aspects of the project that might be important to some might not have the same level of importance to other.

Shanks et al. (2003:24) state that "...the assessment of different dimensions that include:

- Success viewed in technical terms
- Success viewed in economical, financial or strategic business terms
- Success viewed in terms of smooth running of business operations
- Success viewed by ERP- adoption by the managers and employees
- Success viewed by ERP-adopting organizations customers, suppliers, and investors.

Other fundamental factor that needs to be considered during the determination of the success has to do with timing of assessment. An ERP implementation can be considered being successful after the systems has gone live or months after the implementation has been completed and its performance can be measured against the previous legacy systems. According to Shanks et al. (2003:24) the organizations that adopt ERP systems need to be concerned with success not just at the point of adoption, but also farther down the road".

Lain (2001:5) indicates that there are two ways in which a project can be classified as being successful, firstly according to considered implementation successful if it meets the initial project requirements for going live, such as meeting deadlines, staying within budget and achieving system performance as expected.

Lain (2001:6) also indicates that the ultimate definition of a successful ERP implementation is the cost effective integration of complete business processes using information technologies. Companies satisfied with their ERP software often list dozens of productivity enhancements, including process automation,

improved efficiency, tighter integration, as well as elimination of bottlenecks and duplicative procedures.

There are few companies that can answer yes to all of these questions, knowing how companies deal with each and the emphasis that is placed on each element of success is important to the specific project.

Shanks et al. (2003:25) also indicate that there are three distinct phases when success can be measured, they are

1. The *project phase* when the software has been configured and is rolled out to the organization.
2. The *shakedown phase* where the company goes from 'go live' to normal operations.
3. The *onward and upward phase* where the company captures the majority of business benefits and plans the next steps for technology implementation and business improvement.

The above discussions indicate that success can be measured during different stages. Further discussions will follow that would determine when a project can be considered being successful by assessing the areas discussed below.

According to Esteves et al. (2002:11) the optimal success refers "to the best outcomes the organization could possibly achieve with enterprise systems, given its business situation, measured against a portfolio of project, early operational, and longer term business results metrics".

2. MEASUREMENT OF SUCCESS

2.1 Operational Assessment

After the legacy systems has been replaced and the new ERP system has been implemented, configured and rolled out to the business, and the project is in its "project phase" described by Shanks et al. (2003:25) as the phase where the configuration has been completed and rolled out to the business, the very first assessment can be completed from an operation perspective. Shanks et al. (2003:78) describe that information technology has a history of cutting cost and raising outputs by automating basic repetitive operations.

According to Shanks et al. (2003:79) "...expect enterprise systems to offer benefits in terms of cost reduction, cycle time reduction, productivity improvement, quality improvement and improved customer services".

The necessity of realigning organization and processes with the implementation of an integrated ERP-system, a subject over which many management consultants have argued for at least a decade. "This aspect turns out to be the main success factor after all" according to Wall et al. (Not Dated:3). They continue by adding another important factor – "the acceptance by employees" – sometimes mentioned as "one" among others – seems to be not only one important, but the sole important factor for the success of an ERP-system.

According to SAP AG (1999:2) they offer their customers the following operational benefits that can be achieved:

- Convert time-consuming, manual steps into streamlined, online processes to improve overall enterprise planning.
- Support the planning and deployment of assets, manage assets over their complete life cycle, and reduce order cycle times and excess inventories.
- Streamline processes at warehouses and distribution facilities.
- Manage transportation and distribution efficiently.
- Extend collaboration with both customers and suppliers.
- Enable a collaborative project management environment that includes external parties to manage both simple and complex projects.
- Provide personalized interfaces, portals, mobile applications, and tools that enable employees to do their jobs more effectively.
- Enable enterprise wide visibility, forecasting, and performance management -- reducing planning cycles and lead times, and enabling continuous process improvements and faster response to new opportunities.
- Improve customer service and respond quickly to customer demand.

Cost reduction can be achieved by various aspects. The business process re-engineering process remove redundant and excess processes and reduces the number of staff that deals with these business processes. The capturing of assets and the depreciation thereof can be recorded more accurately and the maintenance can be done on a more precise manner. This saves the company a lot of money where preventative maintenance can be done and save the company a lot of money.

During the ordering process more up-to-date warehousing levels can be maintained and strategies like the Just-in-Time (JIT) concept can be handled more accurately. Special arrangements can be made with suppliers and better discounts can be negotiated.

Administrative expenses can also be reduced significantly. The paperless office environment idea is much more achievable with ERP systems that integrate with scanning programs. More efficiency is achieved where documents get send internally and faster processing of tasks is done. The workflow used in ERP systems ensure that financial documents and other documents that require further processing are send internally and paperless for approval.

