STRATEGIC ADVANTAGE THROUGH THE IMPLEMENTATION OF ENTERPRISE RESOURCE PLANNING SYSTEMS

By

Johannes Hendrikus Viljoen
Student Number: 201 509 689

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The Graduate School of Business, Faculty of Management
University of Natal (Durban)

Supervisor: Prof. Elza Thomson

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CONFIDENTIALITY CLAUSE

15 September 2003

TO WHOM IT MAY CONCERN

RE: CONFIDENTIALITY CLAUSE

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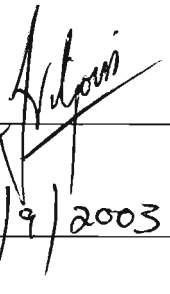
Sincerely

J.H. VILJOEN

DECLARATION

This research has not been previously accepted for any degree and is not being currently submitted in candidature for any degree.

Signed 

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STATEMENT

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ABSTRACT

Enterprise Resource Planning (ERP) systems claim to provide organisations with an integrated Information Technology (IT) solution that can be used as an effective business tool with real-time information of all business transactions at the managers' fingertips. ERP software attempts to integrate all departments and functions across a company onto a single computer system that runs off one database and can serve the needs of all the different departments in the company.

The investment in an IT solution that will provide strategic information to aid in strategy formulation and decision-making should be part of strategic planning. In short, the ERP system should add to a company's strategic advantage. The challenge to an organisation is to use ERP to leverage opportunities in the competitive environment in order to create value. If a resource view is taken of ERP systems, strategy theory describes the way that an organisation should go about achieving strategic advantage.

The IT resource in itself cannot be the basis for competitive advantage in a manufacturing industry. The resource is available to all competitors. The nature of ERP systems however supports the creation of distinctive competences in the organisation through organisational learning. The enhanced capabilities of the organisation, combined with its superior resources form the basis of distinctive competencies that in turn lead to value creation through the advantages created. The test for strategic advantage is to evaluate the strategic options or choices against consistency, consonance, advantage and feasibility.

The model for evaluating strategy can also be applied to the planned ERP implementation or to enterprise systems already implemented. This model is based on strategic evaluation and support the process of continuous evaluation and change to respond to triggers in the competitive environment the organisation operates in. In order for ERP systems to add value in the organisation, their implementation must satisfy the strategic evaluation criteria, and continuous business process improvement will follow subsequent evaluation in order to adjust to the changing environment.

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1.1 Introduction

In the current times of economic difficulties and uncertainty, organisations are currently looking for ways to improve their efficiency. Business is taking place quicker, the volumes of transactions taking place increases by the day and information is as important as cash flow. Many companies turn to Information Technology (IT) as one tool to address this requirement.

Enterprise Resource Planning (ERP) systems have now for many years claimed to solve this problem by providing integrated IT solutions as a tool for effective business with real-time information of all business transactions at the managers' fingertips. In his article for Darwin Magazine, Koch (2001) defines Enterprise Resource Planning software as an attempt to integrate all departments and functions across a company onto a single computer system that runs off one database and can serve the needs of all the different departments in the company.

The problem however seems to be that once these systems are implemented, they just do not deliver as expected or promised. The complication to the non-delivery is that these systems represent a significant investment in capital, time and other resources. This is not an investment likely to be discarded in search for another more suitable solution.

It seems that the investment in an IT solution that will provide strategic information to aid in strategy formulation and decision making should therefore also be part of strategic planning. In short, the ERP system should add to a company's strategic advantage. In order to research this further, Toyota South Africa will be used as a case study.

1.2 Background of the Research

In 1961, the late Dr Albert Wessels obtained an import permit for 10 Toyopet Stout bakkies from Japan and a new business was started that would grow into a world-class

competitor. Three years later the first Toyota shares were sold to the public while vehicle sales increased to 2 332 units. In 1968, Toyota became the largest producer of commercial vehicles in South Africa and was chosen as "Company of the Year" by the financial press. This is a position that the company maintained throughout its history.

By 1980, Toyota became the South African market leader based on total vehicle sales. Four years later, Dr Wessels signed a new long-term franchise agreement with Toyota Japan. By the end of the decade, Toyota celebrated its tenth year of market leadership in South Africa. In 1991, Dr Albert Wessels passed away, and his son, the late Bert Wessels took over the family business as Executive Chairman. The company continued to grow from strength to strength under the leadership of Bert Wessels, and in 2000, Toyota celebrated its 21st year of overall market leadership with a 23.3% share of the total vehicle market in South Africa.

In 2002, Bert Wessels passed away and the reigns to Toyota South Africa is handed over to Dr Johan van Zyl who is appointed President and CEO of the company. The company however has not fallen out of family hands as Mrs Elisabeth Bradley (Bert Wessels' sister) is appointed as Chairman by Toyota South Africa. In the same year, Toyota Motor Corporation doubled its ownership in Toyota South Africa by acquiring additional shares from Wesco Investments, the listed investment vehicle of the Wessels family, to own 75% stake in the company.

At the same time, the export division for Toyota South Africa was also restructured, and in a press release it was announced that the company would become the global supplier for a new vehicle project, including pick-up trucks, multi purpose vehicles and major vehicle components from 2005 onwards (Toyota's History 2003).

During the most part of Toyota South Africa's phenomenal growth, IT has played an ever-increasing role. By the mid 1990's, the company started to realise that their mainframe systems were becoming outdated and with the looming year 2000 scare, a choice was made to implement an ERP system that will replace the plethora of old mainframe systems and take Toyota South Africa into the new millennium. The choice it seemed was much easier than the implementation.

Applegate, McFarlan and McKenny (1999, p. 5) stated that the strategic impact of the IT activity varies among industries and firms, and over time, within an individual firm. It can be used in all firms to enhance operations, but amongst a growing number of firms, starting in the 90's, it is also a core differentiator and strategy enabler.

The reality of implementing ERP systems is in stark contrast to what Applegate, McFarlan and McKenny suggested and leaves one to ask: What do companies expect of an ERP system? Ulrich (2003) further states that if the migration from a legacy system to a new system goes wrong, "... a company can be burdened with unnecessary expenses, lost data, or a system that is a white elephant. Even worse, a company's business strategy or a fundamental business process can go begging for adequate technical support".

Many large and medium sized companies are venturing into the world of ERP systems, believing these to provide the solution they looked for. This move requires a substantial capital investment as well as a constant drain on resources, both financial and time, before any benefit is seen. The end result in most cases are not what was expected, leaving many CEO's, MD's and managers disillusioned with the ERP system they implemented and due to the large cost involved, there is no turning back.

"Competitive strategy is about being different. It means deliberately choosing a different set of activities to deliver an unique mix of value" (Porter 1996, p.77). In 1980, Michael E. Porter developed his model of five competitive forces in his landmark book "Competitive Strategy: Techniques for Analysing Industries and Competitors" and since then it has become an important tool for analysing an organisation's industry structure in strategic processes. This model is based on the insight that a corporate strategy should meet the opportunities and threats in the organisation's external environment. These five forces are bargaining power of suppliers, bargaining power of customers, threat of new entrants, threat of substitutes and the competitive rivalry within the industry. The information gained from the five forces analysis can provide valuable information in three aspects of corporate planning, namely statical analysis (the attractiveness of the industry), dynamical analysis (used with PEST analysis, it reveals insight in the future attractiveness of the

industry) and analysis of options (develop options to influence the competitive forces in a way to improve own competitive position).

Recklies (2001a) in his article "Beyond Porter – A critique of the critique of Porter", demonstrate that these five forces are indeed only microeconomic forces that have stood the test of time, but also list three new forces that must be taken into account. These three new forces are introduced by Downs (1997) in his article, "Beyond Porter" and are digitalisation, globalisation and deregulation. He states, "No doubt the foremost difference between strategy in the Porter world and in the world of the New Forces is in the role of information technology."

In order for firms to compete in a dynamic business environment, both domestic and internationally, it has become a necessity to utilise IT. The use of IT helps companies to deal with high volumes of transactions and information effectively and ideally, efficiently. Even if these systems do not meet the expectations and requirements of the organisation, they still become critical in the daily operations and few can cope without these systems for a prolonged period of time.

Once an analysis of the organisation's circumstances has been made and strategic options are formulated, or implemented, an evaluation of the chosen strategy needs to be done. In assessing or evaluating strategies, it is also important to include the IT requirements. These requirements should either support the company's chosen strategy or add competitive advantage. The study will consider the use of various evaluation criteria like suitability, acceptability and feasibility for assessing strategies and their possible application in evaluating the implementation of ERP systems (Johnson & Scholes 1998).

Suitability is a broad assessment of whether the strategy addresses the circumstances in which the organisation is operating and lends itself for qualitative assessment. This could be the extent to which new strategies would fit with the future trends and changes in the environment or how the strategy might exploit the core competence of the organisation.

Acceptability is concerned with the expected performance outcomes if the strategy were implemented, and the extent to which these would be in line with the expectations of stakeholders. Risk versus return is usually the key-determining factor.

In determining the feasibility of a chosen strategy, the evaluation is merely concerned with whether the strategy could be made to work in practice. Assessing feasibility is often a quantitative exercise assessing the practicalities of resourcing and strategic capability.

Rumelt (1999) list four broad criteria that encompass most of the tests that could be applied to evaluate business strategy. These criteria are consistency, consonance advantage and feasibility. Consistency is a key function of strategy and has to provide coherence to organisational action. The strategy must not present mutually inconsistent goals and policies, but should foster a climate of tacit co-ordination within the organisation. Consonance is the ability of the organisation to both match and be adapted to its changing environment and at the same time compete with other organisations that are also trying to adapt. Competitive advantage stem either from superior resources, superior skills or superior position. Skills and resources represent the ability of an organisation to do more and/or do it better than its rivals do. Feasibility, as seen previously, evaluates the strategy to ensure that it neither overtax available resources, nor create unsolvable sub problems.

Due to the limitations, the four broad criteria will form the basis for a model in order to evaluate the strategic impact of ERP. This should however not be regarded as the definitive evaluation, but rather a method of eliminating options and the basis for further detailed analyses.

1.3 Motivation for the research

Due to the high costs involved when implementing an Enterprise Resource Planning solution, a clear guideline is required for firms when formulating strategic plans and making strategic decisions. The inclusion of IT in any organisation's strategic planning process is important, and of even more importance is the role the IT systems play in the effective management of these organisations. The research will

concentrate on evaluating the role ERP plays, or should play, in the strategies of organisations in South Africa. A model for the evaluation of the role ERP should play in strategy formulation and planning will be developed. This model will aid organisations utilising ERP or planning to either implement ERP or replace an existing solution in order to determine the role of ERP in the organisation's strategy.

1.4 Value of the Project

The study will endeavour to identify the conditions that must be met for an ERP solution to add strategic advantage for an organisation and guide firms in identifying the role these systems should play in the organisation's strategy. This in turn will translate into lower cost of ownership and better return on investment for the company that can add to long-term sustainable competitive advantage.

1.5 Problem Statement

The problem being addressed in this study can be formulated as follows:
Does the use of Enterprise Resource Planning (ERP) systems support the organisation to gain strategic advantage?

1.6 Objectives of the Study

The objective of this research is to evaluate the investment in ERP systems and whether this investment can add to or achieve competitive advantage for the firm implementing the system. CEO's, MD's and CIO's must be clear as to what they expect from an ERP system in order to support and add to strategic advantage as well as what exactly is required in order to have or gain strategic advantage.

The research will attempt to identify the conditions required for ERP systems to add or help companies gain competitive advantage. A model will be developed in order to help determine how IT will add to strategic advantage.

A further objective is to determine how the implementation must form part of the strategic plan and how to avoid dissatisfaction with the implemented ERP solution.

1.7 Research Methodology

The research will be conducted by using a qualitative methodology. Rudestam and Newton (2001) stated that qualitative methodologies generally share 3 fundamental assumptions, namely a holistic view, an inductive approach, and naturalistic inquiry. The holistic approach stresses that the whole is different than the sum of its parts. Consequently, qualitative methods seek to understand phenomena in their entirety in order to develop a complete understanding of a situation. Qualitative research begins with specific observations and moves towards the development of general patterns that emerge from the cases under study (inductive approach). Thus the research is a discovery-orientated approach in the natural environment (naturalistic inquiry) that is intended to understand the natural occurring phenomena.

The approach that will be followed is that of the case study by observing the current ERP implementation at Toyota Manufacturing Division. Due to the nature of the study, a hypothesis will not be stated or tested. The research will further make extensive use of secondary data.

1.8 Limitations of the Research

The research will be limited to observations and information from Toyota South Africa and their implementation of ERP systems. Due to the fact that the author is not a permanent employee of the company, sensitive information will not be made available, and only information in the public domain will be used.

1.9 Structure of the Study

The study will be presented using the standard layout prescribed for the dissertation. In chapter two, the theory in strategy and the evaluation there of will be explored and presented. A model for the evaluation of the strategic advantage obtained through the use of information technology will be developed. This model will be used in chapter four to evaluate the information obtained and presented in chapter three.

Chapter three will be the detailed presentation of the case study. The model developed in chapter two will be used as a framework to write the case study. The information will consist mainly of the observations and information obtained on Toyota South Africa in the public domain and through direct observation.

As mentioned before, chapter four will evaluate the information in chapter three using the model from chapter two to determine strategic fit. This chapter will in essence determine the gap in a gap analysis and the extent of this gap. In other words, how effective is the implementation of an ERP system and the employment of information technology in obtaining strategic advantage for Toyota South Africa?

Finally, chapter five will deal with the findings. Recommendations will be made regarding shortcomings found and solutions for solving these will be presented. The use for the model in future strategic planning or change will be presented in order to achieve strategic advantage when using information technology, with special emphasis on ERP Systems.

1.10 Summary

The research will aim to bring IT in context with an organisation's strategy. For an organisation to survive in business, locally and internationally, it must posses strategic advantage, or create this through the effective use of its resources and capabilities. Through a resource view of information technology, and recognising opportunities for IT to build new, or enhance existing capabilities, distinctive competencies can be created that could ultimately result in value creation.

In order to analyse this process, it is necessary to look at the theory first. The competitive advantage achieved through the use of ERP must be viewed in the light of how an organisation's strategy leads to value creation. The strategy formulation and evaluation process must be thoroughly understood.

2 CHAPTER TWO

2.1 Introduction

The rapid growth, evolution and spread of information systems technology (IT) in the past 40 years are challenging organisations to rethink the very nature of business. New terms have evolved through these changes like "Information Economy" and "New Economy" and claim to redefine all the old rules of doing business. Businesses are faced with ever increasing choices and pressure to change their information technology structures and to "get on the bandwagon". Systems are developed that profoundly affect how organisations, from very small to large multinational corporations, operate and compete. This also leads to the question of planning and budgeting for investment in IT (both computers and software).

Bower (1986) states that the problem of efficient allocation of resources has intrigued both managers and philosophers from the earliest times. This was initially explored in treatises that dealt with the choices of individuals who wished to increase their wealth by better use of resources. The study of the wealth of nations emerged when the use of resources by rulers was further explored. The study of economics was thus concerned with the economic choices of individuals, including firms, and nations. "The set of problems corporations refer to as capital budgeting are general management problems. They involve those strategic moves which direct an organisation's critical resources toward perceived opportunities in a changing environment" (Bower 1986, p.7).

The fact that IT is playing an increasingly important role in business cannot be disputed. Dramatic improvements in price vs. performance of IT over the past three decades and linked to the increased penetration of IT within the organisation as well as the learning that accompanies experimentation and use, have allowed computer systems to move out of the back office and to create significant competitive advantages (Applegate et al 1999). IT is one of the many resources that should be understood, and correct usage decisions need to be made in order to achieve competitive advantage.

