FORMULATION OF A STRATEGY FOR AN ENGINEERING DEPARTMENT

BY

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ABSTRACT

The increased competitive pressure in the world steel industry is forcing ISCOR to become more cost competitive. In an attempt to attain this goal, a management consultant was commissioned to evaluate all business aspects of ISCOR. The methods used by the consultant caused concern at certain departments at ISCOR Vanderbijlpark. The Engineering Technology Development (ETD) department identified the lack of a well defined strategy as being counter productive in ISCOR's quest for continuous business improvement.

In this script, the literature on strategic management was reviewed and applied to develop a practical and flexible model which can be used by a typical manager to determine and formulate the strategic options of his or her department or organisation. The model consists of the following main activities:

- Assessment of the company's external environment, including both the competitive and general contextual factors.
- Performing an internal analysis that determines ETD's internal conditions and capabilities.
- Identifying the various strategic issues of ETD by considering the different strengths , weaknesses, opportunities and threats.
- Connecting the different strategic issues to strategic themes.
- Choosing appropriate grand strategies associated with each strategic theme.
- Strategy formulation.
- Defining the mission and vision for ETD.

The model was successfully applied in an engineering department (ETD) at ISCOR Vanderbijlpark. ETD is directly influenced by the ISCOR Vanderbijlpark change initiatives.

ETD identified different strategic issues to help develop their main strategies. The first set of issues had to do with ETD's weaknesses and threats. The weaknesses that make ETD the most vulnerable to the various threats will receive high priority. The weaknesses with the highest priorities will be strategic issues for ETD. The first set of strategic issues that were identified are:

- The low standard of overall business excellence
- ETD's weak market image
- No strategy
- No experience competing in the competitive marketplace.

ETD found it important to firstly address these strategic issues that originated from their weaknesses and threats. A *turn-around strategy* has been identified as the primary grand strategy in addressing the above mentioned issues. Concerted effort must be given to certain key aspects of the South-African business excellence model (SABEM). This will help improve the current status and effectiveness of ETD. The key aspects of the business excellence model which will receive immediate attention are:

- policy and strategy,
- customer and market focus,
- processes, and
- customer and people satisfaction.

The second set of strategic issues had to do with ETD's strengths and opportunities. The strengths that have the highest impact on the various opportunities will receive high priority. The strengths with the highest priorities will be strategic issues of ETD. The second set of strategic issues are:

- The pro-active management style present at ETD.
- The current application of international standards and practices used when defining processes of operation.
- ETD has an above average mixture of experience and youth to effectively implement a differentiation strategy.
- The technical and project management skills of ETD have not been fully exploited.

In supporting the main turn-around strategy ETD identified various other grand strategies to strengthen their current core competencies and position in the market.

The following strategies were identified to support the main strategy:

- a concentrated growth strategy,
- a market development strategy, and
- a product or service development strategy.

ETD developed their mission and vision to reflect their intent in the market.

This strategic plan addresses the factors influencing the daily operation of ETD. The strategic process identified a need for service departments, like ETD, to become more business orientated. The implementation of this strategic plan will have a positive effect on both the ISCOR overall business strategy and the industry in which ETD operates.

UITTREKSEL

Verhoogde kompetisie in die wêreld markte het ISCOR genoodsaak om meer koste kompeterend te raak. In 'n poging om hierdie doelwit te bereik het ISCOR 'n besigheidskonsultant genader om die besigheid van ISCOR te inspekteer en ISCOR te help om te verander. Die metodes wat deur die konsultant gebruik word geniet nie die ondersteunng van sekere departemente by ISCOR Vanderbijlpark nie. Ingenieurstegnologie ontwikkeling (ITO) het die afwesigheid van 'n goed deurdagde departementele strategie as 'n struikelblok vir verandering geidentifiseer.

In hierdie studie word die literatuur oor strategiese bestuur nageslaan en toegepas om 'n praktiese model te ontwikkel wat deur bestuurders gebruik kan word om die strategiese keuses van hul spesifieke organisasies te formuleer. Die model bestaan uit die volgende hoof aktiwiteite:

- Die ondersoek van ITO se eksterne omgewing, insluitende beide die kompeterende en algemene kontekstuele faktore.
- Die uitvoer van 'n interne analise wat die interne situasie en vaardighede van ITO bepaal.
- Die identifisering van verskeie strategiese aspekte van ITO deur gebruik te maak van hulle sterkpunte, swakpunte, geleenthede en bedreigings.
- Koppeling van die verskillende strategiese aspekte aan strategiese temas.
- Die kies van gepaste oorhoofse strategië wat geassosieer kan word met die strategiese temas.
- Strategie formulasie.
- Definisie van ITO se missie en visie.

Die model is suksesvol gebruik om 'n strategiese plan vir ITO te formuleer.

ITO het verskillende strategiese aspekte geidentifiseer. Die eerste stel aspekte neem ITO se swakpunte en bedreigings in ag. 'n Prioriteit word gestel aan die swakpunte wat ITO die mees kwesbaar maak vir sy bedreigings. Die eerste stel strategiese aspekte wat geidentifiseer is, is die volgende:

- Die lae standaard van besigheidsvaardighede.
- ITO se swak mark aansien.
- Geen strategie.
- Geen markervaring nie.