Anomelechi-Onyeodin (2004:4) indicates the following operational benefits that can be achieved with an ERP implementation by the different vendors listed:

- Cycle time reduction - Autodesk
- Faster information transactions - IBM
- Better financial management - Microsoft
- The groundwork for electronic commerce - Cisco Systems
- Harnessing and managing processes and existing knowledge - Monsanto

According to Rockford Consulting (2004:3) "...the key causes of ERP implementation failure is ill-advised cost cutting". In an effort to avoid temporary conversion costs, some companies take a very risky route and go live at multi-plant sites simultaneously. Attempt to unrealistically compress the schedule in order to save on expenses, only to eventually overrun both schedule and budget. Return on Investments (ROI) should take a "back seat" when upgrading an important part of a company's infrastructure. Implementation should be

treated as an upgrade necessary to maintain or gain a strategic and competitive advantage” as stated by Hitt et al. (Not Dated:2).

2.2 Managerial Assessment

“The ability of ERP systems to disseminate timely and accurate information also enables improved managerial and worker decision-making. Managers can make decisions based on current data, while individual workers can have greater access to information, enabling increasing delegation of authority for production decisions as well as improved communications to customers” Hit et al. (Not Dated:3).

Shanks et al. (2003:98) list the following managerial benefits that can be achieved by ERP implementations:

1. Better Resource Management

- Better asset management for improving cost, depreciation, relocation physical inventory and maintenance record control.
- Better inventory management for improving inventory turns, stock allocation quick and accurate inventory information.
- Better production management for optimizing supply chain and production schedule.
- Better workforce management for improved manpower allocation and better utilization of skills and experience.

2. Better Decision Making

- Improved strategic decisions for improved market responsiveness, better profits, cost control and strategic planning.
- Improved operational decisions for flexible resource management, efficient processes and quick response for changes.
- Improved customer decisions with flexible customer services.

3. Better Performance Control

- In various levels of the organization this can be achieved.
- Financial performance by lines of business, by product, by customers, by geographics or by different combinations.

- Manufacturing performance monitoring by prediction and quick adjustments.
- Overall operational efficiency and effectiveness management.

2.3 Strategic Benefits

Shanks et al. (2003:99) list the following strategic benefits that can be achieved by ERP implementations:

1. Support current and future business growth plan
 - Business growth in transaction volume, processing capacity and capability
 - Business growth with new business products
 - Business growth in new markets
 - Business growth with rapid industry changes
2. Supporting business alliances
3. Building business innovations by creating new business and new supply chains
4. Building cost leadership with economies of scale
5. Generate and enhance product differentiation
6. Building external linkage with suppliers, distributors and related business parties
7. Enabling worldwide expansions
8. Enabling e-business provide benefits from business to business and business to individual with interactive customer services.

2.4 Information Infrastructure Benefits

The benefits arising from the stability of a standardized database platform and the flexibility of the system are likely to only realize the benefits and the cost reductions after the implementation. “A stable and well understood platform will be attained during the implementation phase. During the implementation phase organizations may focus on getting the system running normally, before looking at expanding to external parties or adding applications. So, some of the IT

benefits are unlikely to arise until the post-implementation phase...” as stated by O’Grady (2002:3).

Shanks et al. (2003:100) list the following infrastructural benefits that can be achieved by ERP implementations:

1. Increased business functionality by responding to internal and external changes
2. Information Technology cost reduction by the following:
 - Legacy system integration and maintenance
 - No mainframe and hardware replacement
 - IT expenses for staff to developing and maintaining the system
 - Minimal system modifications and maintenance
 - Increased Information technology infrastructure and capability which is more stable and flexible.

The infrastructure benefits includes the benefits that arise from the systems ability to support business growth – through its ability to expand the infrastructure to add new products, lines of business, newly acquired businesses, and to accommodate increases in transaction volume and employee numbers. The infrastructure benefits support the strategic benefits of the company.

2.5 Organisational Benefits

Shanks et al. (2003:101) list the following organisational benefits that can be achieved by ERP implementations:

1. Business organisational changes in the structure and processes
2. Facilitate business learning and broaden employee skills
3. Empowerment by more accountability and value adding responsibility
4. Changed culture with common vision
5. Better employee morale and satisfaction with better system performance and better employee self service.

ERP benefits are motivations for implementing the system and the point in time at which organizational benefits are assessed. The benefits of ERP systems implementation should be assessed in relation to the organization's unique goals for the system and those should be outlined before the project starts and measured against these goals as stated by O'Grady (2002:4).

3. COMMON BENEFITS OF ERP SYSTEMS

Enterprise Resource Planning systems had an electrifying influence on the global economy and on information technology in general. The single most important benefit that could have been achieved with ERP systems is the integration that gets achieved on different levels in a corporation.