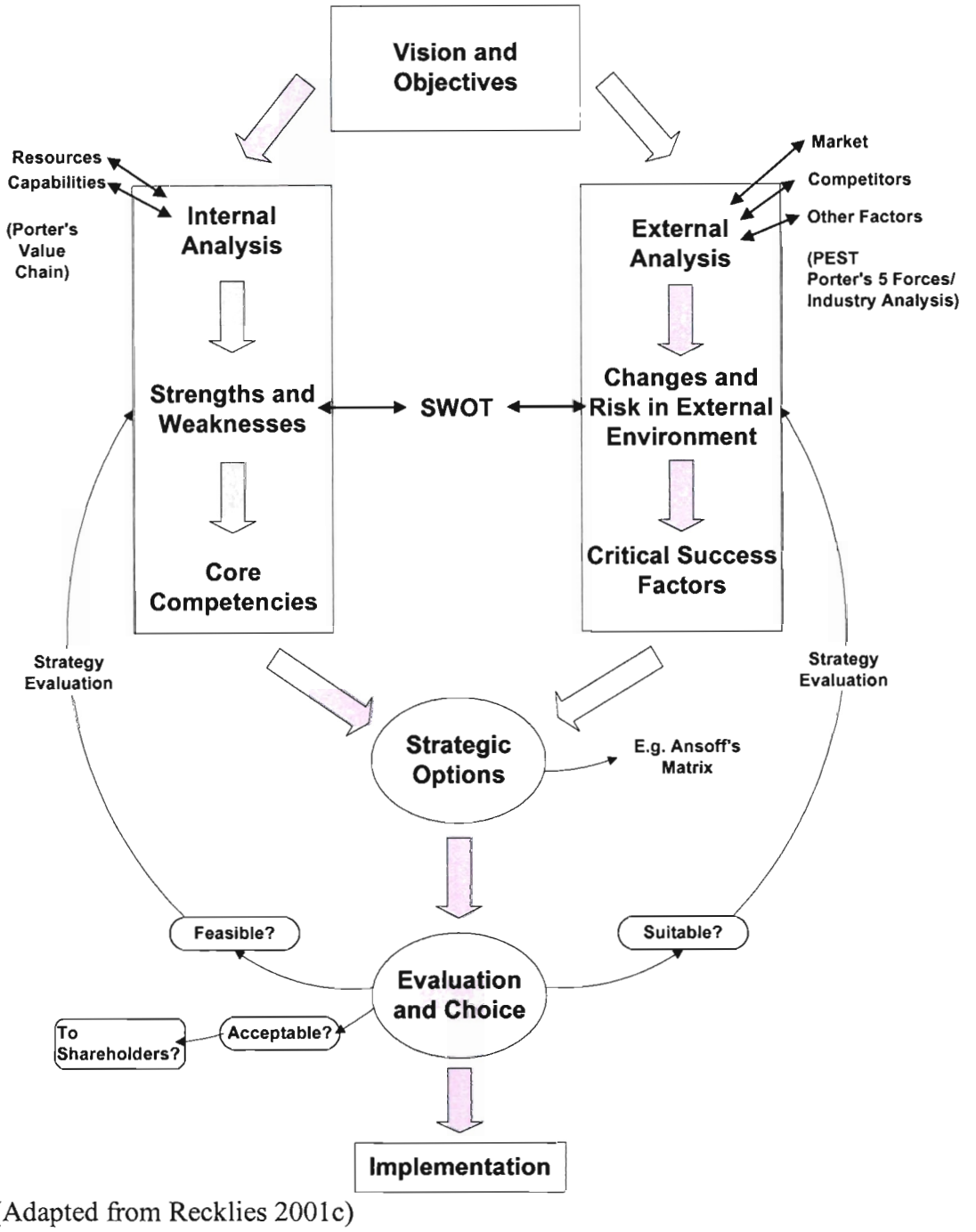
The strategic impact of the IT activity varies amongst industries and organisations and, over time, within an individual organisation. Introducing the information technology challenge, Applegate et al. (1999) noted, "It would be a serious mistake to think of the problems of IT management as totally different from those found in other business areas... Issues of IT strategy formulation are heavily influenced by theories of industry analysis and business planning." IT can be used in all organisations to enhance operations, but for a growing number of organisations since the 1990's, it is also a core differentiator and strategy enabler. IT must therefore form part of the strategic processes of an organisation and should support the activities, from planning through to execution, for creating strategic advantage.

2.2 The Strategic Planning Process

Traditional strategic planning assumes a predictable future and one that is understood. Strategies are thus seen as a means for achieving competitive advantage in a stable environment by exploiting competences and resources. Lynch (2000, p.84) states that to make sense of strategy, it is useful to consider the history of an organisation in three areas. These areas are: how the organisation's processes have developed; how the organisation is positioned with regard to its competitors; and how its paths have developed in the past and are envisaged to continue in the future.

Figure 2.1 demonstrates the process of traditional strategic planning and how the various processes fit together. Determining how to best utilise the organisation's capabilities and resources in developing competitive strategies are part of the internal analysis process while the external process is concerned with the market analysis, analysing competitors and determining other factors. Once the analysis is done, strategic options are formulated followed by an evaluation process of these options in order to make the final choice for implementation.

Figure 2.1 - Traditional Strategic Planning and its Limitations



(Adapted from Recklies 2001c)

According to Lynch (2000, p.12), the key strategic principles to achieve are:

a) Corporate strategy is the pattern of major objectives, purposes or goals, and the essential policies or plans for achieving those goals.

b) Strategy is developed by a consideration of the resources of the organisation in relation to its environment, the prime purpose being to add value. The added value is then distributed among the stakeholders.

c) There are five key elements of strategy, principally related to the need to add value and offer advantages over competitors: sustainability; process; competitive advantage; the exploitation of linkages between the organisation and its environment; and vision. Several of these elements may well involve innovative solutions to strategic issues.

A thorough understanding of the strategic process is therefore required in order to evaluate the options effectively and in order to make the most correct decision. In recent times however, there are hardly any markets left that show such stable and predictable conditions. Digitalisation, deregulation and globalisation have changed whole industry structures where the results are discontinuous, turbulent developments with high uncertainty for planning (Downes, 1997). Downes' three New Forces have not invalidated Porter's Five Forces but enhanced his ideas by bringing new avenues to achieving competitive advantage. Recklies (2001c) in his article, Strategy in Turbulent Times, deals with this new trend and discusses the need for new tools. Management theory and practice widely accept today that businesses operate in a more and more complex, dynamic, less predictable environment. This new environment requires managers to develop new ways of thinking and acting. Companies need to be more flexible and require strategic innovativeness in order to survive and attain sustained competitive advantage.

2.3 Sustainable Competitive Advantage

In deriving strategic options, both the internal environment of the organisation and the external environment it operates in should be analysed in order to form as complete a view of the business environment as possible. This view should give the organisation an understanding of its position within its competitive environment and its ability to operate effectively within this environment.

Porter (1996) defined competitive strategy for an organisation as the firm being different and deliberately choosing a different set of activities from their competitors in order to deliver a unique mix of value. It requires the resources of the organisation to be utilised in a unique way. Lynch (2000, p. 152) notes, "The main reason for analysing competitors is to enable the organisation to develop competitive advantages against them, especially advantages that can be sustained over time. Sustainable competitive advantage involves every aspect of the way that the organisation competes in the market place – price, product range, manufacturing quality, service levels and so on... To be sustainable, competitive advantage needs to be more deeply embedded in the organisation, its resources, skills, culture and investment over time."

It is no good just stating that competitive advantage should be achieved or that an organisation is maintaining competitive advantage, there should be proven facts and analyses to support this statement. Lynch (2000) name three possible tests that can be applied by the organisation in order to test and validate claims for sustainable competitive advantage as listed in table 2.1.

Table 2.1 - Three Tests for Sustainable Competitive Advantage

THREE TESTS FOR SUSTAINABLE COMPETITIVE ADVANTAGE
The advantage should be: 1. ***Sufficiently significant to make a difference.*** Modest advantages that hold no real benefits to the customer or the organisation are unlikely to be persuasive. 2. ***Sustainable against environmental change and competitor attack.*** The market as a whole may move forward in terms of technology or tastes. Equally, competitors may be able to copy advantages developed by the organisation. In both cases, these advantages are not sustainable. 3. ***Recognisable and linked to customer benefits.*** An advantage needs to be translated from a functional advantage inside the organisation – for example, low costs – into something that the customer will value – for example, low prices. Advantages that cannot be linked in this way ultimately prove to have no persuasive and competitive edge.

(Lynch 2000, p. 156)

The natural question to ask would be, "how does a organisation achieve sustainable competitive advantage?" Some companies are more profitable and more competitively successful than others, and this difference can largely be attributed to the differences in company resources. Thompson and Strickland (2001) name four tests that can be used to determine if a particular company resource can qualify as the basis for sustainable competitive advantage. These tests are formulated as questions that should be asked and answered as honestly as possible by the company:

a) *Is the Resource hard to copy?* The more difficult and more expensive it is to imitate a resource, the greater its potential competitive value. Implementing ERP systems is by no means an easy, or inexpensive project. There are many

hidden costs that include consultancy fees, training and change. All these factors make implementing a standard enterprise system like SAP, BAAN, JD Edwards or Oracle by no means a simple or standard activity (Ulrich 2003 and Koch 2001).

b) *How long does the resource last?* The longer a resource last, the greater its value. Technology is changing at mind-boggling rates and there are always new choices available to the organisation, and this fact poses one of the biggest problems to many organisations investing in IT. Even between the big ERP systems, change is inevitable and even necessary in order to stand out from its competitors and best meet customer requirements. The race is also on for staying abreast with the changing face of global businesses and the rapid pace at which the importance of e-commerce is growing (Porter 2003).

c) *Is the resource really competitively superior?* Companies have to guard against pride fully believing that their core competencies are distinctive competencies or that their brand name is more powerful that the brand names of their rivals. In addition, the utilisation and benefit derived from the use of Enterprise Systems (ES) are linked to the skills required in order to leverage information for decision-making (Davenport 2001). Core competencies can be viewed as "the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technology" (Hamel and Prahalad 1990). Core competencies and competitive advantage develop over time, making them more and more difficult for outside companies to emulate.

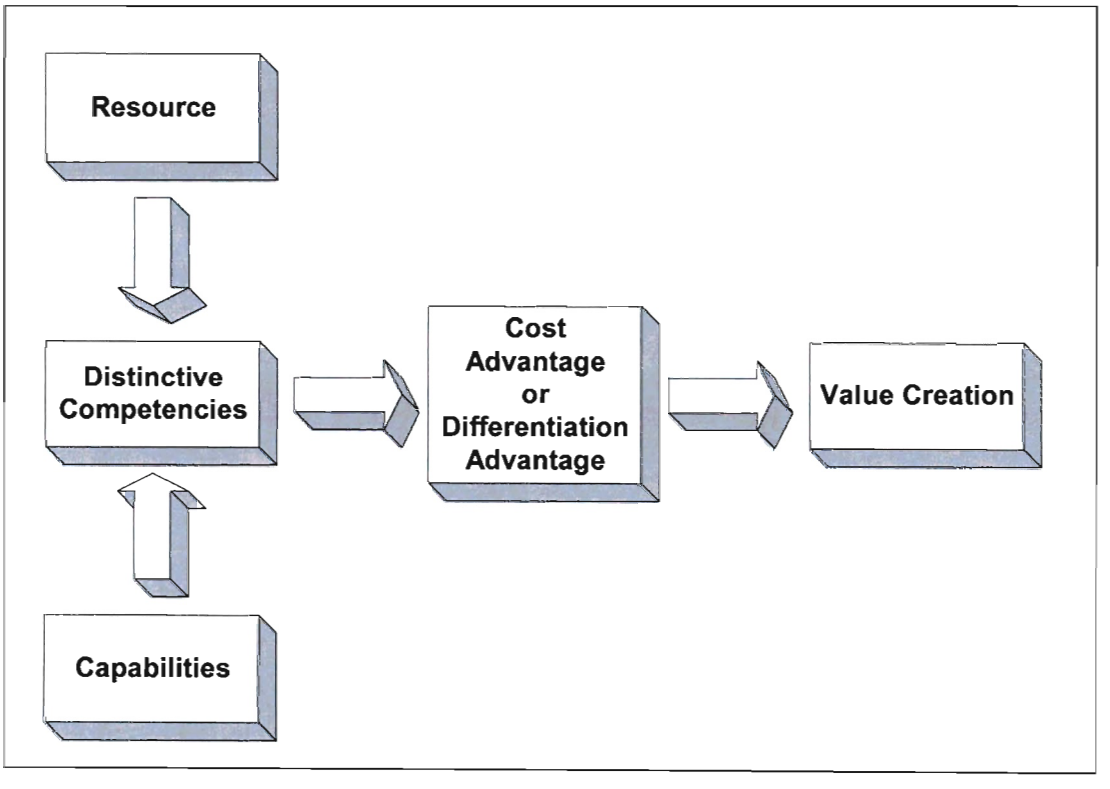
d) *Can the resource be trumped by the different resources/capabilities of rivals?* Leveraging new technologies and using it differently from competitors or rivals can lead to a company being more consistently profitable than its competitors, even if they utilise the same technology or enterprise system.

2.4 The Information Technology Resource

Thompson and Strickland (2001, p. 125) stated that when matching strategy to a company's resource strengths and weaknesses, "a company's strategy should be tailored to its resources – taking both strengths and weaknesses into account." Attention to building a strong resources base for the future, and to maintaining the competitive superiority of an existing distinctive competence, is an ever-present need for the organisation. Mancrieff (1999) goes even further when analysing the impact and role of strategy by stating, "it may be better at times to consider aligning intent with action – aligning strategy with the core competencies of the organisation."

A resource-based view of competitive advantage emphasises that an organisation utilises it resources and capabilities to create a competitive advantage that ultimately results in superior value creation. Figure 2.2 combines the resource-based and positioning views in order to determine value or competitive advantage.

Figure 2.2 - A model for Competitive Advantage



(International Centre for Management and Business Administration, 2002a)

IT as a resource should thus be used to strengthen areas used to compete in the market place. For a manufacturer, IT must enhance the manufacturing process by increasing quality and control, improving operations and creating value for the business. Lin and Shao (2000) found in their article, Relative sizes of Information Technology Investments and Productive Efficiency: their Linkage and Empirical Evidence, consistent empirical evidence that the relative level of IT investments in a organisation has a positive effect on that organisation's productive efficiency, implying that organisations who investing comparatively more in IT are likely to be more efficient in their production process than those investing less. These efficiencies form part of an organisation's distinctive competencies that will eventually lead to value creation through its impact on the organisation's positioning.

Carr (2003) in contrast, provides an opposing view and argues that opportunities for gaining strategic advantage from information technology are rapidly disappearing. He further points out that three new rules for IT management need to be taken into account as guidelines for the future:

a) ***Spend less***. Studies of Corporate IT spending consistently show that greater expenditures rarely translate into superior financial results; the opposite is usually true. IT could therefore put the business at a cost disadvantage.

b) ***Follow, don't lead***. As IT capabilities become more homogenised, being on the cutting edge rarely makes sense anymore. Waiting will decrease your risk of buying something technologically flawed or doomed to rapid obsolescence.

c) ***Focus on vulnerabilities, not opportunities***. It is unusual for a company to gain competitive advantage through the distinctive use of mature infrastructural technology, but even a brief disruption in the availability of the technology can be devastating.

Carr's arguments are relevant for IT as whole, but when core systems grow old and cannot cope with the ever increasing and changing demands placed on them, new investment becomes unavoidable. The need for systems that can support the changing face of business into the future cannot be dismissed by the three rules. As business

learning increased the organisation's dependence on IT, the need for more integration in the business processes and the assimilation of information lead to the emergence of ERP systems and other enterprise systems. ERP attempts to integrate all departments and functions across a company to create a single software program that runs off one database (Koch 2001). In order to meet strategic business objectives, executives will need complete, integrated, and systematic analyses and sharing in real time for marketing, finance, and marketing information and knowledge (Forgionne and Kohli 2000).