ITO het die bogenoemde strategiese aspekte gebruik om die hoof strategiese fokus te formuleer. ITO het 'n omkeer strategie as hulle primêre strategiese opsie geidentifiseer. Met die implimentering van die omkeer strategie moet daar aandag gegee word aan die volgende belangrike gedeeltes van die Suid-Afrikaanse besigheid uitnemendeheid model (SABUM):

- beleid en strategie,
- klient and mark fokus,
- prosesse, en
- klient en werknemer tevredenheid.

Die tweede stel strategiese aspekte word bepaal deur koppeling tussen ITO se sterkpunte en geleenthede. Die sterkpunte wat die hoogste impak het op ITO se geleenthede, word beskou as strategiese aspekte. Die tweede stel aspekte word beskou as:

- Die pro-aktiewe bestuursstyl teenwoordig by ITO.
- Die gebruik van internasionale standaarde en praktyke om prosesse en bedrywighede te identifiseer.
- ITO het 'n bo-gemiddelde samestelling van ondervinding en basiese talent om 'n diversifikasie strategie te implimenteer.
- Die tegniese en projekbestuur vaardigheded van ITO is nog nie ten volle benut nie.

ITO het die volgende strategië geidentifiseer as ondersteunend tot die bogenoemde omkeer strategie. Die strategië is:

- 'n gekonsentreerde groei strategie,
- 'n mark ontwikkelingsstrategie en
- 'n produk of diens ontwikkelingsstrategie.

ITO het 'n missie en visie geformuleer om hulle nuwe posisie in die ISCOR omgewing duidelik te maak.

Die strategiese plan spreek aspekte wat die daaglikse bedrywighede van ITO beinvloed aan. Die strategiese proses het 'n leemte by huidige dienste seksies binne ISCOR geidentifiseer. Hierdie leemte is die swak besigheidsvaardighede van dienste seksies. Die implementering van die strategiese plan sal 'n positiewe effek hê op beide die ISCOR besigheidsstrategie en die mark waarin ITO besigheid doen.

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CHAPTER 1
PROBLEM DEFINITION

1.1 Introduction

Due to increased competitive pressure in the steel industry the parent company, ISCOR, came under severe pressure to become more cost competitive in a global market.

In an attempt to attain this goal a management consultant was commissioned to evaluate all aspects of the business and propose improvement initiatives. One of the methods organisations use to achieve the goal of becoming more cost competitive is to apply ready-made, one-size-fits-all cost cutting solutions across all organisations and departments. Although the need for change and continuous improvement are clear, this process causes serious concerns inside Engineering Technology Development (ETD).

The concerns stem mainly from the belief that organisations can not achieve sustainable and continuous business improvement without having a detailed strategy in place. No clearly defined, documented strategy exists for any of the Strategic Business Units (SBU) in this organisation, including ETD.

Large diversified corporations, like ISCOR, typically have three distinct levels of strategy; corporate strategy, business level strategies and functional strategies. Although the functional strategy makes up the bottom of this hierarchy of strategies, it alone is capable of implementing and executing the corporate and business level strategies. This is true because at this level one finds the corporation's resources. Functional strategies achieve this implementation by means of budgeted resource allocations; with the emphasis on the matching of tasks, people, structures, technologies and reward systems.

The management consultants operated at the level of business strategy, which led to the identification of the need for a strategy to guide and support the improvement opportunities where it concerns ETD. ETD provides project management and process automation services to different plants through the use of a fairly small group of specialized people. This might lead to the conclusion that a fully detailed strategy might not be required. The idea however is to truly define the core essence of ETD's existence and plot out a plan for the future.

1.2 The Steel Industry and ISCOR

ISCOR Steel is making itself leaner and more cost-competitive because it believes that in the future the only sure winners in the commodity business will be low-cost producers of high-quality products. Against this background ISCOR Steel embarked on improvement projects aimed at reducing costs and increasing effectiveness. At its Vanderbijlpark works the focus of this improvement project is on achieving the following key targets:

- reducing compressible costs by 40% (total cost by 25%),
- radically improving operational performance,
- serving the local market with on-time delivery and quality,
- radically reducing the wide product range and cutting out non-profitable facilities,
- focusing on selected exports, and
- enhancing the overall skills base.

The term *compressible cost* describes those costs that the organisation can reduce without it having a negative effect on the core business processes. This includes the reduction in work-force to achieve a more competitive fixed cost ratio. ISCOR has to compete with very efficient international producers where major productivity improvements have already been introduced. A recent study and benchmarking exercise indicate that international mills, producing approximately the same volume and product mix as the Vanderbijlpark works, employ no more than 8000 people. This does not compare favourably to the 14000 people currently employed at the Vanderbijlpark works.

Nowadays, the wealth of businesses, and nations, seems to depend more and more on the knowledge and skills of their people. The question thus remains, if ISCOR has to reduce the workforce at its Vanderbijlpark works by approximately 6000 people, how to do this without having a negative influence on the future of ISCOR Flat Products? Van Niekerk, MD Steel (1998:17) states that ISCOR does not have all the answers yet, but he does indicate that ISCOR will in future focus more on *core business and core competencies.*

1.3 Strategy as an element of success

Operational effectiveness and *strategy* are essential building blocks towards achieving superior performance. Porter (1996:61) greatly publicises the need for improved effectiveness and *strategy*. He warns that as organisations, and departments for that matter, increasingly attempt to improve effectiveness they must guard against moving away from viable competitive positions.