According to Wall et al. (Not Dated:2) ERP systems are expected to lead to several benefits as for example:

- Rationalization e.g. due to reduction of data entering tasks
- Acceleration of business processes, e.g. due to enterprise wide data flows
- Increase of decision quality due to better information, e.g. with respect to quantity, correctness or consistency.

After an ERP system has been implemented the benefits and other general benefits is not realized immediately. Business is slower than normal directly after the legacy system has been deactivated and the "go live" phase has taken place. Several aspects may be the cause of this, for example data issues, training issues, change management issues and the overall transition from the legacy system to the ERP system.

ERP implementations are also known to be unusually difficult to implement, even when compared to other large-scale systems development projects. Part of this difficulty is due to the pervasiveness of the changes associated with ERP, the need for simultaneous process redesign of multiple functional areas within the firm, and the need to adapt processes to the capabilities of the software" as stated by Hitt et al. (Not Dated:2)

According to Hitt et al. (Not Dated:2) "the appeal of the ERP systems is clear, while most organizations typically had software systems that performed much of

the component functions of ERP, the standardized and integrated ERP software environment provides a degree of interoperability that was difficult and expensive to achieve with standalone, custom-built systems. For example, when a salesperson enters an order in the field, the transaction can immediately flow through to other functional areas both within and external to the firm.

The order might trigger an immediate change in production plans, inventory stock levels or employees' schedules, or lead to the automated generation of invoices and credit evaluations for the customer and purchase orders from suppliers". To date, most of the documentation of the benefits of ERP has been in the form of individual case studies

4. CASE STUDIES OF SUCCESSFUL ERP SYSTEM IMPLEMENTATIONS

ERP systems insights from case studies are subsequently used to conceptually define the benefits constructed and derived from post implementation reviews. The construct from antecedent conditions during the implementation process and from potential outcomes, and suggest operational measurements are useful for future empirical investigations.



Nicolaou (2003:1) refer to case studies on ERP systems as "...past research findings that suggest the effectiveness or successes of an information system that depended on a variety of factors, most importantly those relating to the extent of user participation, the extent of business process and needs assessment during the analysis stage and the level of data integration".

According to Hitt et al. (Not Dated:1) most of the documentation of the benefits of ERP has been in the form of individual case studies, product testimonials and industry surveys. Hitt et al. also indicate that their goal for ERP research is to better understand the economics of ERP implementations specifically, and more broadly, contribute to the understanding of the benefits of large-scale systems projects.

A small but growing literature on the impact of ERP systems has been done. The majority of these studies are interviews, cases studies or a collection of case studies and industry surveys performance improvements. These performance improvements included the ability to provide information to customers, reduced cycle times and on-time completion rates (Hitt et al. Not Dated:1)

Gattiker & Goodhue (2000:8) group the literature of ERP benefits into four categories:

1. Improve information flow across sub-units, standardization and integration facilitates communication and better coordination;
2. Enabling centralization of administrative activities such as account payable and payroll;
3. Reduce IS maintenance costs and increase the ability to deploy new IS functionality;
4. ERP may be instrumental in moving a firm away from inefficient business processes and toward accepted best of practice processes

In further discussion a few case studies will be quoted from sources where ERP systems have successfully been implementation and researched.

4.1 China Telecoms Success

This assessment of China Telecoms ERP system implementation has been conducted by an independent interview with Shiping Liang, the director of the application division at China Telecoms. There would be several direct quotes made from Liang. The background of China Telecoms would first be discussed and the benefits, successes and additional achievements. All these benefits and successes will be highlighted in the text. The implementation partner was BearingPoint China, worldwide implementers of ERP solutions.

China Telecom Corporation, the world's largest fixed-line operator, has a vision: to turn the company into a world-class telecom powerhouse within five years. To turn that vision into reality, China Telecom teamed up with SAP and HP to build a state-of-the-art IT landscape. The company took a huge leap forward to gain business insight, achieve organizational efficiency, and increase productivity.

China Telecom was formed as part of the reorganization of the former China Telecommunications Corporation, a state-owned enterprise. Today, China Telecom has over 350,000 employees across China; operates domestic and international fixed-line networks; provides fixed-line voice, data, and information services; and is engaged in international telecom accounts settlement.

Despite the worldwide slowdown in the telecom industry, China Telecom has maintained sustained growth over the last two years, with \$17.6 billion in sales and an 8% increase in 2003. In 2002, China Telecom successfully launched its IPO at the New York Stock Exchange to become the third Chinese telecom company listed on an overseas stock market. China Telecom has undertaken challenging reforms to transform itself from a traditional state enterprise into a customer-focused, profit-driven modern enterprise.