In his book, Mission Critical: Realizing the promise of Enterprise Systems, Davenport (2001), asks the question, "Does ERP build a better business?" Various aspects of implementing successful enterprise systems are investigated, and how leadership and a clear strategy form the starting point and building blocks for a successful implementation. Davenport concludes that a direct connection should exist between daily operations and strategic objectives, based on the decisions made to support the strategy. These decisions require timely and accurate information. To make these decisions and enhance the strengths of the organisation (and overcoming or avoiding the weaknesses), some organisational capabilities must be in place.

There are many potential elements of organisation and culture that must be aligned to support a business unit's use of transaction data. Implementing an ERP system necessitates change and therefore management must cultivate expectations for change. According to Koch (2001), in order to implement ERP and have expected returns, a company needs to change the way it does business, referring mainly to the internal business processes, but not excluding the external processes. Management must demonstrate the political will to act and follow through in applying the new insights and capabilities made possible through better ES data.

One of the benefits that a well-designed enterprise system offers is the availability of real time transaction data for decision making. A variety of skills and knowledge are however required to leverage transaction data for decision making. Davenport (2001) identified a number of skills that are required in the business unit in order to leverage transaction data for decision making:

a) Detailed knowledge of the unit's underlying business processes,

b) Strong knowledge of the industry,

c) Extensive skills for interpreting the meaning of the ES data, which requires understanding definitions of key elements, how they relate and their limitations for analysis,

d) Thorough working knowledge of several analytic and data presentation software packages, and

e) Strong interpersonal skills needed to train and support end users.

This list is by no means complete, but it does highlight the need for competent skills and a need for an organisation to invest in the training of its employees in order to maximise the benefit accrued over time by investing in an ES. "The ability to interpret and analyse transaction data can change the types of decisions being made, the confidence management has in making certain ongoing decisions and even the location of some decisions within a business process... Converting transaction data to knowledge is effective only if it produces outcomes that improve financial performance, which usually happens as a result of behaviours, new initiatives or redesigned processes" (Davenport 2001). Forgionne and Kohli (2000, p. 2) stated that "decision support, expert, and executive information systems can be used to provide the artistic, scientific and technological support needed for effective decision making."

A more practical approach however suggested by Sutcliffe and Weber (2003) in their research article on the high cost of accurate knowledge. They found that the way senior executives interpret their business environment is more important for performance than how accurately they know their environment. This does not however mean that the information required is not important or that no investment should take place in ES. The emphasis is placed on the fact that managers need to know how to interpret the information that is available through business systems.

The basis for gaining competitive advantage is to provide this information in an organisation specific way that cannot easily be duplicated by competitors. Even though the various ERP systems are available to all competitors in the market, implementing the enterprise system in a way that adds value will increase an organisation's capabilities. Capabilities here refer to the organisation's ability to utilise its resources effectively. Managers should therefore build their strategies around exploiting and leveraging company capabilities (its most valuable resource) and avoid strategies that place heavy demands on areas where the company is weakest or has proven ability (Thompson and Strickland 2001). Identifying a organisation's capabilities may not be that easy, but exploiting the value chain for opportunities in order to increase the organisation's capabilities can provide invaluable insight into leveraging IT opportunities.

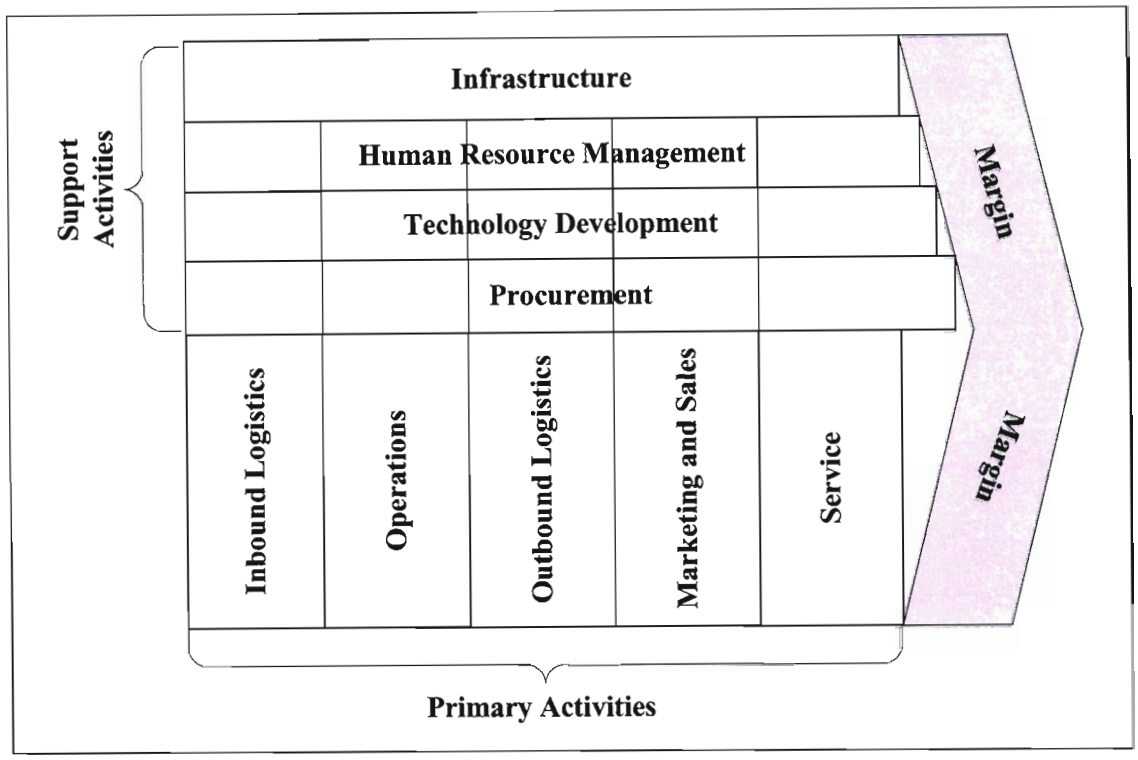
2.5 Analysing the Value Chain for Information Technology Opportunities

Resources and capabilities that are superior to those of the competitors form the organisation's distinctive competencies and this can be leveraged to provide advantage. Value creation will follow when the organisation performs a series of activities, described by Porter (1996) as the value chain. The value chain plays a central role as a framework for the analysis of organisation-level competitive strengths and weaknesses (Stabell and Fjeldstad 1998). The organisation must perform one or more value creating activities in a way that creates more overall value than do their competitors. Porter argues that the ability to perform particular activities and to manage the linkages between these activities is a source of competitive advantage (Recklies 2001d).

These value-creating activities are divided between Primary Value Chain Activities and Support Activities. The goals of the primary activities are to create value that exceeds the cost of providing the product or service, thus generating a profit margin. The primary value chain activities are facilitated by support activities. Support activities are often viewed as "overhead", but some organisations have successfully used them to develop a competitive advantage, for example, to develop cost

advantage through innovative management of information systems. The basic model of Porter's Value Chain is summarised in figure 2.3 below:

Figure 2.3 - Porter's Value Chain



(Adapted from Recklies 2001d)

The organisation's value chain links to the value chains of upstream suppliers and downstream buyers. The result is a large stream of activities known as the value system. The development of a competitive advantage depends not only on the organisation-specific value chain, but also on the value system of which the organisation is part (Recklies 2001d, Internet Centre for Management and Business Administration 2002b). "IT can profoundly affect one or more of these value activities, sometimes simply by improving effectiveness, sometimes by fundamentally changing the activity, and sometimes by altering the relationship between activities" (Applegate et al 1999). A systematic examination of an organisation's value system can be an effective way to search for profitable IT applications. Table 2.1 summarises the way IT can facilitate activities within the value creating activities, and also provide a broad model for ERP implementation and functionality.

Table 2.2 - Role of IT in the Value Chain

Inbound Logistics • IT expedites procurement of materials • Need to maintain inventory safety stocks and associated holding costs can be reduced for both supplier and buyer • IT facilitates materials receiving, storing and distribution to manufacturing premises
Operations and Product Definition • IT can influence manufacturer's operations and response times by reducing order response times • IT facilitates the transformation of inputs into finished products
Outbound Logistics • IT facilitates storing and distributing products
Marketing and Sales • IT facilitates promotion and sales force
Service • IT facilitates service to maintain or enhance product value
Corporate Infrastructure • IT facilitates support of entire value chain, such as general management, planning, finance, accounting, legal services, government affairs, and quality management
Human Resource Management • IT facilitates recruiting, hiring, training, and development
Technology Development • IT facilitates improving product and manufacturing process
Procurement • IT facilitates purchasing input

(Adapted from Applegate et al 1999)

It is important to note that the primary activity topology of the value chain appears well suited to describing and understanding a traditional manufacturing company, but

the topology and underlying value creation logic are less suitable to the analysis of activities in a number of service industries. According to Stabell and Fjeldstad (1998 p. 414), "the value chain models the activities of a long-linked technology, while the value shop models organisations where value is created by mobilising resources and activities to resolve a particular customer problem, and the value network models organisations that create value by facilitating a network relationship between their customers using a mediating technology." Value chain activities must therefore be transformed into value configuration analysis.

The value system should therefore not only be seen as a chain of sequential links. Other role players will have different views of their value systems. In the value chain, transformation of inputs into products is the distinctive value creation technology, while for the shop value configuration, it is about resolving or solving customers' problems, and for the network value configuration, linking customers creates value. "Supply chain done right is a value chain. It's an integrated supply and demand chain or an integrated value chain. When you think about it that way, you use it to drive revenues and innovation and create value – not just to reduce cost. And that's where you start to get strategic advantage" (Supply Chain Challenges: Building Relationships 2003, p. 73).

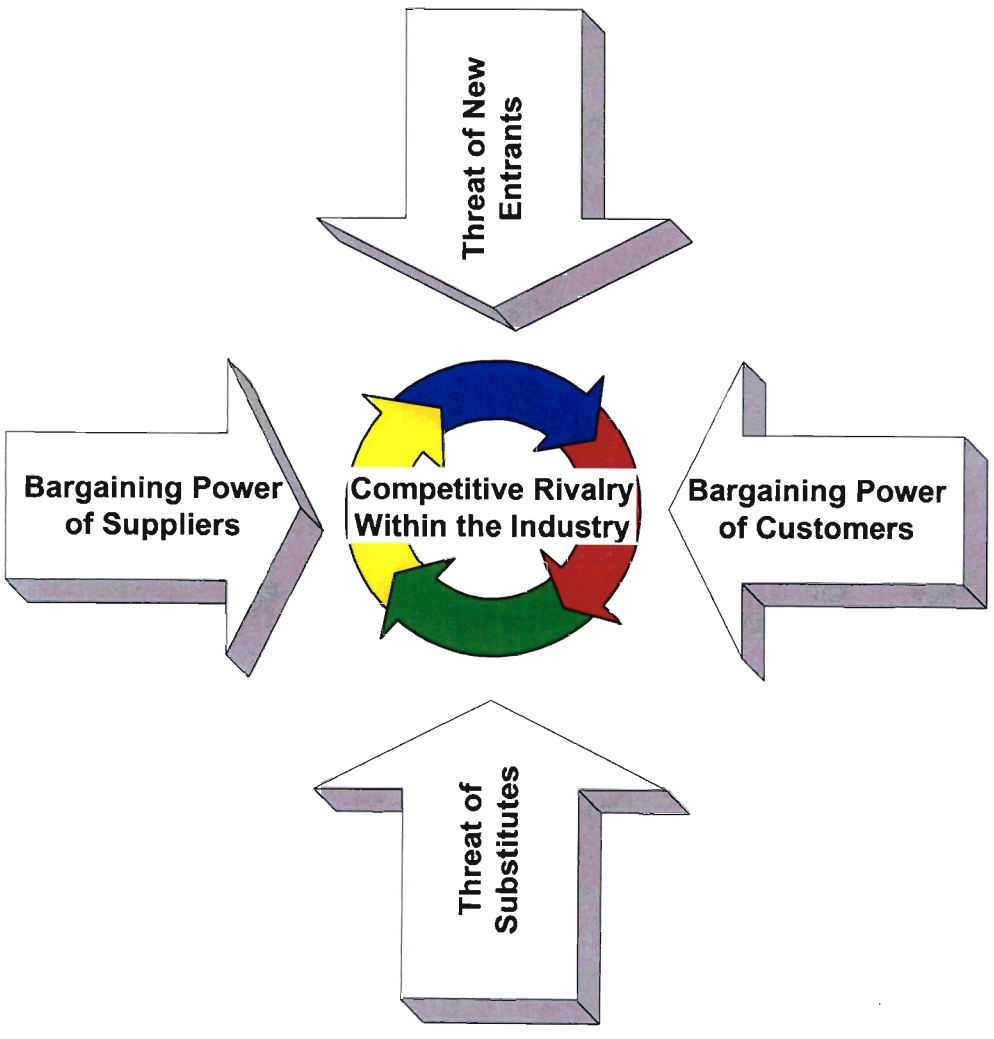
2.6 External Analysis for Information Technology Opportunities

The elements of internal analysis alone will not determine if an organisation will achieve sustainable competitive advantage. The organisation can align and configure its internal processes to its strategy, but this strategy also has to deal with the external environment in which the organisation competes. One of the most influential models for analysing an organisation's position in its competitive environment was developed by Michael E. Porter. Porter had a lasting influence on strategic management with his books about competitive advantages on industry levels and global levels. Even though these ideas were developed in the eighties, it does not mean that his theories and models became obsolete. His models and ideas are based on economic insights to the management problem. These economic insights are the basis for the sustainability of Porter's ideas. Important however is that these models, as with any other business model, old or new, should be applied with their limitations in mind and then be used

as part of a larger framework of management tools, techniques and theories (Recklies 2001a).

Porter's five forces model is based on the idea that a corporate strategy should meet the opportunities and threats in the organisation's external environment. He has identified five competitive forces that shape every industry and every market. They determine the intensity of competition and hence the profitability and attractiveness of an industry. The objective of corporate strategy should be to modify these competitive forces in a way that improves the position of the organisation. Figure 2.4 represents the way these forces determine how economic value created by any product, service, technology, or way of competing, is divided between companies in an industry on the one hand and customers, suppliers, distributors, substitutes and potential new entrants on the other hand.

Figure 2.4 - Porter's Five Forces Model



Porter's five forces model has endured much criticism during recent years. These criticisms stem from the fact that Porter's theories are based on the economic situation in the eighties, a period characterised by strong competition, cyclical developments, and relatively stable market structures. Downes (1997) states, "The problem is that three New Forces – digitalisation, globalisation, and deregulation – are overwhelming the traditional five. The New Forces, whose effect can be seen most visibly in the movement of business activities from the physical world to the world of the global computer networks like the Internet, require a new strategic framework and a set of very different analytic and business design tools... No doubt the foremost difference between strategy in the Porter world and in the world of the New Forces is in the role of information technology." Downs further emphasises that technology (IT) has become the essential disrupter of markets and operating models.

Porter (2003) responds to criticism in his article on Strategy and the Internet, by stating that the Internet (and Information Technology) should be regarded as an enabling technology. It is a powerful set of tools that can be used, wisely or unwisely, in almost any strategy. Recklies (2001a) argues further that organisations still operate in the framework of the Five Forces, based on the microeconomic environment they operate in. Down's New Forces only made this framework more instable, dynamic and complex. Table 2.3 relays Porter's Five Forces to areas of microeconomics:

Table 2.3 - Porter's Five Forces and Microeconomics

Porter's Five Forces	Areas of Microeconomics
Bargaining Power of Suppliers	Supply and demand theory, cost and production theory, price elasticity
Bargaining Power of Customers	Supply and demand theory, customer behaviour, price elasticity
Rivalry Between Existing Players	Market structures, number of players, market size and growth rates
Threats of Substitutes	Substitution effect
Threat of New Entrants	Market entry barriers
Industry Attractiveness	Profitability, supernormal profits

(Recklies 2001a)

Microeconomic theory has stood the test of time and their validity, even today, cannot be disputed. The five forces are therefore still valid and should be taken note of in strategy formulation.