Davidson (1995:59) and Markides (1997:11) supports this view when both of them make it clear that by adding *strategy* and *strategic innovation* to operations organisations will achieve success.

Galagan (1997:32) states "What was it about the high performers that made them so successful? They had strong *strategies* for their type of business, and they adapted when necessary."

The magnitude of the change initiatives in ISCOR do not allow any aspect of the current business functions to go unchanged. This provides ETD with the unique opportunity to actively manage this process of continuous change, thereby addressing the issue of the strategic role of the department in the future of ISCOR Flat Steel.

The development of a *strategy* is an important step in assessing the role of process automation, as supplied by ETD at ISCOR Vanderbijlpark. This strategy must take into account the specific type of business (process automation) of the department together with the current business environment in ISCOR and help it adapt to the changing environment wherein it operates.

1.4 Strategic importance of Process Automation

To stimulate the debate over the importance of process automation functions in big corporate companies such as ISCOR, it is useful to analyse the current trends in the markets. The main sector of study will be the base metal industry with special reference to the steel industry.

An urgent need to produce at lower costs and meet international standards set by European competitors are seen as key success factors in this industry. Recent research performed by Access Market International (AMI) on the competitive performance of the base metal industry indicates that the competition in this sector is increasing due to lower profit margins, import threats from international competition and over capacity in certain industries.

The results of this study indicates that the emphasis is on the use of new processing technologies to achieve this lower cost and increased quality targets. Large companies indicated that they improved their competitive performance over the past two years by means of capital expenditure focussed on modernisation and *process automation*.

It is important to note that AMI listed *process automation* as an area whereby companies can improve competitive performance. This sentiment is shared by Strydom (1997:26) when he states that South-Africa has to use all its resources and become automated to reach world class competitive levels. The general consensus is that management has to consider automation in its strategic planning and use technology to gain a competitive advantage.

1.5 Objectives of this dissertation

To finalise the scope of objectives set for this dissertation it is important to describe the process of developing a strategy called strategic management. In summarising the thoughts of Wright et al. (1994:17) and Davidson (1995:1) strategic management is an *all-encompassing approach* dealing with the formulation, implementation and evaluation of strategic issues in a dynamic competitive environment.

The purpose of this paper is to review the literature on strategic management, in order to *formulate* a strategy for ETD, ISCOR Vanderbijlpark.

1.6 Research methodology

This paper will be a descriptive research project. After reviewing the literature on strategic management, the aim will be to formulate a strategy for ETD. This objective will be achieved by compiling the information obtained from the literature study into a structured format by making use of a model describing a practical strategic management process.

1.7 Methods of obtaining information

The main methods used to obtain information are:

- Structured and unstructured interviews with the 12 project managers and engineers of ETD in the metallurgical area ISCOR Vanderbijlpark.
- Project meetings with relevant departments within ISCOR Vanderbijlpark (metallurgical area) and the project managers and engineers of ETD.
- Evaluation of existing ISCOR Vanderbijlpark documentation concerning projects performed in the metallurgical area.
- Brainstorming sessions among the 12 project managers and engineers of ETD.

1.8 Limitations of the study

All the work done in this dissertation is applicable to ETD ISCOR Vanderbijlpark and might not have any relevance for other support departments in similar industries.

The rapidly changing ISCOR environment is having a limiting effect on the development of the strategy. A negative culture and resistance to change makes it difficult to conduct meaningful information sessions without negative feelings making their way into conversation.

1.9 Further deployment

Chapter 2 defines strategy and discusses the nature and value of strategic management. Relevant information including the levels of strategy and who takes part in the strategic management process are supplied. To ensure the timely execution and success of strategic management, it must be in the form of a structured process. Structure is given to the process by a model which is supplied in chapter 2. This model identifies the different stages of the strategic management process focusing on strategy formulation.

Chapter 3 concludes this dissertation and is the result of the practical application of the strategy formulation phase, for ETD, through the use of the strategic management model.

The formulation phase, as described in the model, consists of:

- A situational analysis.
- The identification of strategic issues using a modified SWOT analysis.
- Connecting strategic issues to strategic themes.
- Choosing appropriate grand strategies from each strategic theme.
- Strategic formulation
- Defining the mission and vision for ETD

The result will be a strategy for ETD as developed by implementing the strategic management process.

CHAPTER 2
LITERATURE OVERVIEW

2.1 Introduction

ISCOR Vanderbijlpark is starting a far-reaching process of transformation, that will affect its entire workforce and challenge their ability to adapt to the fullest. This signals the beginning of a continuous cycle of change and performance improvement initiatives.

It has already been concluded that it would be wise to include strategy as part of ETD's future planning. ISCOR as a diversified group developed a corporate strategy, ISCOR Vanderbijlpark has developed a business level strategy and set clear objectives for the different functional areas. It is however, clear that no functional strategy has been developed to address the role of automation departments, like ETD, in the future of ISCOR.

This chapter aims to provide some background about strategic management and will provide a structured method of developing a strategy. This structure will then be implemented by ETD.