This process has posed that “mySAP ERP can provides us with a single, consolidated, and timely view of our business”. This is a major breakthrough for us. With SAP, we can *make faster decisions* and get *a tighter grip on management control*.”

Key challenges for the implementation were the following:

- Build a state-of-the art IT landscape to support business transformation
- Comply with international reporting rules
- Integrate all major business functions and achieve real-time management

Key benefits of the implementation were the following:

- Scalability and flexibility of mySAP ERP allowed an initial focus on essential
- business needs, enabling fast implementation while maintaining full adaptability
- Comprehensive business insight and analysis, supporting faster decision making and tighter operational control

- Faster information flow enhanced internal collaboration and increased employee productivity

Enormous challenge to IT within the company and as a publicly traded company, China Telecom must comply with international reporting rules. Taking these challenges as an opportunity, China Telecom decided to build a new IT platform with cutting-edge technology and based on best practices. They set an ultimate goal for this initiative:

- The new environment needed to help the company increase organizational efficiency,
- Achieve transparency and real-time management, tighten internal control
- Enhance collaboration between departments. The software had to integrate within and beyond its functions and meet the industry-specific business requirements of a telecom operator.

After careful evaluation of several global ERP vendors, the company chose mySAP™ ERP as the backbone system. “We chose SAP because of its broader range of functionalities and integration capabilities. It is best equipped to deliver solutions for a large enterprise and provides much-needed industry expertise for a telecom business,” says Shiping Liang, director of the application division at China Telecom.

SAP ERP supports several core business processes, including finance, controlling, human capital management, procurement, and engineering project management. To build an enterprise class data-integration platform, China Telecom also chose to leverage the SAP Business Intelligence (SAP BI) and SAP Enterprise Portal (SAP EP) components of SAP NetWeaver.

To ensure maximum Return on Investment (ROI), China Telecom required an infrastructure platform with exceptional reliability, performance, availability, and scalability to power mySAP ERP. Equally important, it needed a flexible solution to allow IT to keep pace with changes while offering a low total cost of ownership. The vendor needed to be able to assemble a broad range of products and

services to cover all of China Telecom's requirements: from PCs to powerful servers, from network storage to customer support.

The company selected HP's HP 9000 server family to support the mission-critical SAP applications. This is a state-of-the-art storage solution that delivers outstanding scalability, availability, reliability, and the highest performance in its class. With SAP ERP and its new HP infrastructure, China Telecom is equipped with one common solution that provides the flexibility to respond to changing and growing business needs. This flexible and adaptive platform plays a critical role in enabling the enterprise to achieve maximum business agility and further enhance its competitiveness.

China Telecom will roll out the complete SAP solution over 2 years at 20-plus subsidiaries. Eventually, the system will have 30,000 users across China. The project is the first large-scale SAP deployment in the telecom industry in China, according to Chris Zhao, senior account manager for SAP China. The countrywide kick off of the SAP project started in parallel in the Beijing, Guangzhou, and Shanghai offices. The solution successfully went live seven months later in all three locations with a total of 1,000 users.

The SAP landscape has been designed to cater to the business needs of each office. At its Beijing headquarters, China Telecom implemented the human capital management functions of SAP ERP and SAP BI to support centralized human resources management and to provide consolidated information to group management. The Guangzhou and Shanghai subsidiaries, which generate most of the company's business, use the financials, operations, human capital management, and analytics capabilities of SAP ERP, plus SAP EP and SAP BI.

SAP ERP and the underlying HP infrastructure so it could make tough decisions and focus on essential business needs while maintaining full adaptability to grow the installation and respond to changing requirements. According to Liang, this was crucial to managing the implementation and achieving faster ROI.

China Telecom has three building blocks for its corporate information strategy:

- The management supporting system (MSS) to support back-office activities
- The business supporting system (BSS) to manage customer relationships,
- The operational supporting system (OSS) to take care of its supply chain.

The first phase of the SAP implementation focused on enhancing management supporting system (MSS) to optimize internal processes. Telecom's MSS became a powerful platform, delivering a wealth of benefits. The major advantage for China Telecom is the visibility of information due to seamless data integration between different functions and data sources, allowing for comprehensive business analysis.

Under the new environment in which SAP BI is an integral part of mySAP ERP, the accounting, procurement, and engineering management functions, which used to be isolated before, are now fully integrated. This integration accelerates the flow of information and encourages active internal collaboration. "We have more information and a much quicker exchange of information, and that is the decisive advantage for us," says Liang.

In addition, the data integration between the accounting and human capital management functions allows easy analysis of personnel costs and performance-based payment plans, which in the past used to be an extremely time-consuming process. Another impressive advantage is the ease and speed of accessing information. "We have more information and a much quicker exchange of information, and that is the decisive advantage for us."