The internal analysis of the resources and capabilities of a organisation, and the external analysis of the environment a organisation operates in, are essential in order to leverage opportunities where information technology can play an important role in order for the organisation to develop strategic options.

Different views exist of the role IT can (and should) play in the strategy of an organisation as well as the impact it has on achieving sustainable competitive advantage. ERP systems as noted earlier, attempts to integrate all departments and functions across a company to create a single software program that runs off one database. It should thus be possible for each business process and transaction to have complete information available of the organisations' business processes and transactions. As an example, the business process of order fulfilment involves taking an order from a customer, shipping it and billing for the order. With ERP, when a customer service representative takes an order, he or she has all the necessary

information – the customer's credit rating and order history, the company's inventory levels and the shipping doc's tracking schedule. Every one 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 determine the status of the order, one only needs to log into the system (Koch 2001).

Typically, ERP systems claim to streamline business processes through integration, reduce inventory holding through just-in-time models for stock holding, streamlining the value chain through allowing integration with supplier systems and allowing customers access to the ordering system, and by allowing quality improvements in the business processes. Prior to implementing and even after an implementation of the chosen ERP system, it is necessary to evaluate if the ERP system is living up to what was promised. Strategy cannot be formulated or adjusted to a changing environment without a continuous process of evaluation. Strategy evaluation therefore forms an essential step in the process of guiding the organisation towards sustainable competitive advantage, and is a necessary step in order to gain confidence in the strategy implementation.

2.7 Techniques in the Evaluation of Strategy

For many executives, receiving positive answers to measuring an organisation's performance based on historic results is enough to believe that the chosen strategy is working. Although this seems a reasonable argument, it does miss the point of strategy. Rumelt (1999, p. 52) states, "that the critical factors determining the quality of current results are often not directly observable or simply measured, and that by the time strategic opportunities or threats do directly affect operating results, it may well be too late for an effective response." In order to evaluate strategy effectively, evaluation techniques need to be applied against criteria that are relevant to the organisation. Johnson and Scholes (1998) name three types of evaluation criterion that can be used to assess strategies. The three evaluation criteria they proposed are that of suitability, acceptability and feasibility. Figure 2.1 – Traditional strategic planning and its limitations, shows the position for each evaluation criterion in the

traditional strategic planning framework. These criteria are not set in stone and should not be seen as the only ones available.

2.7.1 Analysing Acceptability

Acceptability is concerned with the expected performance outcomes, such as return or risk, should the strategy be implemented. The expected performance outcomes should be in line with the expectations of stakeholders, such as the shareholders, employees and management. Lynch (2000, p. 623) stated that certain questions should be asked and considered in the context of the evaluation criteria, like:

a) Will the strategy option have high and unacceptable levels of financial risk and how will the shareholders react?

b) Does the option involve an increase or reduction in employment levels?

c) Will there be a need for management to be recruited or made redundant?

d) Are there any broader community issues such as environmental 'green' issues that can make the strategy unattractive to local or national citizens?

e) What is the likely government response to the new proposals?

Johnson and Scholes (1998) identify three broad approaches to assessing acceptability, namely, analysing return, risk, and stakeholders' reactions. Table 2.4 summarises the assessment of acceptability of strategies:

Table 2.4 - Assessing the Acceptability of Strategies

APPROACH	USED TO ASSESS	EXAMPLES	LIMITATIONS
Analysing Return			
Profitability Analysis	Financial return of investments	Return on capital Payback period Discounted cash flow (DCF)	Apply to discreet projects Only tangible costs/ benefits
Cost-Benefit Analysis	Wider costs/benefits (including intangibles)	Major infrastructure projects	Difficulties of quantification
Shareholder Value Analysis (SVA)	Impact of new strategies on shareholder value	Mergers / takeovers	Technical detail often difficult
Analysing Risk			
Financial Ratio Projections	Robustness of strategy	Break-even analysis Impact on gearing and liquidity	
Sensitivity Analysis	Test assumptions/ robustness	"What if?" analysis	Tests factors separately
Simulation Modelling	Aggregate impact on many factors	Comprehensive models Risk analysis	Quality of data on causal relationships
Stakeholder Reactions			
	Political dimension of strategy	Stakeholder mapping Game theory	Largely qualitative

(Johnson and Scholes 1998, p. 371)

While acceptability deals with the expected reaction of stakeholders, the evaluation criterion of feasibility deals mainly with internal analysis and the analysis of resources and capabilities of the organisation. Suitability on the other hand mainly addresses the issue of external analysis.

2.7.2 Analysing Feasibility

Feasibility is concerned with whether the strategy could be made to work in practice. Assessing feasibility is often quantitative in nature and requires an emphasis on detailed assessment of the resources and capabilities of the organisation. This analysis is therefore concerned with whether an organisation has the resources and

competencies to enhance strengths and overcome weaknesses in order to deliver a strategy. Even consistent options could lack feasibility in three areas (Lynch 2000, p.619):

a) Culture, skills and resources internal to the organisation,

b) Competitive reaction and other matters external to the organisation,

c) Lack of commitment from managers and employees.

These three areas should be kept in mind when assessing the feasibility of strategy or strategic options. Johnson and Scholes (1998) list three analytical approaches that can be used to assess internal feasibility:

a) Funds flow analysis forecasts the funds that would be required for strategy option or chosen strategy, and the likely sources of those funds.

b) Break-even analysis is used to quantify some of the key factors that would determine the success or failure of a strategy. This analysis could be used in parallel with assessment of acceptability.

c) Resource deployment analysis is used as a wider assessment of the resources and competencies of the organisation in relation to specific strategies. It is a way of comparing options with each other in a framework for easy analysis by management. The requirements of alternative future strategies should be laid out, indicating the key resources and competences for each strategy. "It should be remembered that the real benefit of such analysis is the identification of those necessary changes in resources and competences which are implied by any strategy, and an analysis of whether these changes are feasible in terms of scale, quality of resource or timescale of change" (Johnson and Scholes 1998, p. 386).

The three analytical approaches given are only examples of the application for the many tools and approaches that are available in order to analyse resources, capabilities and core competence of an organisation in order to evaluate the feasibility of a chosen strategy or strategic option. Exploring techniques of analysis and evaluation in strategic management by Ambrosini, Johnson and Scholes (1998) combined contributions from various sources and authors in order to establish a reference. Other approaches available in order to evaluate organisational resources and capabilities are to identify the organisation's core competence, value chain analysis, strategic financial accounting, benchmarking, and business process reengineering. This list is by no means complete, but it does highlight the various tools available and emphasises that there is no one correct formula or recipe that can provide all the answers. Insight in the way the business operates internally and in the external environment, combined with common sense would be the most valuable tool in the toolkit.

2.7.3 Assessing Suitability

Suitability is concerned with whether a strategy is addressing the circumstances in which the organisation is operating. According to Lynch (2000), some options might be more suitable to an organisation because they match the environment, resources, and they deliver competitive advantage in a superior way to other options. Suitability can be used to screen the identified or implemented strategic options before analyses that are more detailed are undertaken concerning acceptability and feasibility. Johnson and Scholes (1998) proposed that assessing suitability could be performed in two stages. The first stage is to establish the rationale for each strategic option in its own right, and second, establishing the relative merits of an option when a number of choices are available through processes of screening options for further evaluation.

When establishing the rationale for new strategy or a specific strategic choice, it can be useful to describe why a chosen option is a good idea. The answer to this question will consist of assessing the extent to which a strategy:

a) Exploit the opportunities in the environment and avoid the threats,

b) Capitalise on the organisation's strengths and core competences, and avoid or correct the weaknesses, and

c) Address the cultural and political context of the organisation.

Figure 2.5 summarises the different categories of analytical technique and the main contribution that they make in assessing the suitability of strategies. The five categories are:

a) ***Life cycle analysis***. Assesses whether a strategy is likely to be appropriate given the stage of the product life cycle. This could be combined with the relative strengths and weaknesses of the organisation in its market in order to create a lifecycle/portfolio matrix.

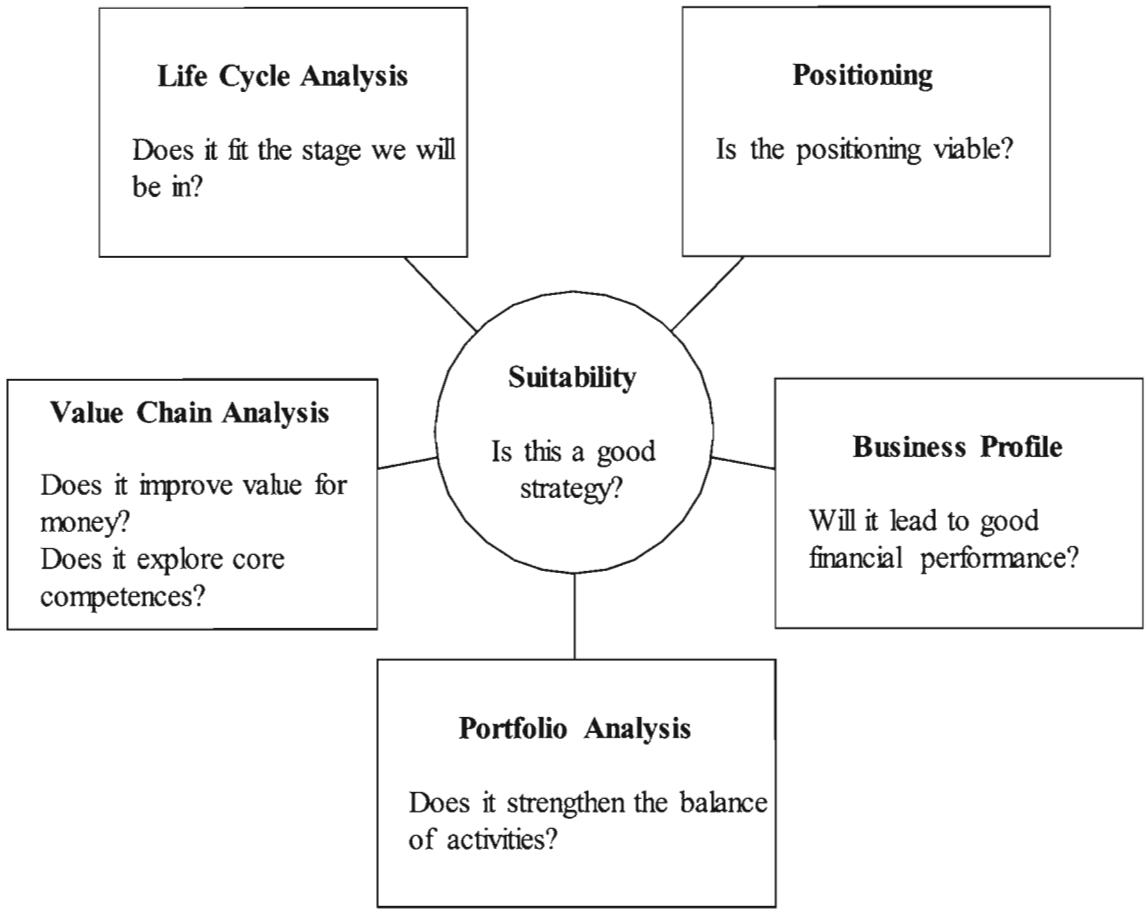
b) ***Positioning***. Assesses how an organisation is placed with regards to its competitors. This criterion is based on the choice of generic product and market strategies and forms the framework for constructing directions that are more detailed and methods of development.

c) ***Value chain analysis***. Describes the activities within and around an organisation and relates them to an analysis of the competitive strength of the organisation. The key to sustainable success can be found in the way the value system is configured as already discussed.

d) ***Portfolio analysis***. Analysis the balance of an organisation's strategic business units. This analysis could be used to evaluate specific options for the future and to highlight the long-term rationale of business development. These options and rationale can be plotted on a matrix, for example the Boston Consulting Group (BCG) matrix.

e) ***Business profile analysis***. Shows the extend to which a strategy matches the favourable performance parameters from published statistics and analyses like Profit Impact in Market Strategy (PIMS), published in the USA.

Figure 2.5 - Testing Suitability



(Johnson and Scholes 1998, p. 354)

2.8 Evaluating the Role and Impact of ERP

The evaluation process in the case for ERP implementation should ideally take place as part of the strategic planning process. The dimensions for both internal and external analysis of the organisation should be the framework in which the evaluation and choice is made. Traditional views look for best fit to the organisation – that is to support current and chosen strategies. However if the ERP choice and implementation design form part of the strategy formulation process, the implementation team will have a clear view of what is required in order to achieve strategic goals, and also how the ERP system needs to function in order to achieve these goals.

When evaluating and existing ERP installation and its role in the company, the strategic planning framework can perform either or both of the following functions:

a) Highlight what is required from the ERP system in order to support strategy and how it should add to competitive advantage. This can then form a guideline for changes required to the existing ERP installation (systems reengineering), or

b) A need for changing business processes, and how they should be adjusted or changed in order to leverage the ERP system in achieving competitive advantage, could be identified. This in turn could now initiate a project for business process reengineering (BPR).

Rumelt (1999) remarks on the evaluation of business strategy that, "strategy evaluation is an attempt to look beyond the obvious facts regarding the short-term health of a business and appraise instead those more fundamental factors and trends that govern success in the chosen field of endeavour." He concludes that the evaluation of current strategy cannot easily be separated from the normal planning, reporting, control, and reward systems of the organisation. It is a continuing organisational process.

Rumelt lists four broad criteria that encompass most of the tests that could be applied to evaluate business strategy. Strategy that cannot satisfy most or all of these criteria should be viewed as suspect. Table 2.5 lists the broad criteria for testing and assessing strategy.

Table 2.5 - Broad Criteria for Testing and Assessing Strategy

EVALUATION OF BUSINESS STRATEGY
1. ***Consistency***. A key function of strategy is to provide coherence to organisational action. The strategy must not present mutually inconsistent goals and policies, but should foster a climate of tacit coordination within the organisation.
2. ***Consonance***. The organisation must both match and be adapted to its changing environment and at the same time compete with other organisations that are also trying to adapt.
3. ***Advantage***. Competitive advantage stem either from superior resources, superior skills or superior position. Skills and resources represent the ability of an organisation to do more and/or do it better than its rivals.
4. ***Feasibility***. The strategy must neither overtax available resources, nor create unsolvable sub problems.