2.2 Defining strategy

The word *strategy* is sometimes used without a clear understanding of its meaning. Publications from Walker et al. (1996:8) and Brown (1997:3) define strategy as fundamental patterns of present and planned objectives, resource deployments, and interactions of an organisation with markets, competitors, and other environmental factors. Present and planned objectives must take into account the capabilities of the company and the competitive environment in which the specific capabilities of the company are offered to customers. The competitive environment must be analysed to establish a fit between the capabilities offered and existing opportunities.

The department must therefore analyse their distinctive capabilities and determine the relevance of these capabilities to their immediate marketplace (ISCOR). ISCOR is in need of certain strategic capabilities in process automation. It is ETD's responsibility to create, maintain and provide these needed capabilities.

It is important to place the development of a strategy inside the overall management plan of a business. Strategy should form part of an ongoing strategic management process continuously evaluated and improved upon.

2.3 Nature and value of strategic management

When planning their change process ISCOR formulated a growth strategy for the Vanderbijlpark works. ISCOR acquired the services of a business consultant to help in the development of a strategic plan for the works. Galagan (1997:32) supports the view that companies cannot realise continuous improvement without growth. The

value of strategic management is to help companies to grow and looking at the trends in the marketplace, it its likely that strategic management will be the number one management issue now and for the next five years.

The nature of strategic management can be closely connected to the development of strategic options and the implementation of these options. Supporting this view Wright et al. (1994:17) describes strategic management as the continuous process of determining the mission and goals of an organisation within the context of its external environment, formulating appropriate strategies, implementing those strategies, and exerting strategic control to ensure that the organisation's strategies are successful in attaining its goals.

Strategic management is thus a managed process which consists of formulation activities, implementation activities, evaluation activities and continuous feedback to ensure the success of the previous activities.

> Davidson (1995:1) states " Strategic management creates the competitive edge that makes winners. It harnesses all the potential of an organisation to this end by causing every day-to-day operating decisions to be made in a pre-eminently strategic manner. It is a way of thinking, a guide to action and the determinant for the behaviour of every member of the organisation."

Strategic management has, over the years, been developed and defined with the objective of adding value to the operations of any company and in this case ETD of ISCOR.

2.4 Levels of strategy

In a diversified company such as ISCOR, strategies are initiated at four distinct organizational levels. Figure 2.1 depicts the strategy-making pyramid which indicates the four different organizational levels.

Corporate level
At the top of this hierarchy is the corporate level, composed primarily of a board of directors and the chief executive officer. Corporate strategy involves the managing of a diversified portfolio of businesses and includes initiatives to boost the combined performance of existing businesses. The above mentioned initiatives involve finding ways to capture synergy among related business units and to turn this into a competitive advantage.

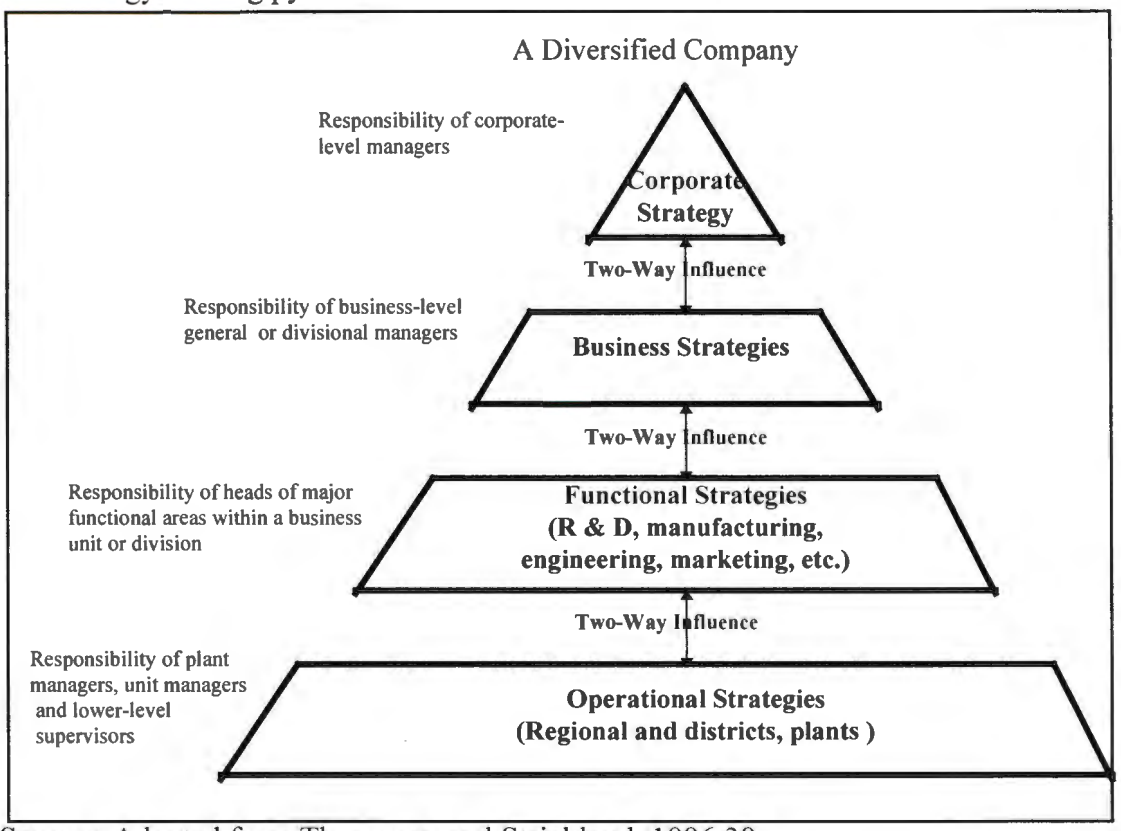
> Synergy is an attempt to create, 2 + 2 = 5 effects in organisations, which means the whole is greater than the individual parts.