China Telecom Corporation "SAP ERP provides us with a single, consolidated, and timely view of our business. With SAP, we can make faster decisions and get a stronger grip on management control," says Liang. The success of the MSS implementation has built momentum to extend the use of SAP within China Telecom. At China Telecom, handling large volumes of data between SAP BI and SAP ERP posed a challenging test for the speed and processing capabilities of the server platform. Making critical data available 24x7 put unprecedented demands on the network storage and backup solutions. "High availability,

scalability, and high performance are key features critical to run our SAP applications,” says Liang.

China Telecom got the speed and computing power it needed to generate fast, timely, and accurate reports and analyses. “The computing performance of HP 9000 UNIX servers is to our entire satisfaction. The system is also impressively stable, and we did not get any complaints in that respect,” says Liang. “And on top of that, we benefit a lot from HP’s first-class customer support”.

In addition to an excellent price-performance ratio, the new infrastructure platform gives China Telecom the flexibility and scalability to dynamically respond to future changes in business needs and the expected growth in system demands. The roll-out of the SAP ERP into its other locations in China, in parallel, the company will make enhancements and introduce further developments to further maximize the benefits.

China Telecom has achieved an important first step toward that goal by linking MSS with the billing system in the BSS using SAP BI. “With the SAP and HP technology on our side, we will make it,” says Liang. When the project is complete, China Telecom will have a management cockpit with key performance indicators across all internal and external processes, further improving its business efficiency and competitiveness.

The above success story gives the true meaning of integration and the several different advantages and successes which was achieved.

4.2 NamITech Success Story

NamITech is a security solutions provider and one of South Africa's leading technology companies. Offering a diverse range of security products from casino gaming solutions and biometric devices to mobile SIM cards and bankcards, NamITech is at the cutting edge of global communications trends and technologies. Over the last few years, the privately held company has been experiencing rapid growth. But in order to stay ahead in the fast-changing world

of security solutions, NamITech needed to gain visibility into its many projects and the ability to react quickly to future opportunities.

NamITech's Challenge

NamITech has over 50 software development projects going on at any given time. Average project durations are 4-7 months plus several long-term projects. With a team of 35 highly skilled resources, efficiently managing resource capacity and utilization across all projects is key to both satisfying NamITech's clients and optimizing its operations. But two years ago, it was difficult for NamITech's management to get a clear picture of all ongoing projects or to accurately calculate an individual project's ROI.

Project data was scattered around the organization in copies of Microsoft Project and costs were tracked via a semi-manual process. "We were very successful in getting the products out, but there was no visibility into schedule, risk, and cost information," says Henry Hartman, Group Program Manager at NamITech. Because resources typically work on multiple projects and each project manager tracked project data in their own way, it was hard for NamITech to capture actual hours and costs accurately.



Consequently, simple questions about future resource capacity and profit margins on individual projects were hard to answer. "Timesheets and costs were done on spreadsheets and sent in to be processed manually. And it was just a nightmare," continues Harman. "Time would get billed to the wrong project and project costs would often be disputed by the project manager. What we needed was a common process and a software system to support it."

Solution

Two years ago, Hartman was put in charge of the NamITech program office with the goal of standardizing and centralizing project management practices and information. With a wealth of experience in managing projects and strong support from NamITech's CEO, Hartman got to work. As with any successful software implementation, Hartman started with the processes.

"My first objective was to get a methodology. So, for the first 2 months I just looked at what was going on and what the project managers were doing," reveals Hartman. "We then defined a common process for use on all projects right from start-up. We looked to the PMI's PMBOK® and other popular methodologies as the basis and we went back to basics.

We now have a rigorous methodology that combines detailed checklists and templates, including business analysis, project management, and quality sections. And everything is based on the same Work Breakdown Structure outline." Once the final methodology was defined, training was conducted for the entire company on the new process. This all took about six months.

The final piece of the puzzle involved pulling together all of the project data that was previously scattered around the company in copies of Microsoft Project. "There were always problems getting the data from the project managers because people were scared that if they did a 'Save As' they would lose the baseline," says Hartman. "So we ended up with a new version of the project every time progress was entered. We needed a centralized system that would allow us to integrate all of our project and resource data."

When the time came to select a standard tool for project and resource management, the choice was easy for Hartman and his team: Open Plan. Hartman had used Open Plan since 1986 and the system had proven its capabilities many times in the field. One project success that Hartman had recently experienced with Open Plan was also at NamITech.