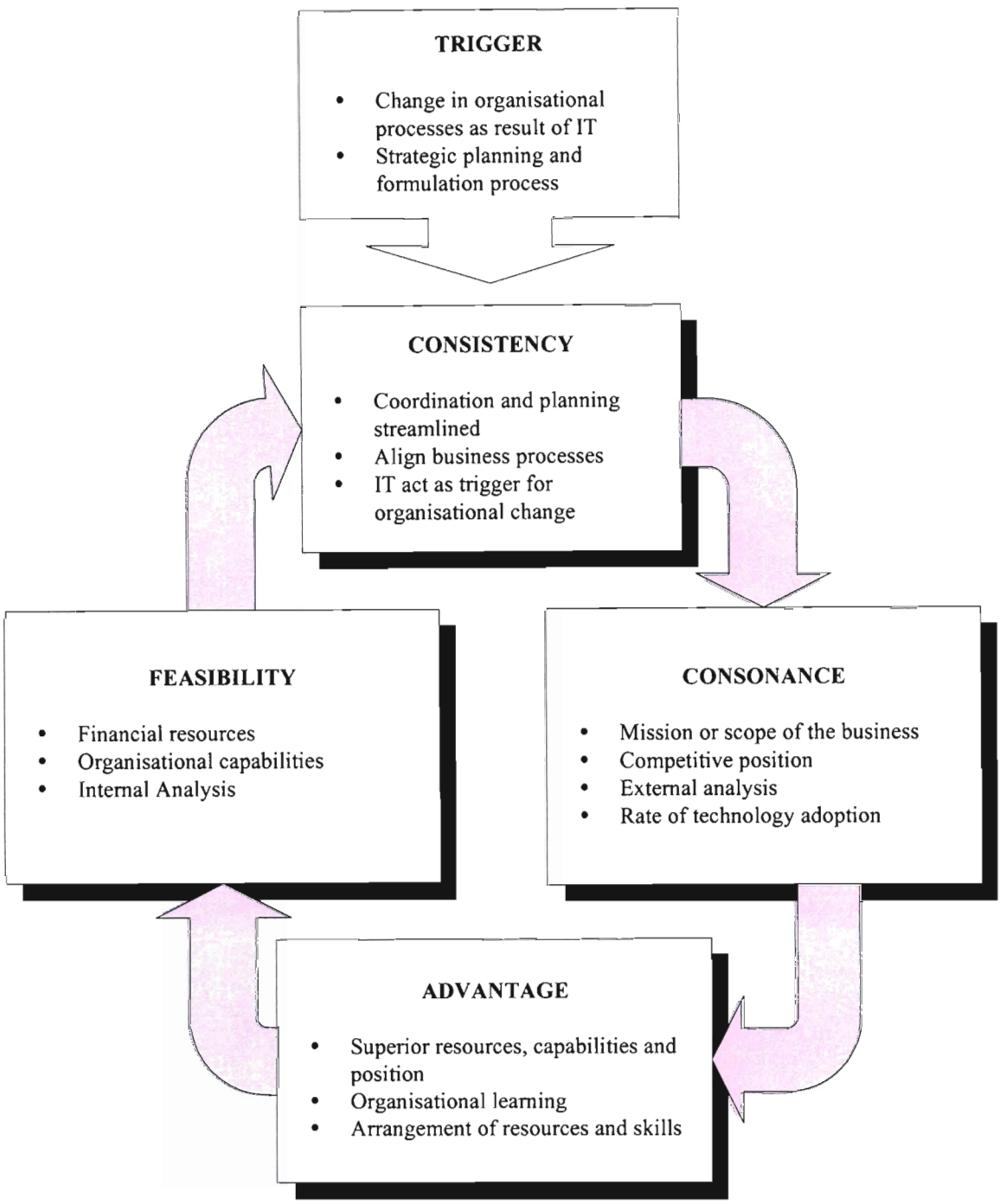
(Adapted from Rumelt 1999)

When evaluating the role of ERP in business strategy, the four broad criteria listed in table 2.5 can be applied to implementing ERP systems through a process of "reverse engineering". That is, ERP should be adapted to satisfy Rumelt's criteria and this should then in turn lead to a direct benefit for the organisation's strategic plans. In this scenario, strategy could provide the basis for the blueprint of ERP implementation. As part of the initial design process, the organisation should provide an answer to the question, "what must the ERP system provide in order to satisfy or support the four broad criteria of strategy that lead to competitive advantage?"

Figure 2.6 is a model that could be applied in evaluating the criteria or it could be applied during ERP implementation in order to answer the above question. This model can be used as a starting point in formulating the requirements and basis of the

ERP blueprint. Once these criteria are satisfied, analyses that are more detailed should be undertaken.

Figure 2.6 - Evaluation of Business Strategy



The trigger for the evaluation process would usually come from a review of strategy through the strategic planning process, as well as changes in organisational processes due to the role and impact of information technology. This trigger will be the starting

point for a cyclical process of evaluation that could adjust and readjust organisational strategy. As mentioned previously, evaluation is an ongoing process that helps an organisation to react to changes in its operating environment, both internally and externally. Without this adaptation, an organisation will lose its competitive advantage rapidly.

2.8.1 Evaluate the Impact of ERP for Consistency

The very nature of an ERP system is to streamline and coordinate an organisation's business processes. As long as these business processes are implemented correctly in the ERP system in order to achieve the organisation's overall goals, coordination of activities will result (Ulrich 2003, Koch 2001). A key function of strategy is to provide coherence in organisational action that can foster a climate of tacit coordination. Evaluating the criteria for consistency could also highlight shortcomings in the business processes through the failure of the process. Corrective action can be taken immediately in order to rectify the inconsistencies.

Organisational conflict is often an indication that strategic inconsistency exists, especially if changes in personnel do not seem to resolve the problem. Problems with coordinating and planning will be mostly issues based, rather than people based. ERP systems tend to formalise these processes if they are transferred to the enterprise system. Through the process of determining the blueprint, the issues will have to be addressed and should be resolved in order to satisfy all requirements, especially if this effort is directed by organisational goals.

If the success for one business unit or department result in, or is interpreted to mean failure for another department, the basic objective structure is inconsistent. This could lead to serious flaws in the design and implementation of an ERP system. Due to the integrated nature of the system however, IT should act as a trigger for organisational change.

Consistency must also exist between organisational objectives and the values of the management group. Inconsistencies in this area are a problem in strategy formulation, and thus corrupting the trigger for organisational change. Resolution of the conflict

might result in adjustment in the competitive strategy, as well as a need to change processes. If implementation of ERP results in a trigger for change in management values with resultant change in strategic direction, system reengineering will most likely be required. Failure to do so will result in frustration with a system that is geared for a different strategic direction.

2.8.2 Evaluate the Impact of ERP for Consonance

An organisation relates to its environment in two basic ways: the organisation must both match and be adapted to its environment, and it must at the same time compete with other firms that are also trying to adapt. The first aspect of fit deals with the basic mission or scope of the organisation, while the second aspect deals with its special competitive position in the external environment. Consonance, or matching, deals mainly with the basic pattern of economic relationships that characterise the organisation and determine whether or not sufficient value is being created to sustain the strategy. The key to evaluating consonance is an understanding of why the business, as it currently stands, exists at all and how it assumed its current pattern.

ERP implementation in a firm may not be related directly to consonance, but how the organisation adapts to a changing environment usually determine the adoption of new technologies. The extent to which an organisation will adopt technology, or change existing technology, will depend on the need to change within and the position of the organisation in the market: are they leading or are they following?

2.8.3 Evaluate the Impact of ERP for Advantage

Competitive strategy is the art of creating or exploring those advantages that are most telling, enduring, and most difficult to duplicate. Competitive strategy focuses on differences among firms and addresses the problem of "how can we perform it either better than, or instead of our rivals?" Competitive advantage normally consists of at least one of superior resources, superior skills, or superior position. Superior resources and skills represent the ability of an organisation to do more and/or to do it better than its rivals do. The analytical issue is to determine which skills and resources represent advantages in which competitive areas.

As seen already, all organisations in a competitive environment have equal access to "ready made" ERP systems. These systems are already adapted for major industries and therefore remove the incentive for organisation's to develop own systems that could be distinctly different. ERP systems do offer the opportunity to organisations for creating superior resource capabilities through the process of planning, configuring, testing and implementing. Most ERP systems are highly configurable in order to be modelled to fit an organisation's business processes. The challenge when implementing a chosen ERP system is to ensure that the business processes are effectively identified and implemented more efficiently than those of rivals implementing the same or similar ERP system, by utilising skills and resources in a superior way. Quality and time are dimensions that play a role in utilising resources, and the trade offs made between the three has a direct bearing on the end result.

At the core of the traditional notion of strategy lies the idea that certain arrangements of an organisation's resources and skills can enhance their combined effectiveness, and perhaps even put rival forces in a state of disarray (Rumelt 1999, p.56). Positional advantage is gained and is usually defensible due to the fact that it returns enough value to warrant its continued maintenance and would be so costly to capture that rivals are deterred from full-scale attacks on the core business. The continued use of legacy system or older enterprise systems could still be supported if the organisation believes, through analytical evidence, that these systems still add value and contribute to the organisation's overall position.

2.8.4 Evaluate the Impact of ERP for Feasibility

The quality-time-resource trade off impacts significantly on the criterion of feasibility. Satisfying this criterion requires that resources must not be overtaxed nor create unsolvable sub problems. Resources cannot be indefinitely tied up in an ERP implementation and therefore problems will have to be circumvented (or not addressed immediately), resulting in reduced quality that could lead to inherent problems in the business process. The financial resources of an organisation are the easiest to quantify and usually the first to test strategy against. Innovative approaches

to financing expansion can however both stretch the ultimate limitations and provide short term competitive advantage.

When implementing an ERP system, one of the less quantifiable limitations that play a role is that of individual and organisational capabilities. These consist mostly of the core competencies of the organisation. Mahen Tampoe defines core competence of an organisation as "the collective learning in the organisation, especially how to coordinate diverse production skills and integrate multiple streams of technologies" (Ambrosini, Johnson and Scholes 1998, p. 4). The enabling effect of the core competence will potentially result in competitive advantage in the implementation of an ERP system. The collective learning of the organisation increases during this process mainly due to the integrated nature of ERP. Three separate questions can be useful in order to assess the organisations ability to carry out a strategy or ERP implementation as listed in table 2.6, and although these deal with strategy, the questions are just as relevant for an ERP implementation.

Table 2.6 - Assessing Feasibility of Executing Strategy

ASSESSING FEASIBILITY OF EXECUTING STRATEGY
1. ***Has the organisation demonstrated that it possesses the problem solving abilities and/or special competences required by the strategy?*** A strategy does not and cannot specify in detail each action that must be carried out; its purpose is to provide structure to the general issue of the organisation's goals and approaches to coping with its environment. A strategy that requires tasks to be accomplished which falls outside the realm of available or easily obtainable skill and knowledge cannot be accepted.
2. ***Has the organisation demonstrated the degree of coordinative and integrative skill necessary to carry out the strategy?*** The key tasks required of a strategy not only require specialised skill, but also often make considerable demands on the organisation's ability to integrate disparate activities.
3. ***Does the strategy challenge and motivate key personnel and is it acceptable to those who must lend their support?*** The purpose of strategy is to effectively deploy the unique and distinctive resources of an enterprise. If key managers are unmoved by a strategy, not exited by its goals or methods, or strongly support an alternative, it fails in a major way.

(Adapted from Rumelt 1999)

2.8.5 Concluding the Evaluation

The very nature of an enterprise system thus supports the view that strategy is an organisational process. By bearing the broad evaluation criteria in mind, it is necessary for an ERP implementation to be part of the strategic processes of an organisation in order to ensure that the implemented strategic choice will lead to strategic advantage. The basic evaluation criteria describe conditions that should be met by implemented strategy or strategic action in order to support key business functions that are necessary for the survival of the organisation. Lynch (2000, p. 617) noted that "prescriptive strategy has taken the approach that a rational and fact based

analysis of the options will deliver the strategy that is most likely to be successful: logic and evidence are paramount in choosing between the options."

2.9 Summary

One of the most important steps in the strategic process of an organisation, after arriving at various options, is the evaluation process. This is the step that will provide an organisation with the necessary evidence for implementing a strategy that should provide sustainable competitive advantage. IT should be considered as part of the options to be evaluated. Through ERP, an organisation has a resource that should be managed, and through the nature of this resource, certain capabilities can be created, that when combined, may provide distinctive competencies.

The evaluation process is not just applicable to new strategic options, but can also be applied to choices already made and implemented. The process can therefore provide an organisation with either confidence that a chosen strategy or strategic direction is working, or that certain changes need to be made. The evaluation process will not just highlight areas that should change, but also to what extent they should change. The model developed for evaluation will be applied to a case study on Toyota South Africa, and their implementation of enterprise systems.

3 CHAPTER THREE

3.1 Background

Sine its start in 1937, Toyota Motor Corporation Co. Ltd (TMC) has grown over a period of sixty years to become the third largest automotive company in the world. It is by far the largest Japanese automotive manufacturer, producing more than 4.5 million vehicles per year. This extraordinary performance by Toyota Motor Corporation can mainly be attributed to the company's production systems. These systems have improved over the years since its start, and in the late 1950s, the "Toyota Production System" was established. This system is based on the principles of Jidoka, Just-in-Time (systems in which inventory items arrive when needed in the production process, instead of being stored in stock) and Kaizen (Japanese term for an organisation committed to continuous improvement), and is the major factor in reduction of inventories and defects in the plants of Toyota and its suppliers. The Toyota Production System underpins all the company's operations across the world.

Production of vehicles outside Japan began in 1959 at a small plant in Brazil, and continued with a growing network of overseas plants. Toyota Motor Corporation believes in localising its operations to provide customers with the products they need, where they need them. This philosophy builds mutually beneficial long-term relationships with local suppliers and helps the company fulfil its commitments to local labour. In every community in which the company operates, Toyota Motor Corporation strives to be a responsible corporate citizen, because close relationships with people and organisations in the local community are essential contributors to mutual prosperity. Across the world, Toyota participates enthusiastically in community activities ranging from sponsorship of educational and cultural programmes to international exchange and research.

Toyota South Africa leads the market with sales of their passenger vehicles, Corolla, Tazz and Hilux. Other models manufactured in South Africa are the Condor and Stallion range, the Hi-Ace range, and the Dyna truck. Models imported for distribution in South Africa, rather than being assembled in the country are Lexus, Camrey, MR2, Land Cruiser range, and the Prado and RAV4 range. Both ranges are

exported into Africa and the Corolla range is also exported to Australia as of January 2003.

3.2 Toyota in South Africa

Toyota began its South African operations through the initiatives of the late Dr Albert Wessels. In 1961, he obtained an import permit for 10 Toyopet Stout bakkies from Japan and a new business was started that would grow into a world-class competitor. Three years later the first Toyota shares were sold to the public while vehicle sales increased to 2 332 units. By 1968, Toyota became the largest producer of commercial vehicles in South Africa and was chosen as "Company of the Year" by the financial press. Motor Assemblies was enlarged at a cost of R8 million and in 1972 and in 1979, Toyota became the sole owner.

Toyota continued its impressive growth throughout the eighties, starting off in 1980 by becoming South Africa's market leader for total vehicle sales. In 1984, Dr Albert Wessels signed a long-term franchise agreement with Toyota Japan. At the start of the new decade, in 1990, Toyota South Africa celebrated its tenth year as market leader in the automotive industry. A year later, Dr Albert Wessels, Toyota South Africa's founder passed away and his son, Bert Wessels took over the family business as Executive Chairman.

Under the leadership of Bert Wessels, Toyota continued to grow, receiving numerous industry awards in the 1990s. In 1997, Toyota set a new sales record in South Africa for number of vehicle sold in a year, a record that was held by the company, previously set in 1984. This achievement followed a period where Toyota vehicles dominated the South African rally championships and numerous other standard production and modified racing championships, including off-road racing championships. By the end of the decade, Toyota had 20 years as overall leader in the South African vehicle market. In 2000, the company celebrated its 21st year as overall market leader with a 23.3 percent market share of the total vehicle sales in South Africa.

Toyota products continued to occupy the top three positions on the sales charts in 2000. The new millennium started a new era for Toyota South Africa. Bert Wessels, Toyota South Africa's Executive Chairman, passed away on 2 December 2002. In the place of Bert Wessels, Dr Johan van Zyl is appointed as President and CEO of Toyota South Africa, and Bert Wessels' sister, Mrs. Elisabeth Bradley, is appointed as the new Chairman for the company (adapted from Toyota's history 2003). Dr van Zyl commented, "The future growth of our company depends on us being leaders rather than followers. We cannot rest on the laurels of market leadership – we must develop exciting new initiatives to keep the Toyota brand in the forefront of a significantly changing market" (Toyota News October 2002).

3.3 Toyota South Africa's Performance

Earlier that year, in July 2002, Toyota Motor Corporation increased its holding in Toyota South Africa from 35.7 percent to 74.9 percent with the purchase of shares from Wesco Investments, the listed investment vehicle of the Wessels family, for R1 billion. Toyota Motor Corporation now holds the majority share in Toyota South Africa, while Wesco will retain a 25 percent shareholding and will participate in future capital investment as a minority partner.