A further initiative of corporate strategy is establishing investment priorities with the aim of directing corporate resources into the most attractive business units.

The major strategic thrust contained in ISCOR's corporate strategy can be stated as:

> *Limiting expansion in current markets and diversifying into more appealing markets.*

Figure 2.1
The strategy-making pyramid



Source: Adapted from Thompson and Strickland. 1996:38.

Business level

The second level on the decision making hierarchy is the business level, composed principally of business-level general and divisional managers. According to Pearce and Robinson(1994:5) these managers must translate the statements of direction and intent, generated at corporate level, into concrete objectives and strategies for individual divisions and businesses.

With the help of a business consultant the ISCOR Vanderbijlpark flat products business unit formulated a business strategy in direct response to changes in the industry, the economy at large, the regulatory and political arena, and changes in other relevant areas. The objectives of the business strategies must include the crafting of competitive moves and market approaches that can lead to sustainable competitive advantage, uniting strategic initiatives of functional departments and addressing company-specific strategic issues and operating problems facing the business units.

Key elements of the ISCOR Vanderbijlpark flat products business level strategy are the following:

Strategic focus / intent:

> *ISCOR flat products Vanderbijlpark will strive to be a overall low cost producer.*

Objectives: **S** - Serve the local market better
T -Target selected export markets
E - Excel in operations
E - Enhance people skills and abilities
L - Low cost producer

Functional level
The functional strategy is a managerial game plan for running particular parts of the business. This game plan consists of function-specific approaches and moves crafted by management to support the overall business strategy.

Objectives of functional strategies include

- Providing support for the overall business strategy
- Specifying how functional managers plan to achieve functional area performance objectives.

Operating Strategy
Thompson and Strickland (1996:44) support the statement that operating strategy can be described as narrower strategic initiatives and approaches for managing key operating units (plants, sales districts, distribution centres) and for handling daily operating tasks with strategic significance ".

Operating strategies add further detail and completeness to functional strategies and to the overall business plan.

2.5 Who takes part in the strategic management process

ISCOR is a diversified company with interests in mining and the production of steel and speciality steel products.

There are four distinct levels of managers with strategic responsibilities in a diversified company like ISCOR.

- The chief executive officer and other senior corporation-level executives who's responsibilities are strategic decisions affecting the total diversified company.
- Managers who have profit-and-loss responsibility for one specific business unit.
- Functional area managers within a given business unit who have direct authority over a major piece of the business (manufacturing, marketing and sales,

engineering and R & D) and whose role it is to support the business unit's overall strategy with strategic actions in their own areas.

- Managers of major operating units (plants, sales districts) who have on-the-scene responsibility for developing the details of strategic efforts in their areas and for implementing and executing the overall strategic plan at the grass roots level.

It became evident that the mechanisms put in place to transform the Vanderbijlpark works did not include dealing with minor strategic processes like process automation. In an effort to address this shortfall ETD had no choice but to become personally involved in the strategic management of their own future. This move to cascade strategic involvement down to worker level is supported by Thompson and Strickland (1996:16) and Galagan (1997:35).

> Lambert (1997:18) states that "We must empower all our people to think strategically, and that means that every employee must be fully aware of what's in it for them when vision becomes reality ".

ETD realised that if they were to succeed in implementing the results of this study, they had to persuade a key decision maker in top management to champion the strategic direction ETD wished to take. The existence of an effective strategic management process will not ensure success of the current activities of ETD. The champion must have profit-and-loss responsibilities in the Vanderbijlpark business unit.

2.6 The strategic management process

To ensure the timely execution and success of strategic management, it must be in the form of a structured process. Structure is given to the process by the model shown in figure 2.2.