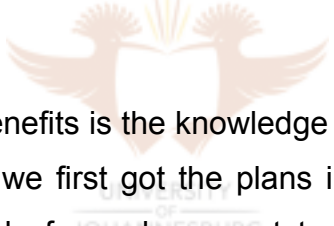
Prior to setting up the program office, Hartman had been the project manager for the ERP implementation at NamITech. This was the first implementation of Oracle 11i in South Africa. But despite the problems that are notorious with ERP implementations, Hartman was highly successful. "I ran my project with Open Plan and I did my own costing system. And I came in on schedule – to the day – and under budget! We were the first Oracle 11i implementation from the ground up... it was bleeding edge!" The use of Open Plan at NamITech was then

extended to support the entire program office and to integrate with their portal and Oracle Projects.

Results

Once all projects were in the portal and data was migrated to Open Plan, everything became visible. "We now have about 15 project managers using Open Plan at any given time and all data is contained in one database. So we can now do multi-project analysis - we live by that!" states Hartman. With the data now centralized, NamITech is also able to take advantage of Open Plan's powerful resource management and cross-project reporting capabilities.

NamITech has a common resource pool defined in Open Plan with the same rates as in their ERP system. Project schedules are all resource-loaded and statused weekly. Developers can enter their progress and completion estimates through the portal, which is then fed daily into Open Plan. With the latest data and projections, Open Plan can then perform resource balancing and sophisticated resource utilization analysis. These capabilities have already brought significant benefits to NamITech.



A good example of such benefits is the knowledge that NamITech now has about its future capacity. "When we first got the plans into Open Plan from Microsoft Project, the combined total of man-hours outstanding was estimated at about 40,000 hours," says Hartman. "But once we started planning and progressing the networks in Open Plan, because a lot of progress had not been updated in MSP, we found that the workload was only about 18,000 hours! So the perceived volume of work dropped by approximately 22,000 hours and the number was then real; this then created the capacity for us to take on new work."

With an expected growth in the volume of projects, and a recruitment cycle for certain skills that can take up to 18 months, securing current and future resource visibility is more critical than ever for NamITech. "Now, we are getting that visibility," concludes Hartman. "We know how much extra work we can actually take on. And we're at the stage where the development managers are using Open Plan to plan their own resources. So, we're taking it one level further." Now that resource visibility is secured, NamITech can take on additional cutting-edge technology projects with confidence.

4.3 City of Cape Town

City of Cape Town merged seven autonomous local authorities to form one mega city. The city chose Accenture to create a large-scale Enterprise Resource Planning solution to support the new administration in its provision of world-class services to its 1.2 million customers.

Cape Town, South Africa's second largest city, is home to 3.2 million people spread over an area of 2 475 km². In December 2000 this area—which comprised seven autonomous local authorities—became one of South Africa's new mega cities in line with national government's strategy of sharing the resources of adjoining municipalities in major urban areas.

The city employs 27,000 people. It provides services ranging from electricity, water, waste removal, city police and public amenities. Its annual operating budget is R7 billion and the capital budget is about R2 billion. Cape Town wanted to operate as a world-class city, efficiently supplying top-notch services to its 1.2 million customers. To achieve this it had to merge the disparate and dispersed administration systems of seven municipalities. This daunting task involved 62 legacy systems processing hundreds of different processes for 4,000 users.

In March 2001 the city embarked on a rigorous selection process to select partners and products that would support its vision of a being world-class operation. Accenture was chosen because of its successful track record in delivering large-scale Enterprise Resource Planning (ERP) projects at organisations such as the Eskom electricity utility and the Rand Water Board water utility, and its "can-do" approach to the mammoth project.

The project was put under extreme time pressures because the city, which was undergoing a major structural reorganisation to become a mega city, needed to have administration support in place as soon as possible. It also wanted to quickly benefit from anticipated cost savings. Cutting out the maintenance bill on the legacy systems alone is expected to save R60 million annually.

In January 2002 a full-time, 200-member project team, comprising an equal number of Accenture and client personnel, was formed and moved into a project centre in an exhibition hall at Cape Town's Civic Centre. Part of Accenture's team

was drawn from Maseko Bytes, an Affirmative Business Enterprise specialising in technical support and implementation.

Through a series of workshops with the client a three-phased rollout of SAP's Public Sector V4.6C application was adopted. The first phase—to be completed within a year—involved the implementation of human resources, payroll, financial accounting, management accounting, asset management and materials management.

Working around the clock, the team completed this phase by December 2002 when more than 2,000 users went live on these applications which enforce rigour in the core of the city's administration by bringing a uniform approach to key business processes.

The second phase, which went live in a pilot site in February 2003, focused on revenue management services embracing the customer-facing applications such as customer care, device management, payment and debt management, billing, real estate, treasury and rates. Phase three, when the proven phase two applications were rolled out to other areas of the city, went live in October of 2003.

The City of Cape Town's administration is already feeling the benefits of productivity improvements through working to standardised processes and procedures and better communication between divisions.