"This controlling shareholding in Toyota South Africa signifies a strengthening of our commitment to South Africa and our intention of growing our business in this region," said Mr. Yoshio Ishizaka, Executive Vice-President of Toyota Motor Corporation. He further remarked, "Since the mid 1990s South Africa has been engulfed in a wave of rapid globalisation led by the motor industry. Toyota South Africa is now set to fully embrace this process of globalisation and become a significant exporter of fully build up vehicles, starting with the building of the new Corolla for the Australian market early in 2003" (Toyota strengthens SA position 2002). Toyota South Africa also announced that it is to become the global supplier for new vehicle projects, including pick-up trucks, multipurpose vehicles and major vehicle components from 2005. Toyota South Africa's manufacturing plant in Prospecton is also gearing itself to more than double its 2001 production output to a level of 150 000 units by 2007.

At the end of the financial year for 2002, Toyota South Africa increased its turnover from R8.4 billion in 2001 to R10.7 billion in 2002, a 27.8 percent increase. The company gained marginal improvement in its overall market share of 22,6 percent in 2001 to 23,1 percent in 2002 even though new vehicle sales fell from 83 059 units sold in 2001 to 80 777 units sold for 2002. Despite these improvements, Toyota South Africa had a R126 million loss for the 2002 financial year. Toyota South Africa's CEO, Johan van Zyl, explained that the company's lack of profitability in the 2002 financial year was expected, and was largely due to the weakness of the South African Rand. "Although we put up our prices, we could not catch up with the deteriorating currency, not just last year (2002), but in previous years. However, the recovery of the Rand towards the end of last year helped, and if things continue as they are, we will return to profitability this year (2003)" (Fraser 2003). Table 3.1 shows some key financial and performance figures for Toyota South Africa.

Table 3.1 - Selected Performance Indicators for Toyota SA

	2002	**2001**	**2000**	**1999**
Turnover	R10.7 billion	R8.4 billion	R7.7 billion	R6 billion
Market Share	23,1%	22,6%	23,3%	24,5%
New vehicle sales	80 777 units	83 059 units	81 503 units	74 431 units
Operating Profit / (Loss)	(R126 million)		(R22.8 million)	R42.8 million

(Source: Compiled from various Internet sources)

Table 3.2 is a summary of the sales performance in 2002 for the top three Toyota models. The 2003 sales results are largely due to the new Corolla range that was launched at end of 2002 while the new RunX was launched at the beginning of 2003, by boosting the sales for this year.

Table 3.2 - Passenger Vehicle Sales for Toyota SA (2002)

Model	Number of units sold 2002
Tazz	23 336
Hilux	22 348
Corolla	17 547

(Source: http://www.toyota.co.za/more/new_article.asp)

By the end of July 2003, Toyota sales increased to 8 707 units sold for the month to secure a market share of 25.6 percent. The National Association of Automobile Manufacturers of South Africa (NAAMSA) vehicle sales statistics for July 2003 show a continued high level of interest from buyers with monthly sales at the highest since November 1996. The following two tables list the July 2003 position in the overall market for Toyota South Africa. The Corolla and Run, together with the Tazz and Hilux ranges, hold the top three positions on the overall sales charts for new passenger vehicle sales. Table 3.3 shows Toyota's market dominance in three key market segments as listed. The company sold more vehicles than any other competitor in these three market segments.

Table 3.3 - Passenger Vehicle Sales for Toyota SA (July 2003)

Vehicle Model	Number of units sold
Corolla and Run	2 799
Tazz	2 093
Hilux	2 033

(Source: http://www.toyota.co.za/more/new_article.asp)

Table 3.4 - Share of Key Market Segments for Toyota SA (July 2003)

Market Segment Sales	Market Share
Passenger Vehicle	24.9%
Light Commercial Vehicle	28.8%
Medium Commercial (Especially the Dyna range)	36.0%

(Source: http://www.toyota.co.za/more/new_article.asp)

3.4 Information Technology Choices

During the most part of Toyota South Africa's phenomenal growth, IT has played an ever-increasing role. By the mid 1990s, the company started to realise that their mainframe systems were becoming outdated. With the looming year 2000 scare, a choice was made to implement an ERP system that will replace the plethora of old mainframe and other systems in the manufacturing divisions in order to take Toyota South Africa into the new millennium. The existing systems were outdated, not year 2000 compliant, did not provide timely business and financial information, and could not carry out appropriate customer satisfaction activities.

"Toyota South Africa's vision of world class competitiveness, an increased market share and production improvement were the prime motivators behind the automotive company's decision to implement world leading enterprise business software solution, SAP R/3" (Toyota SA on the world class route 1998). With South Africa's reacceptance as a member of the global economy, the motor industry has realised that information architecture, along with sound strategies, customer focused people and competitive products, is vital to their industry and to any organisation. When an organisation looks at growth opportunities in the global market this becomes even more important due to the fact that both responsiveness and execution excellence is required.

Toyota South Africa's corporate philosophy advocates the "quality rather than quantity" approach, and this formed the basis of the company's decision to move from a "make-to-stock" manufacturing and distribution philosophy to a "make-to-order" environment. The SAP R/3 ERP system will form a vital component of this move.

Peter Truscott, the infrastructure project manager at Toyota South Africa stated "Customer satisfaction is also a critical focus at Toyota – for us this involves all our customers, both our vehicle owners and the dealers. Currently (1998), dealers are given three months to forecast, but at that stage, they don't really know who the customer is and when they will buy. Through R/3 and managing our supply chain, we are planning to reduce this cycle time considerably. The results will be a customer

demands driven operation as opposed to a forecast business. As part of the extended supply chain management, we will be utilising technologies such as the Internet for activities including direct client ordering. Looking at the future, we may create a virtual reality sales booth."

The project to implement SAP at Toyota South Africa is called project ENTREPIT, short for "ENTerprise REsource Planning In Toyota", and has a direct correlation to the English word intrepid. The implementation of the SAP modules consisted of various phases, with phase one being the roll out of the financials, purchasing and stock control of non-OEM stock at the company's offices in Johannesburg and Durban. This will be followed by the implementation of various other modules, in particular the sales and distribution, production planning, materials management (including warehouse management), and personnel development modules. This "wall-to-wall" implementation of SAP was originally planned to run over a three-year period, starting in 1998. Due to the complexity of the project however, the original implementation plans had to be revised and the final phase for the manufacturing division will only be implemented by the end of 2003.

3.5 SAP Success at TSP

The Toyota Parts and Accessories Division (TSP) of Toyota South Africa were already running SAP R/3 with start of project ENTREPIT. The primary benefits realised by using SAP in the division are improved control of the business, including stock and all the processes. The implementation of SAP in TSP followed a productivity improvement drive within the company in 1992. SAP R/3 was implemented in 1996 with the modules of materials management, warehouse management, sales and distribution, and finance. This paid off and in 1999, the company won a Gold Award (Corporate Category) in the National Productivity Awards, organised by the National Productivity Institute. Toyota SA also won a Special Award for continuous improvement in the 1999 Logistics Achiever Awards, organised by the influential Logistics News publication.

One of the most important objectives of the company's improvement drive was to reduce the levels of inventory held at the various stages in the industry supply chain,

while achieving high levels of customer satisfaction. This required a team effort from all levels of the workforce, many changes in traditional practices, and a sophisticated computer system to provide the backbone for the new look work processes. "SAP R/3 has resulted in vast quality improvements and brought much more discipline to the environment," says Piet van Wyk de Vries, executive sponsor for TSP's SAP project, and After Sales Director of Toyota SA Motors (PTY) Ltd.

The company is now reaping the real, quantifiable business benefits of a sophisticated system that demands discipline from its users. SAP R/3 provides TSP with a true picture of its business. There is no longer any room for "creativity" by staff, who in the past could message the figures. "R/3 has given us more control over the business than ever before. We know exactly what the supply rate is each day, and what our sales were yesterday. We can, for example, measure the performance of individual inventory controllers to a far better extent than before", says Chris Baker, SAP Project manager at TSP, and General Manager Inventory and Database Control.

"We can also now more accurately measure the performance of our suppliers. We are looking at timely deliveries and the support rate of the range of parts we buy from them. We also have much better control over our inventory. R/3 is controlling our entire stock, including the half that comes from Japan and Europe. We now hold less than four months stock and have accurate inventory records. We keep stock based on demand. If a dealer needs a non-stock item, we locate it by importing it or having it made. We keep 80 000 different material numbers in stock, out of a total population of around 160 000. We can supply better than 94 percent of demand off the shelf, and the rest we get within a couple of weeks. Our investment in stock is currently R100 million," he says.

"TSP is now starting to achieve its longer term objectives," says van Wyk de Vries. "Our vision is to be among the top 10 Toyota distributors in the world and to continuously increase return on investment for TSP. We want to assure availability of more than 97 percent of parts within 24 hours anywhere within our territory in order to maximise our market share. SAP has given us functionality that works. As our people became used to it, they made it theirs, and now achieving their job objectives with the system. It has given the company more stability, and created a platform from

which we have been able to implement organisational and process changes. We now have a solid foundation on which to achieve the objectives we have set ourselves" (ERP system behind Toyota SA productivity & improvement awards win 2000).

3.6 Other Achievements for Toyota South Africa

It is not just TSP that excels wit rewards and achievements, but also Toyota South Africa. The Competitive Customer Satisfaction Index (CCSI) survey of the motor industry, done by Proactive Insight, for the period July 2001 to June 2002, shows that Toyota South Africa is the clear leader in achieving overall customer satisfaction in the light commercial vehicle sector. Toyota and its dealers were measured as providing the best purchasing and service experience in this important market segment. In the passenger vehicle segment, Toyota came second with 90,6 percent to the 91,0 percent achieved by Chrysler. Toyota's strong performance in the passenger vehicle segment and its clear lead in the light commercial sector, is an indication of the company's dedication to achieving the highest levels of customer satisfaction.

Dr van Zyl stated, "Customer satisfaction is ingrained in our corporate philosophy and is actively managed within the company. It is our objective to have Toyota lead the way in terms of total satisfaction in the overall ownership experience associated with our products. This is a Toyota core value that extends from the purchasing experience right through to the time that the vehicle is sold on to a second owner, when we expect the used car ownership experience to continue to provide high levels of satisfaction" (http://www.toyota.co.za/more).

This level of customer satisfaction is also reflected in the market research conducted by Markinor for the 2002 Sunday Times Top Brands Survey. Branding is defined by Lynch (2000) as, "the additional reassurance provided to the customer by the brand name and reputation beyond the intrinsic value of the assets purchased by the customer." Toyota's overall brand relationship score in the "cars" category was 32 percent, compared to 25 percent for BMW, 18 percent for Mercedes Benz, and 13 percent for Volkwagen. The overall brand relationships consists top-of-mind awareness, trust and confidence, and loyalty. Toyota is also the only car company in

the top ten overall ranking of "most admired", for companies operating in South Africa, and gained eighth place. The results are displayed in the following tables.

Table 3.5 - Overall Brand Relationship Rankings in "Car" Category (2002)

Make of Car	Ranking
Toyota	32%
BMW	25%
Mercedes-Benz	18%
Volkswagen	13%
Mazda	10%
Ford	9%
Nissan/Datsun	6%
Honda	6%
Isuzu	6%
Opel	4%

(Source: http://www.toyota.co.za/more/new_article.asp)

Table 3.6 - Overall "Most Admired" Companies in South Africa (2002)

Company	Ranking
Coca-Cola	19%
Telkom	16%
Eskom	15%
SA Breweries	11%
Shoprite-Checkers	10%
Pick 'n Pay	9%
ABSA	8%
Toyota	7%
Standard Bank	7%
Vodacom	7%

(Source: http://www.toyota.co.za/more/new_article.asp)

3.7 Toyota South Africa's Vision and Mission

The Vision and mission statements of an organisation are positioned at the start of any good strategy process, and Toyota South Africa is no different. The following table shows Toyota South Africa's Vision and Mission statement. Toyota also released an environmental responsibility statement as seen in table 3.8.

Table 3.7 - Toyota South Africa Vision and Mission

Vision

Prosperity for all stakeholders through world competitiveness and continuous growth.

Common Values

Open and Honest Communication

Customer Satisfaction

Social Responsiveness

Quality in Everything we do

Respect for People and Property

Recognition and Reward for Effort

Teamwork

Fair and Equal Opportunities

Mission Statement

Toyota South Africa is dedicated to:

Supplying the range of vehicles, parts, accessories and services to meet the requirement of the South African and export markets that it services.

Ensuring that products are of outstanding quality, value for money and instil pride of ownership.

Developing and maintaining a dealer network which will provide superior service and excellence in customer care.

Fair and progressive employment practices and the development, in accordance with the Company's requirements, of the skills and potential of all its employees. The social, educational and economic development, where appropriate, of the communities in which it operates.

Keeping abreast of best practices relating to vehicle manufacturing, distribution and information technologies.

In meeting these requirements, Toyota South Africa has to generate sustainable returns on investments which will reward shareholders and secure funding for the Company's continued growth.

(Source: Toyota South Africa 2003)

Table 3.8 - Technology and the Environment at Toyota

THE TOYOTA EARTH CHARTER

Contribution toward a prosperous 21st century society. In order to contribute toward a prosperous 21st century society, aim for growth that is in harmony with the environment, and work to achieve zero emissions throughout all areas of business activities.

Pursuit of environmental technologies. Pursue all possibilities in environmental technologies and work on developing and establishing new technologies in order to enable the environment and economy to coexist

Voluntary actions. Develop a voluntary improvement plan that is based on complete prevention and compliance to laws and that also addresses environmental issues on the global, national, and regional scales, and promote continuous implementation.

Working in cooperation with society. Build close and cooperative relationships with governments, local municipalities, and a wide spectrum of people who are involved in environmental preservation, in addition to cooperating with related companies and related industries.

ENVIRONMENTAL POLICY: TOYOTA SA MANUFACTURING

Toyota SA Manufacturing accepts its responsibility to the environment and in the manufacturing of motor vehicles and parts is committed to:

Strive to comply with all applicable environmental policies, legislation, regulations, and other requirements to which Toyota SA subscribes.

Liaise closely with the relevant authorities and local environmental interest groups and maintain a policy of openness and cooperation with these bodies.

Prevent pollution through effective control measures and, where pollution may occur, take the necessary steps to prevent it from recurring.

Consider possible environmental impacts of its processes, activities or materials before implementation and to take effective measures to minimise these environmental impacts.

Reduce or prevent environmental impacts by setting and regularly reviewing environmental objectives and targets, which are supported by sustainable environmental management programmes in all relevant operations.

Promote environmental awareness amongst our employees and provide training to those employees involved in activities or processes, which may impact on the environment.

Keep the public, interested parties and our employees informed of our environmental performance, which is focused on continual improvement.

(Source: www.toyota.co.za 2003)

3.8 Summary

Toyota South Africa is a market leader in the automotive industry of South Africa. The company has a clear vision and its resources are being aligned with their mission statement. Through these efforts, Toyota has reaped the benefits, and their history is filled with various noteworthy achievements. These achievements are supported by the world class IT systems deployed, or in the process of being deployed, in order to support all divisions in the company.

Toyota South Africa has made the choice to implements SAP R/3, a world leader in the ERP field, as the basis for providing a business solution to the company. Various other enterprise systems are integrated with SAP in order to create a resource capability unique to Toyota South Africa. The completed phases of the enterprise system implementation, has already proven to be a source of value creation for the various divisions, leveraging opportunities throughout the value chain, from inbound logistics through to customer relationships and satisfaction. These facts will be placed in the framework of strategic evaluation in order to test against the theory of value creation. The question will be answered; does the use of ERP systems at Toyota South Africa create strategic advantage?