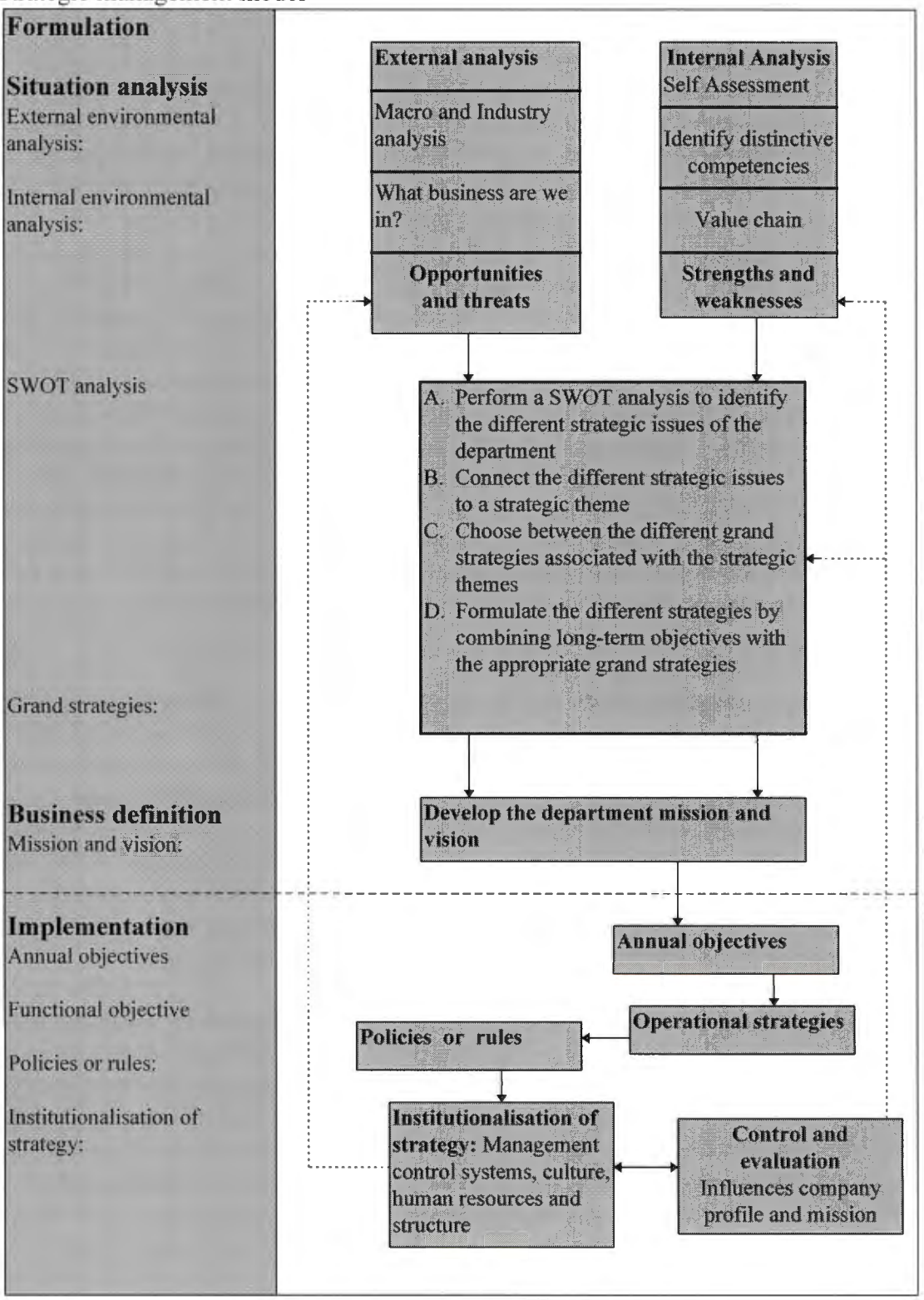
Viewing strategic management as a process means that the different activities in the structure, shown in figure 2.2, affect each other. The structure shows that formulation and implementation activities are sequential and feedback can influence the formulation phase after implementation. Thompson and Strickland (1996:14) also agrees that viewing strategic management as a process has the effect that nothing about the strategic management process is final - all prior actions are subject to modification as conditions in the surrounding environment change and ideas for improvement emerge.

The strategic management process undergoes continual assessment and subtle updating. Although the elements of the basic strategic management model rarely change, the relative emphasis that each element receives varies with the decision makers who use the model and with environmental changes.

2.7 The strategic management model

The strategic management model lends structure to the strategic management process. The output of the model will be strategies tailored for ETD.

Figure 2.2
Strategic management model



Source: Adapted from Pearce and Robinson 1991: 12 **and** Dearden & Govindarajan 1997: 256.

Companies with multiple products, markets, or technologies tend to use different strategic management systems. Despite differences in detail, the basic components of the models used to describe strategic management processes are very similar. Because of this similarity, it is possible to develop a model representing some of the views of experts in the strategic management field.

The following are the activities in the three phases of the strategic management process

Formulation

1. Asses the company's external environment, including both the competitive and general contextual factors.
2. Perform an internal analysis that determines ETD's internal conditions and capabilities.
3. Identify the various strategic issues of ETD by using the different strengths , weaknesses, opportunities and threats.
4. Connect the different strategic issues to a strategic theme.
5. Choose the appropriate grand strategies associated with each strategic theme.
6. Strategy formulation.
7. Define the mission and vision for ETD.

Implementation (Future deployment)

8. Develop annual objectives and short-term strategies that are compatible with a selected set of long-term objectives and grand strategies.
9. Implement the strategic choices by means of budgeted resources allocations in which the matching of tasks, people, structures, technologies, and reward systems are emphasized.

Evaluation (Future deployment)

10. Evaluate the success of the strategic process as an input for future decision making.

As these ten activities indicate, strategic management involves the planning, directing, organizing, and controlling of a company's strategic-related decisions and actions.

Activities 1 to 8 in the strategic management process cover the strategy formulation phase of the strategic management process. Activities 8 to 10 covers the implementation and evaluation phases of the strategic management process. The formulation of strategy is interconnected with the implementation and evaluation phases of the strategic management process. Because of the dynamic environment in which business is performed, it is necessary to mention the implementation and evaluation activities as they influence the formulation phase of the strategic management process.