Apart from the R60 million saved by dispensing with the legacy systems the city expects further savings, such as:

- R40 million saved annually by standardizing and co-coordinating procurement practices and reducing the number of suppliers. Better stock visibility at depots around the mega city reduces the tendency to overstock. The online availability of improved approved product catalogues ensures cost-efficient buying procedures.
- R20 million will be saved on staff costs when, through natural attrition, posts will not be refilled because the system has taken over many of the functions that were duplicated after the seven municipalities merged.

The City of Cape Town expects a return on its investment in the new SAP

system to be realised within 27 to 42 months.

5. CONCLUSION

While ERP systems are packaged software applications, the majority (60%) of project cost is devoted to setup, installation and customization of the software, services typically provided by outside consultants such as Andersen Consulting or EDS according to Hitt et al. (Not Dated:2). Success or failure depends on the effective collaboration among these teams, the business knowledge of internal business experts and the technical skills of outside IT consultants.

Given the scale of ERP implementation projects as well as the possibility for both large successes and failures, it is reasonable to expect that ERP deployment have a significant and measurable effect on firm performance.

ERP system implementations provide numerous benefits and additional advantages to companies that do implement them. From a management stand point the ability to better manage the company with the information available provide enormous advantages. Customer services has become more and more important and ERP systems provides a basis to service customers better and allows better interaction with customers, either through personal contact or via the internet for better communication.

Resource management and the planning of work with the people aspect have just got easier with better planning and management of skills. The expensive infrastructure of legacy systems and the fear of always keeping these systems up to date and the support thereof have been minimised. ERP system vendors spend millions of dollars on research and further development of these ERP systems to always allow the best of breed processes to their clients. New releases are released on a regular basis that allows customers to upgrade to the latest and greatest versions available.

The assessment of the benefits and the successes from the consultants' perspective is mostly based on the ease of use of the new system and the

successful rollout after the configuration and the training has been completed. For the business people the systems normally seems very difficult at first and no benefits are realised at first, the actual performance of the company as a whole decreases just after the solution has been rolled out. After the system has stabilised the true value of the system is starting to realise and the business resources starts realising the ease of the processes and the integration benefits.

Long after the implementation has been completed, benchmarks are done in regards to the old legacy systems and the customer satisfaction percentages increases, cost savings are realised, better management decisions are made that saves the company much more money.

Most of the benefits from information technology do not come from simply implementing these new technologies, they come from inventing new business processes and new ways of interacting with customers and suppliers that have been enabled by the technology. The bigger benefits will be realised from the way in how the supply chain is better organised, better interaction with customers and not simply by just installing new technology into old business processes. The limits of the benefits of ERP systems are endless – some just still need to be discovered.



In chapter 5 a brief summary, recommendations and evaluation of the research of the short dissertation will be discussed. The most important aspects that have been discussed in the previous chapters will be highlighted and future research opportunities have been indicated. The future of ERP systems is also briefly discussed.



CHAPTER 5

EVALUATION, RECOMMENDATION AND SUMMARY.

CONTENTS

	<u>Page</u>
1. INTRODUCTION	93
2. RECOMMENDATIONS	94
2.1 Managing change for ERP systems	94
2.2 Further research	95
2.3 Summary	96
3. CONCLUSION	96



1. INTRODUCTION

The key objective of this short dissertation has been to have a better understanding of what evolve around the implementation of an ERP system, to set a framework for implementing ERP systems and to have a better understanding of what ERP systems are capable of. The importance of implementation approach with the element of business process re-engineering within the implementation of an ERP system was highlighted.

Another aspect of the research has been the close interrelationship between project management and the success of the project. The project management aspect concludes an extreme importance for the successfulness of any implementation.

One more aspect was the elements of project management and the tools that can be used in assisting the project management team. A lot of emphasis was also placed on one of the elements of the project management - change management and the importance thereof. Involvement from the key stakeholders and top management from the very start of the project is required to ensure that the rest of the company is supporting the new technology that is about to be implemented.

The final aspect of the research focused on the potential benefits and advantages from ERP systems. They varied with different types of benefits arising at different points in time. Early in the ERP experience benefits arise from both the IT infrastructure and the re-engineered, IT supported operational processes. Additionally, benefits may arise from improved management decision-making, especially with respect to day-to-day operational matters.

All these benefits seem to result from straightforward use of the technology. Organizations should plan to achieve these earlier benefits as quickly as possible, normally within the first few years of adopting the ERP systems. To ensure that attention is focused on attaining these benefits, metrics and milestones should be established and measurements made to reflect the organization's progress towards these goals.

At later phases in the ERP implementation, the potential for organizations to gain additional benefits associated with better management decision-making. These benefits were likely to only arise after a number of years after ERP implementation has been rolled out. Success in this area may rely heavily on leveraging the data and information from the ERP system. The efficient and effective use of information as a strategic resource in a company is becoming more and more important. The real competition is for better customer services and more informed decision making.