4 CHAPTER FOUR

4.1 Introduction

An organisation's strategy should be tailored to its resources, taking both strengths and weaknesses into account. A strong resources base should be build for the future and existing distinctive competencies must be maintained by the organisation. This can only be achieved by a continuous process of evaluation of the environment the organisation operates in, both internally to the organisation and the external environment it operates in. An organisation that utilises its resources and capabilities in a superior way can create competitive advantage that will ultimately result in value creation.

Information technology, as an enabling technology (Porter 2003), is a powerful tool, or more accurately, a set of tools. ERP is just one of these tool sets, and must be viewed as much more than a mere "computer system"; it is a business solution, a resource that is available to an organisation to help create superior capabilities that will lead to distinctive competencies.

4.2 Competitive Advantage

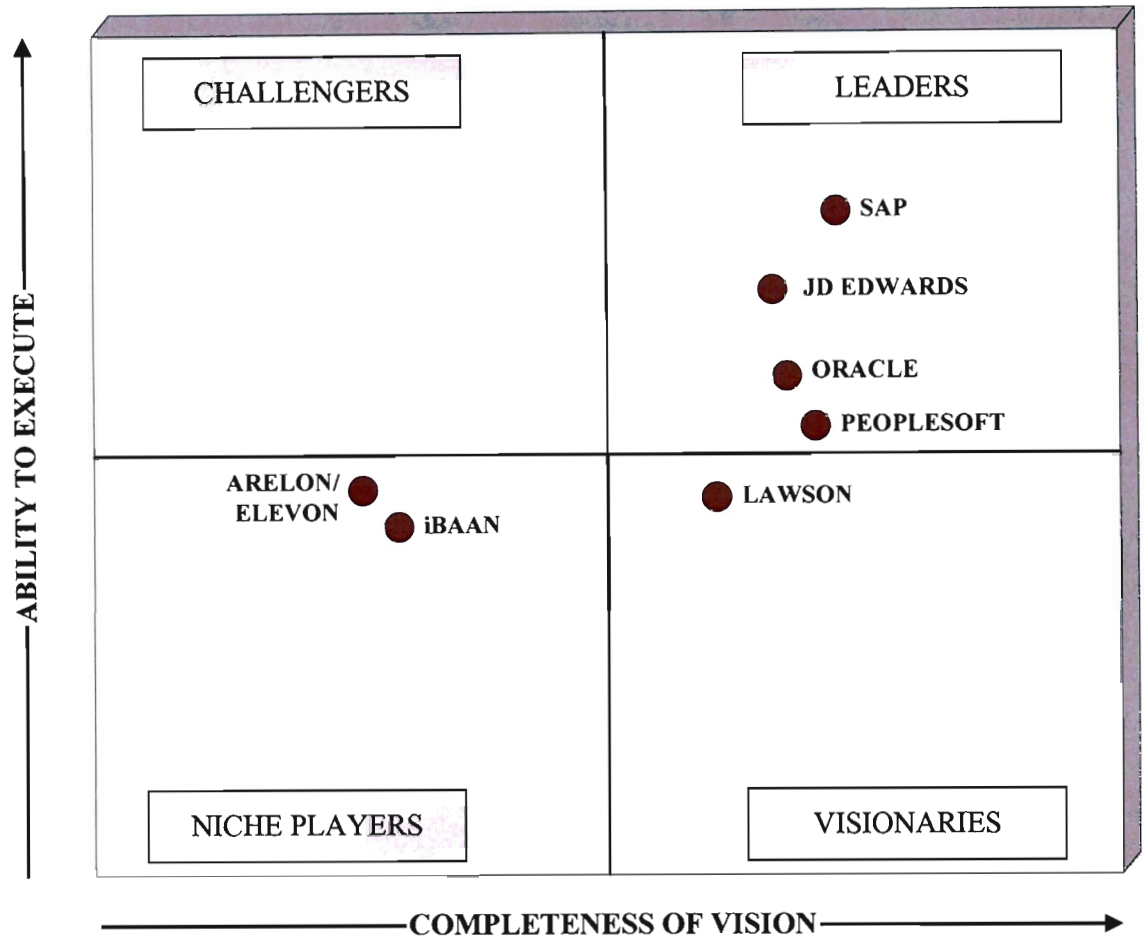
Before resources and capabilities can qualify as the basis for sustained competitive advantage, they have to pass four basic tests. These tests take the form of basic questions to which the answers will provide an indication of the value, or "strength" of a resource.

4.2.1 Hard to Copy Resources

Is the resource hard to copy? ERP systems are available to every organisation in an industry. All that is required to implement an ERP system is to make a choice on the system that will best suit an organisation's requirements. In a survey by Computerweek Strategist, seven of the most highly rated enterprise systems were evaluated. The result of this evaluation is summarise in table 4.1, and shows clearly that SAP is the market leader. These resources are not cheap, and the cost of implementation is high, but the result of a successful implementation is a resource

with capabilities that are hard to copy. Toyota South Africa thus made a choice for the market leader in ERP systems that allow established local support.

Figure 4.1 - Large Enterprise Resource Planning Magic Quadrant



(Language 2001, p.11)

The Parts and Accessories Division of Toyota South Africa (TSP) had a successful implementation of SAP, resulting the company winning a gold award in the National Productivity awards. SAP was working for TSP and this was a clear signal for the Manufacturing Divisions of Toyota South Africa that the implementation of SAP to replace their legacy systems, could result in superior benefits. The resource of TSP had to be copied, a task that has proven not to be as easy as it may have seemed initially. Currently, the implementation of the SAP manufacturing modules at the Durban Plant is still to be completed for the main assembly line. Numerous problems carried over from earlier phases of the implementation of SAP on selected assembly lines are still to be resolved.

4.2.2 Lifespan of the Resource

How long does the resource last? Potentially the biggest drawback of information technology is the rate at which today's "latest technology" becomes obsolete. Even though ERP systems try to establish their products as stable, change is inevitable. New technologies are utilised every day, and new products enter the market on a regular basis, products that become the standards for tomorrow, like the Internet and e-commerce. In order to realise the vision of ERP systems, to provide an integrated business solution of all business processes in an organisation, these new technologies have to be incorporated into the ERP solution. An organisation utilising a specific brand of ERP, are thus forced to upgrade their implementation to incorporate the latest developments in the system of their choice. The resource of the organisation must be maintained as well as the distinctive competencies they provide.

Since the implementation of SAP at TSP and the start of the implementation at Toyota South Africa's Durban and Johannesburg offices, various "upgrades" of the original implementation in both hardware and software had to be done. The company was also the pilot site for the world in implementing SAP's advanced planning and optimisation module together with the brand new custom module for the automotive industry.

4.2.3 Superiority of the Resource

Is the resource really competitively superior? Can the resource be trumped by the different resources/capabilities of rivals? Although the Toyota brand is highly recognised, and the company has the most popular vehicles in certain key market segments, as can be seen from the NAAMSA statistics, it does not necessarily mean that the ERP systems supporting the production of these vehicles are superior. Even more importantly, it must be born in mind that a lot of the capabilities that support the ERP system are tied up in the skills of individuals and in the knowledge that they possess.

These skills and organisational knowledge tend to get lost as the individuals move on in search of new challenges elsewhere, leaving the organisation vulnerable in the support of the ERP systems. SAP or ERP skills can easily be sourced from somewhere else, but the knowledge come at a price; time. Due to the extended duration of the implementation of the SAP system at Toyota South Africa's Durban and Johannesburg offices, a number of contract workers were employed for an extended period of time. A vast amount of knowledge transfer took place in order for the consultants to understand the business environment that SAP will be operating in, and over time, organisational learning took place as the ERP system was configured to match the requirements of the business. The process also gave employees new skills, increasing those capabilities of the organisation.

4.3 The role of IT in the Value Chain

Any organisation will use its distinctive competencies to compete in the industry they operate in. The organisation is also part of a larger value system. The value system offers numerous opportunities for IT, and more specific, the ERP system to leverage value chain activities and opportunities for profit creation. Toyota South Africa, being a manufacturing organisation, is a perfect match for the value chain model.

Evaluating the benefits achieved through the implementation of SAP at TSP, it is clear that opportunities in the value chain is being utilised. Inventory holding is cut down throughout the industry supply chain. Stock ordering and forecasting was done more effectively; the supply rate for each day is measured, and the sales for each day is known. Timely deliveries from suppliers can be maintained accurately. All these benefits are also available for the manufacturing divisions once all legacy systems are converted over to SAP.

Toyota South Africa is primarily customer focused through customer satisfaction improvements as can be seen from the CCSI survey. This is a clear indication that the marketing and sales, as well as the service activities in the value chain benefit from the use of enterprise systems. It is of interest to note that these value chain activities relate to SAP modules already implemented in phase one of the SAP implementation. Through Toyota's Internet initiatives, both the suppliers of new Toyota vehicles and

the customers purchasing these vehicles, benefit from the use of IT. The use of IT places information and options at the fingertips of the customer. Feedback to Toyota's production planning and execution systems is instantaneous, resulting in reduced turn-around time for customers.

IT and ERP systems at Toyota South Africa is a resource that, together with the capabilities of the company, adds value through the distinctive competencies that it creates. Opportunities are also exploited in the value chain in order to reduce cost through better inventory management and create better customer satisfaction through the enhanced customer interfaces. These observations alone do not mean that competitive advantage is achieved by Toyota South Africa through the implementation of SAP. A process of evaluation now needs to be performed to put the facts in context of the broad evaluation criteria in order to add substance to choice or to act as a trigger for change.

4.4 Evaluating the role of ERP

The model for evaluation presented in figure 2.6 will form the basis for evaluating the use of ERP systems at Toyota South Africa. The evaluation framework can perform either or both the functions of system reengineering or business process reengineering. In the case of systems reengineering, the shortcomings of an ERP system or implementation is identified (or a strategic option implemented). This will then in turn create the trigger for change in the existing system as well as the extent of the required change. Analyses that are more detailed are however required to identify the detail of corrective action required.

The evaluation process might also identify shortcomings in business processes when these processes do not fit in the overall business objectives or framework. This will then in turn create a trigger for the business process or chain of business processes to change. Once again, the nature or extent of the required change can only be determined through further detailed analyses.

The model consists of four broad criteria that will be used to evaluate the ERP implementation, but this should only be an initial evaluation in order to identify the

most suitable options or direction and to eliminate the rest, and to identify shortcomings in the implementation that can be corrected to arrive at suitable outcomes. These criteria could also be used from the onset in evaluating different systems to implement. They could then be used further as part of the blueprint phase for designing the requirements for the implementation of the selected ERP system.

In both cases, a signal for organisational change will be send. When evaluating existing implementations, the signal for change will be directed towards the implemented options and the need for adjustment of these options. The trigger for the evaluation process originates through various sources, but more importantly, this is a continuing process where continuous evaluation and change create new triggers that start the whole process over again.

4.4.1 The trigger

The automotive industry in South Africa has been part of the global economy since the mid 1990s, and with this exposure came the need for the industry to change in order to be able to compete internationally. With TMC's acquisition of the controlling shares in Toyota South Africa, the company was set to become a significant exporter of fully build up vehicles. Toyota South Africa finds itself also one of the last major local automotive manufacturers to be wholly owned by their overseas holding companies.

Toyota South Africa's vision states, "Prosperity for all stakeholders through world competitiveness and continuous growth." The company's vision, together with their aim to increase market share and improving production, were the prime motivating factors behind the decision to implement SAP. The direction this implementation took was governed by Toyota's corporate philosophy that advocates the "quality" rather than "quantity" approach. The manufacturing divisions needed to change from a "make-to-stock" manufacturing philosophy, to a "make-to-order" environment, in order to ensure customer satisfaction through a customer demands driven focus.

These changes and requirements resulted in the decision to implement SAP at Toyota South Africa. In order to respond to a trigger is only the start; how clearly the

organisation identifies the requirements in order to act on the triggers, becomes more vital. An evaluation process need to take place in order to determine the choices open to act on the trigger, or to determine the ability of a current implemented strategy (or information technology) to react to the changing environment and needs.

4.4.2 Consistency

The triggers for change based on the vision of Toyota South Africa, and the manufacturing and distribution philosophy, is a clear indication that the ERP implementation aims to satisfy the organisational objectives and the values of management. At TSP, SAP demands discipline from the users of the system, and now the division has a "true picture" of the business, resulting in improved control. SAP has given TSP more stability, and created a platform from which organisational and process change can be implemented. Job objectives, linked to the long-term objectives are now being achieved.

Due to the nature of an ERP system, all business processes that use SAP will form part of the whole that is an ERP system. The result is business processes that are aligned through their interdependence. This allows the coordination and planning processes within the organisation to be streamlined and executed using the ERP system. With the shift in the manufacturing and distribution philosophy of Toyota South Africa, coordination with TMC's objectives are being realised, and the organisation is moving closer to a world wide consistent approach in strategy.

The choice of SAP is based on the fact that the product has been available internationally the longest, and it is the market leader (Language 2003, p. 11) in the ERP market. Toyota South Africa is implementing a world-class system as the business tool of choice. SAP encapsulates everything that is expected from an ERP system.

Overall, the use of SAP adheres to the test of consistency. SAP will satisfy the requirements of Toyota South Africa, as well as those of Toyota Motor Corporation. A more detailed and in depth analysis of the organisation need to be performed in order to ensure consistency is maintained down to activity level. The final

implementation of the ERP systems is not yet complete, and this already creates a new trigger for evaluation of the completed implementation. Internal evaluation is however only the starting point in the continuous evaluation process; the external environment is just as important and must be taken into account when evaluation is done in order to arrive at the most correct conclusions.

4.4.3 Consonance

Consonance, or matching deals mainly with the basic pattern of economic relationships that characterise the organisation and determine whether or not sufficient value is being created to sustain the strategy, or ERP implementation. This fit deals with the mission of Toyota South Africa as well as its competitive position in the external environment.

Toyota South Africa has grown from its start in 1961, to be the largest automotive manufacturer in the country. The company celebrated its 23rd year as overall market leader for sales of new vehicles in South Africa by the end of 2002. This is a clear indicator that the company is achieving what it set out to do in its mission statement. Toyota South Africa is dedicated to supplying a range of vehicles, parts, accessories, and services to meet the requirements of the South African and export markets that it services; ensuring that products are of outstanding quality, value for money and instil pride of ownership; developing and maintaining a dealer network which will provide superior service and excellence in customer care.

The CCSI survey clearly shows Toyota South Africa as the leader where the company achieved highest score for overall customer satisfaction in the category of light commercial vehicle sector. In the passenger vehicle segment, Toyota came second with a score of 90.6 percent. Toyota South Africa and its dealers are providing the best purchasing and service experience in their vehicle market segments through the use of customer orientated enterprise systems. Customer satisfaction is ingrained in the corporate philosophy of Toyota South Africa, and is actively managed within the company

The customer satisfaction and brand surveys support Toyota's position as overall market leader. Toyota South Africa achieved this position through acting on its vision and following through with their mission. In order to maintain the position, the company had to ensure that their systems could provide the necessary support. The move to implement world-class systems, like SAP, clearly shows their commitment to maintain this position. As a market leader, Toyota South Africa also leads with the use of new technology supplied by SAP; the advanced planning and optimisation (APO) modules in conjunction with the automotive industry solution offered by SAP.

4.4.4 Advantage

Toyota South Africa possesses a superior position in the market it operates in. The future growth of the company depends on Toyota being a leaders rather than followers. Toyota needs to develop exiting new initiatives to keep their brand on the forefront. The market position that Toyota enjoys must be defended and through change and innovation, make it difficult for competitors to imitate. The ERP systems provide a tool to ensure that the processes supporting the business do not lack the ability to support the initiation of new initiatives. The use of enterprise systems could also further spark the development of new initiatives through new abilities not previously available to the organisation. One such initiative is the use of the Internet to integrate with the production systems. Customers can make their choices on vehicle configuration options online with the dealer and these are converted into orders and production requirements at the manufacturing division without the need for intervention and data capturing by the administrative departments.