2.8 Different stages of strategic management

Strategic management consists of:

- the formulation of strategy (developing the strategy),
- the implementation of strategy (putting strategy into action), and
- strategy evaluation and control (modifying either the strategy or its implementation to ensure that the desired outcomes are obtained).

As stated in the scope of objectives, the only part of the strategic management process that will receive detailed attention will be the formulation of strategy. The implementation and evaluation aspects of the strategic management process will only be mentioned to show their influence on the formulation activities of the strategic management process.

2.9 Strategy formulation

McClelland (1994:5) acknowledges the statement that strategy formulation is a means by which an organization develops a course of action so as to achieve specific objectives which are considered mandatory if the organization is successfully to compete in the marketplace.

The formulation of strategy, as applied in this study, can be divided into:

- Situational analysis
- Identify strategic issues using a modified SWOT method
- Connecting strategic issues to strategic themes
- Choose appropriate grand strategies of each strategic theme
- Formulate strategies
- Prioritise different strategies
- Define the mission and vision for ETD

2.9.1 Situation analysis

a) Define business environment

An important first step is to analyse and determine the business ETD is in. Gordon (1997:7) supports this in acknowledging that asking the 'right' questions early on, based on thinking strategically, is critical to the well-being of any unit of company, no matter the absence of fully obtainable answers. One of the right questions are: "What business are we in?".

- **Define the *business*.** ETD must ask themselves the question: what business are they in? The business ETD believes it is in determines who it sees as its customers, its competitors, its competitive advantage, and other relevant considerations. Importantly, when defining your business it forces you to look at the success factors of the industry and it affects how you compete in that industry.

b) External environmental analysis

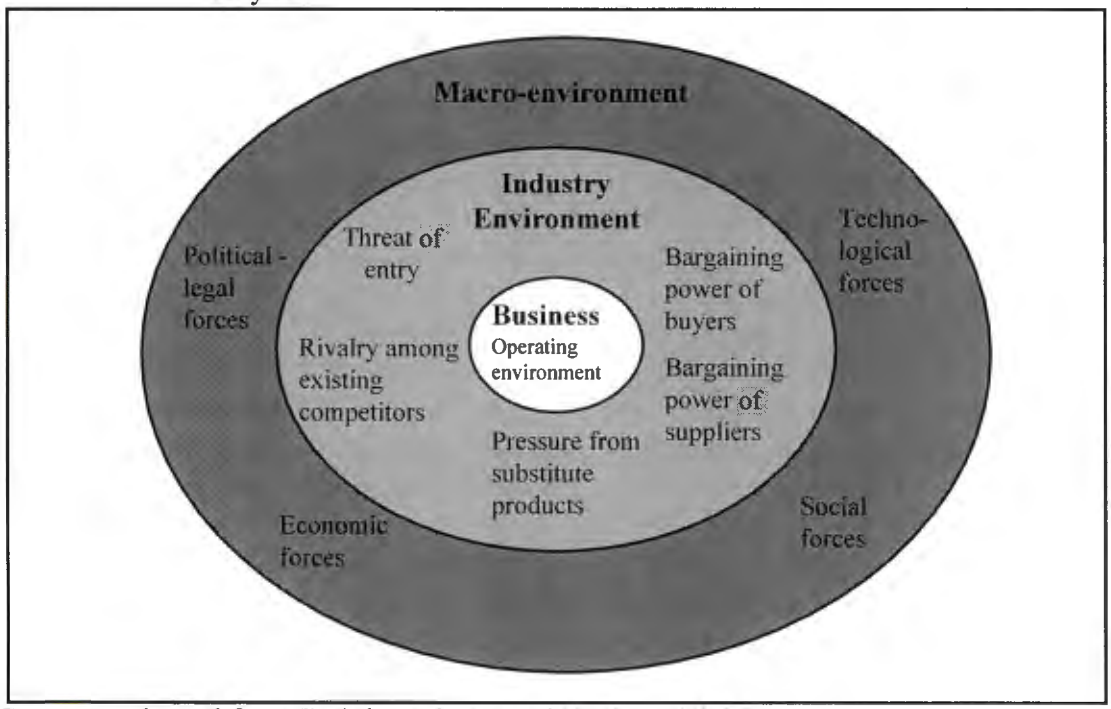
Analysis is the critical starting point of strategic thinking
Kenichi Ohmae (unknown date)

Crafting a strategy is an analysis-driven exercise, not just an activity performed through good intentions and creativity. Thompson and Strickland (1996:59) supports this statement when recognising that managers will be ill-prepared for the task of choosing a direction for the company to head or a strategy to get it there without first analysing the company's present situation - what external conditions it faces and what its capabilities are.

The biggest situational considerations (see figure 2.3) are:

- industry and competitive conditions (these are the heart of a single-business company's "external environment") and
- a company's own internal situation and competitive position

Figure 2.3
Three levels of analysis



Source: Adopted from Wright, Pringle and Kroll, 1994:22.

Industry and competitive analysis looks broadly at a company's external macro-environment; company situation analysis concerns a company's immediate micro-environment.