2. RECOMMENDATIONS

The degree of integration of information achieved by ERP systems implementation is claimed to be the central benefit of ERP systems. We are still struggling to understand and master ERP systems implementation but, software solutions are rapidly moving to an even higher level of complexity.

2.1 Managing change for ERP systems

The only constant in life is change. ERP systems are waiting to undergo additional changes. IT managers spend months and years installing ERP solutions to help organizations operate more efficient. The question of how organization has changed because of the new processes and the new system. The change should have had a positive change within the company and if the employees have accepted the change in the organization.

Though, managers are going to come face to face with this reality, and probably sooner rather than later. The problem is that many enterprise resource planning (ERP) systems don't readily accommodate change. Focusing on the elements of project management is a way of addressing the challenges of implementing an ERP system without the difficulty of change resistance.

When considering the project management perspective it is anticipated that future research can go in two directions:

- a. Expanding the focus of research from project management to include the extended elements such as change management, knowledge management, risk management and other disciplines; and
- b. Conducting more detailed research in the project management discipline, such as validating the recommendations presented in this study through case study of actual ERP implementation projects.

A high level of business complexity does not necessarily implies the need of an ERP system. An ERP system imposes its own logic on the company strategy, organization and culture, this decision affects most of the company business functions and directly involves a significant number of people. The project team responsible for ERP implementation will be challenged to either match the functionality of the application to business practice or find ways to adapt or change current processes and procedures.

2.2 Further research



The current poor global economic climate, user saturation and over-inflated expectations have all had an impact on the ERP systems market for sales in 2003 and beyond. However, the move towards vendor development of ERP systems which support customer relationship management and supply chain management will involve many large and medium sized organizations in intense human and financial investment in complex system implementations over the next few years.

This short dissertation presents an overview which maps the ERP implementation approach and benefits on success, against their locus of control of project governance, IT governance or organizational governance. The aim of future research will be to develop an understanding of how changes should be managed and where responsibility for control and risk factor mitigation should sit in the organizational hierarchy.

Additional research can also be performed to enable more effective ERP implementation by more detailed analysis of the risks and influences of the implementation partners which are chosen.

2.3 Summary

Because of the expected benefits, ERP systems are very widely spread and there is a lot of competition out there. More medium sized firms are now implementing ERP systems, because of the visible benefits and the successes which are achieved. If the success of an ERP project is evaluated as positive in the whole the causing success factors needs to be noted and that factors communicated to future implementations.

In ERP projects, companies that pay particular attention to educating employees and communicating future changes to the entire company tend to have much better chance of achieving project success. The project management approach including all the additional elements their off normally contributes to these successes. When companies decide to implement an ERP system all these important factors need to be communicated to them. This would ensure a much smoother implementation and decrease the direct impact on the users and maximize expectations of the ERP system.

Although a number of these elements can be categorized into other disciplines, such as change management, training, etc. but the project management concepts plays an important role in the success of ERP implementations. The key is to balance the needs of current work and the new system.

3. CONCLUSION

Selecting and implementing a new ERP system, and the process changes that go with it, is unquestionably a complex undertaking. Regardless of your size and perceived resources, an ERP implementation is not something that should be approached without a great deal of careful planning.

The purpose of ERP technology is to support the business processes that support the company's strategic opportunities. ERP system benefits are a direct result of effective preparation and implementation, and appropriate use. ERP software selection and implementation can support your strategic and process objectives better. When the ERP system is not fully integrated into day-to-day business operations, it is not likely to be very beneficial.

"... for many companies, ERP is the foundation for e-commerce. Companies rely on their mission-critical ERP systems to procure, manufacture, and deliver products and services to an increasingly demanding and web-savvy customer base. Tight integration between customer-facing systems, such as Customer Relationship Management (CRM) and web storefronts, and supplier-facing procurement and supply chain planning systems extends ERP into an end-to-end infrastructure. In fact, industry analysts have begun to describe these systems as collaborative-commerce systems"

HP (Not Dated:2)

Top management support and project champion is essential, the level of commitment by senior management to the project in terms of their own involvement and willingness to allocate valuable organizational resources is key. The ability of top management to undertake the cultural, political and structural change is necessary for successful ERP system implementation.

Training with a focus on the new business processes, technical aspects of the system and end user needs is a key part of successful ERP system implementation. An ERP system is built on the scope of the blueprint and the business process re-engineering and that forms the basis of the new integrated system.

An implementation with the appropriate vendor, implementation partners and the correct (proven) methodologies are bound to be successful. There are a lot of benefits to be realized and the evolution of ERP system has just begun.

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