TSP has proven that the use of ERP can be leveraged to achieve long-term objectives. The enterprise system gave the division the opportunity to create new work processes and gain more control over the business. ERP created more stability in the company and provide a basis for continuous business improvement.

Besides superior position in the market, superior resources and skills are some of the other factors that influence competitive advantage. The opportunities for creating resources through the use of ERP are realised in the form of organisational learning; new skills can be sourced, knowledge transfer can take place and new skills can be

learned. Organisational learning combined with the ERP system resource can create distinctive competencies that support Toyota South Africa's position as market leader and can further lead to value creation.

4.4.5 Feasibility

Feasibility is the most detailed evaluation technique and is also the criterion that could disqualify an option based on practicalities, like the availability of funds. Even though Toyota South Africa is currently cost savings initiatives, funding for the ERP implementation cannot stop at this stage. The implementation of SAP at the manufacturing divisions is already exceeding the estimated period of three years originally planned for the implementation. This result in more effort that is required to complete the project and also the cost increases due to the fact that people are tied up in the project for longer. The business cannot have resources freed up as planned and skills are lost due to other contractual obligations and new skills have to be sourced, resulting in a new learning curve. In light of the fact that the company has made operating losses since 2000, new cost savings drives has been initiated by TMC, that has a direct impact on the resources tied up in the ERP implementation.

At TSP, the implementation is producing quantifiable benefits through increased supply chain activities. Accurate measurement of the performance of suppliers are possible through timely deliveries as a result of accurate and early ordering and the support by the suppliers for the range purchased from them. Inventory holding has been reduced to less than four month's stock with accurate stock records.

Based on the success at TSP, the manufacturing divisions can therefore expect to reap benefits in the long run. The ability of the manufacturing divisions to execute the enterprise system implementation can be assessed with the questions listed in table 2.6 and will provide a measure of the feasibility of the implementation.

a) Has the Toyota South Africa demonstrated that it possesses the problem solving abilities and/or special competences required by the enterprise system implementation? The success of TSP indicates that this is true, but it must be noted that different project managers and sponsors were involved. Different

skills are deployed in the manufacturing divisions for the final phase of the ERP implementation and the result is no continuity or commonality in the implementation across the organisation.

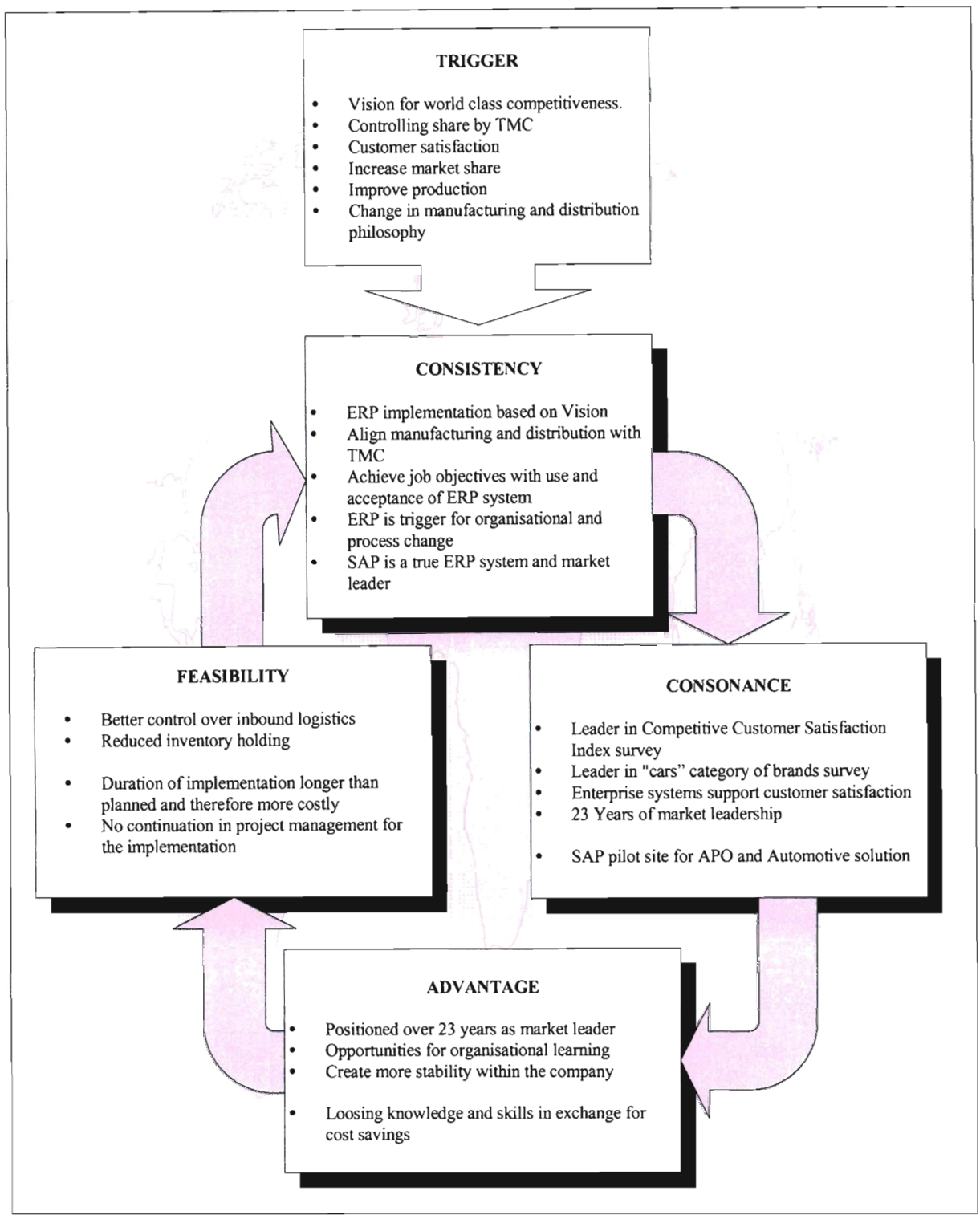
b) Has Toyota South Africa demonstrated the degree of coordinative and integrative skills necessary to carry out the implementation? As discussed already, the company operates along a common vision and mission in order to achieve a common goal. Even though lack of continuity is identified, the overall direction of strategy within the company is well directed.

c) Does the ERP implementation challenge and motivate key personnel and is it acceptable to those who must lend their support? One of the most important aspects of a change in technological systems is that of change management. Not all personnel are ready to accept the change in process or activities without an effort to convince them otherwise.

4.4.6 Results of ERP Evaluation at Toyota South Africa

The results of the evaluation of ERP system implementation at Toyota South Africa is summarised in Figure 4.2 below. Toyota South Africa reacted on the triggers for change and implementation of enterprise systems in the company. The evaluation process set out to determine what is done well by the company, and is there any shortcomings that should be addressed.

Figure 4.2 - Fit of ERP Implementation at Toyota South Africa



The overall indication is that the implementation should add to the company's strategic advantage. In the case of Toyota South Africa, enterprise systems play a supporting role to ensure that the company maintains its position as market leader. As far as the manufacturing divisions are concerned however, it seems that the company is not yet achieving the success it had with the implementation at TSP. ERP systems

are being implemented in order to ensure efficient production, but the implementation of the manufacturing modules in SAP are not yet complete. With the broad criteria indicating that ERP at Toyota South Africa should add value for the company, more detailed and quantitative analysis of strategy and systems could be performed.

4.5 Summary

The success achieved by TSP is an indication of the potential for successful utilisation of ERP systems at Toyota South Africa. Through the implementation of enterprise systems that enhances customer satisfaction, the company is already reaping the rewards IT has to offer through its market position supported by Toyota's strong brand name. Benefits will be realised through the implementation of SAP and other enterprise systems at Toyota South Africa through improvements in the supply chain; improved and efficient stock holding and inventory control being the main benefits.

The ERP implementation satisfies the criteria of consistency, consonance, and advantage. Toyota's strategy is clearly supporting their vision and mission, and this is an indication that the IT systems supporting the company's strategy are adding value. The criterion for feasibility indicates that the longer than expected duration of the implementation project is potentially adding to the drain on the company's resources. This situation should be evaluated in light of the fact that the company has had an operating loss for the past three years since 2000.

5 CHAPTER FIVE

5.1 Introduction

Toyota South Africa is the leading manufacturer of vehicles in South Africa. The Toyota brand name is stronger than any other brand in its market segment and is achieving high customer satisfaction levels, receiving the highest scores in the light commercial vehicle sector, and second place in the passenger vehicle sector.

The company is dedicated to its mission and in order to support it, Toyota South Africa is deploying world-class enterprise systems. The company's achievements are an indication that these enterprise systems are contributing to Toyota's success. However, the replacement of legacy systems is not completed, and the implementation of enterprise systems to support the critical manufacturing processes is still in process.

Utilising enterprise systems at Toyota South Africa has the potential to help create competitive advantage. ERP systems at Toyota South Africa play an important role in the value creating activities of the value chain, creating productivity improvements, reducing inventory holding and costs that lead to improved customer satisfaction.

5.2 Benefits from ERP

Toyota South Africa is in the process of finalising its implementation of enterprise systems in order to gain complete integration in all the business processes throughout the company. Viewing these systems as a resource and recognising the role ERP plays in creating new competencies, mainly through organisational learning, it is clear that enterprise systems can qualify as part of the basis for sustainable competitive advantage.

This holds true despite the fact that these resources are available to every competitor in the automotive industry. The challenge therefore is to configure and implement these systems in a superior way. This can only be done in one of two ways, through

the planning for implementation or through processes of continuous business improvement.

5.2.1 Planning Implementation

If a new system is considered, the blueprint for the implementation should be the result of strategic planning and evaluation in order to determine the desired strategic direction and expected support required from the ERP system for the chosen strategy. Once this is completed, the underlying business processes can be evaluated and aligned with desired strategic outcomes.

In the case of Toyota South Africa, the evidence supports the notion that strategy was one of the triggers for the implementation of enterprise systems in order to replace the legacy systems. There is no clear evidence that these systems were specifically aligned to strategy as part of strategic planning; the evidence seem to point at the fact that enterprise systems are being implemented in order to support existing business processes. The fact that SAP will help with the company's move from a "make-to-stock" manufacturing and distribution philosophy to a "make-to-order" environment, and support the customer demands driven environment, does not indicate that the system will be implemented in conjunction with strategic planning, but rather that the underlying business processes must be supported in order to execute this change in strategic direction. At TSP, it is merely used to streamline the value chain.

Strategic advantage can still be obtained in this way, but in this scenario, the resource is implemented in order to help the business process support the implemented strategy more effectively. The danger is always that a "bad" process is still in place, but through technology, the inefficiencies are still hidden. The company is still doing the same thing in the same way, but with better systems to support them. The aim of implementing ERP as a result of strategic planning with input to the blueprint, is to do the same things better and to find ways of doing things differently. Dr van Zyl remarked, "The future growth of our company depends on us being leaders rather than followers. We cannot rest on the laurels of market leadership – we must develop exciting new initiatives to keep the Toyota brand in the forefront of a significantly changing market" (Toyota News October 2002).

Measured against these facts, Toyota South Africa did not achieve the best possible outcome for their ERP implementation. Under these conditions, the existing systems and processes need to be evaluated in order to identify the changes required.

5.2.2 Continuous Business Improvement

All is not lost if the implementation was not initially based on strategic planning, and even if the approach was taken, strategy needs to be evaluated and revised continuously. Toyota South Africa is leveraging ERP in order to improve productivity, cut costs and gain control as found in TSP. In order to identify the changes required in the implemented enterprise systems, IT must form part of the strategic planning process. A clear understanding of the company's strategic processes must form the basis of changing an existing implementation. Once the strategic requirements are identified, the underlying business processes must be examined in order to determine how best they could meet the strategic requirements. The result of this process could be a new business blueprint for change in the processes.

Part of the new business blueprint must be a precise guideline of the information requirements by management. The ERP system offers a large amount of information that could easily be misinterpreted by, or overwhelm the managers. The information requirements must take into account the skills of management to interpret, manipulate and utilise the available information in a timely manner. Information must provide trends and help managers to steer the business effectively in a changing environment. Information must enable managers to react to changes in the environment before it is too late, and this usually require the managers to have the skills to perform these tasks.

5.2.3 Extending the Life of the Resource

Through the process of continuous evaluation and improvement, the role and function of ERP is constantly evaluated and changes implemented, effectively extending the usefulness of the system, ensuring that the system stay robust in the face of a

changing business environment. ERP systems, as with any other IT resource, has a relatively short lifespan, during which period the system stays unchanged. "Upgrades" to the existing systems are continuously introduced as new technology becomes available, or as new customer requirements are identified and implemented by the ERP vendor. These updates are part of the licensing agreements with most ERP system vendors and an accepted course of action. Important though is the fact that these updates must not disrupt the business processes at all.

Toyota South Africa is adopting new technology provided by SAP, the automotive solution running with APO, that is potentially high risk. This implementation was unique in the automotive industry worldwide when the decision was made, making Toyota South Africa a "test site" for this implementation. These modules are part of the ERP implementation for the most critical manufacturing operations, the assembly lines for Toyota vehicles. This does however reiterate the company's position in the market as market leader, and sets them apart as a technology adopter. The benefits experienced by the organisation when implementing ERP systems cannot be disputed, but the place ERP systems occupy in the strategic framework must be understood in order to leverage the capabilities provided through their use in order to achieve competitive advantage.

5.3 Analysis of Evaluation Model

Through the analysis done on the implementation of enterprise systems at Toyota South Africa, it is clear that all the triggers were moving the company towards the choice to replace the old legacy systems with enterprise systems. The chosen ERP system that will form the basis for implementation of the Toyota South Africa business processes is SAP, the world leader in ERP systems. SAP will integrate with all other enterprise system.

It is found that the chosen implementation satisfies the criteria of consistency, consonance, and advantage, but the evaluation criterion of feasibility requires analysis that is more detailed. The cost incurred due to a prolonged duration of the implementation can be offset against the savings realised through better logistics control and reduced inventory holding, pushing the period for return on investment

out. Other ways of financing the extended implementation and overspending could also be found in the current economic climate where interest rates are low.

The aspect of skills, knowledge transfer and continuity need to be addressed. Organisational learning leads to the creation of capabilities that could be superior in Toyota South Africa, which in turn can enhance the core competences of the company. These core competences are required to support the company's position in the market in order to lead to value creation (Figure 2.2).

Part of Toyota's mission statement deals with this aspect, through its commitment to the development of the skills and potential of all its employees. In order to achieve this, training, learning new skills and knowledge transfer should form part of the ERP implementation blueprint and should therefore be a product of the strategic planning process. Knowledge transfer must be actively managed in order to create competencies in the company and maintain them in the long run.

5.4 Conclusion

Through the evaluation of the Toyota South Africa case study, and the literature review, it can be concluded that the use of ERP systems can add to the strategic advantage of an organisation. Through a resource-based view of ERP, it is clear that for a manufacturing industry, it is not the resource that will give an organisation competitive advantage, but it is this resource that will enable an organisation to sustain competitive advantage.

ERP systems can leverage opportunities in the value chain in order to obtain efficiencies, cut costs and add greater control over the value system the organisation operates in. Internally, it also facilitates the process of organisational learning and continuous business process improvement. ERP systems also provide information that should enable management to make better decisions. Only if the information requirements are part of the ERP implementation blueprint, and if management understand the requirements for information and are able to analyse the results, will the availability of information enable meaningful decisions.

Information technology is one of the most volatile resources in use by any organisation today. Recognising this fact and understanding the importance of IT in the organisation is critical for managing this important and useful resource. Unless the strategic planning process, through to evaluation and implementation, take this enabling resource into account and clearly define the requirements from the use of IT, sustained competitive advantage will not be supported, and the company could even face failure due to inadequate support of business processes or inaccurate information.

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