A host of external factors influence a company's choice of direction and action, and ultimately, its organisational structure and internal processes. The factors which constitute the external environment, can be divided into:

- Macro-environment
- Industry environment

i) Macro-environment

The macro-environment comprises factors that originate beyond, and usually irrespective of, any single company's operating situation - economic, social, political, technological and ecological factors. This environment presents organisations with opportunities, threats, and constraints but rarely does a single company exert any meaningful reciprocal influence.

ii) Industry environment

The word industry indicates a group of organisations whose products have so many of the same attributes that they compete for the same buyers/customers. Because industries differ significantly in their basic character and structure, industry and competitive analysis begins with an overview of the industry's dominant economic characteristics. The following factors are normally considered in conducting an industry analysis:

1) The industry's dominant economic characteristics

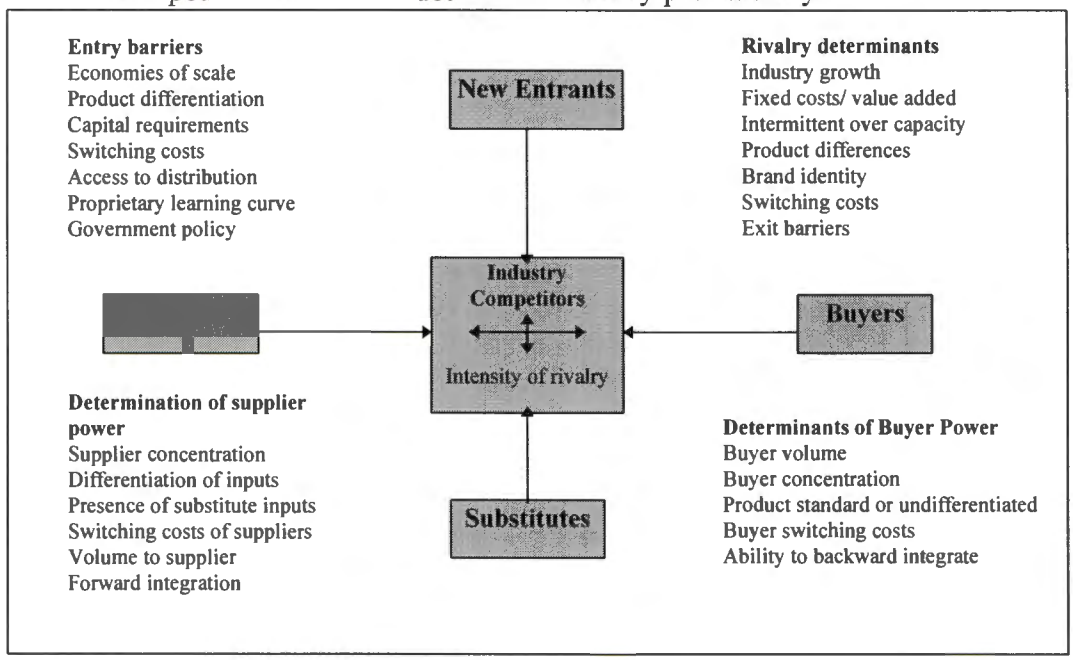
- Market size
- Scope of competitive rivalry (local, regional, national, international, or global).
- Market growth rate and where the industry is situated in the growth cycle.
- Number of rivals and their relative sizes.
- The number of buyers and their relative sizes.
- The prevalence of forward and backward integration.
- Ease of entry and exit.
- The pace of technological change.
- Whether the products of rival organisations are highly differentiated .
- Whether companies can realise scale economies.
- Whether the industry has a strong learning experience curve effect.
- Capital requirements.
- Whether industry profitability is above/below par.

2) Evaluating industry competitive forces

The first fundamental determinant of a company's profitability is industry attractiveness. Competitive strategy must grow out of an understanding of the rules of competition that determine an industry's attractiveness.

The ultimate aim of competitive strategy is to cope with and, ideally, to change those rules in the organisations favour. In any industry, whether it is domestic or international or produces a product or a service, the rules of competition are embodied in five competitive forces (see figure 2.4).

Figure 2.4
The five competitive forces that determine industry profitability



Source: Adopted from Michael E. Porter 1985:6.

According to Thompson and Strickland (1996:64) these forces are:

- The rivalry among competing sellers in the industry - Competitive jockeying among rival organisations is a dynamic, ever-changing process as organisations initiate new offensive and defensive moves and emphasis swings from one mix of competitive weapons to another.

- The competitive force of potential entry - The competitive threat that outsiders will enter the market is stronger when entry barriers are low, when incumbent organisations are not inclined to fight vigorously to prevent a newcomer from gaining a market foothold, and when a newcomer can expect to earn attractive profits.

  There are several types of entry barriers: Economies of scale, inability to gain access to technological and specialised know-how, the existence of learning and experience curve, brand preferences and customer loyalty, capital requirements, cost disadvantages independent of size, access to distribution channels, regulatory policies, tariffs and international trade restrictions.

- Competitive pressures of buyers - Buyers have substantial bargaining leverage in a number of situations. The most obvious is when buyers are large and purchase a sizeable percentage of the industry's output. The bigger the buyers are and the larger the quantities they purchase, the more clout they have in negotiating with sellers. Buyers also gain power when the costs of switching to competing brands or substitutes are relatively low.

- Competitive pressures from substitute products - The competitive threat posed by substitute products is strong when prices of substitutes are attractive, buyers' switching costs are low, and buyers believe substitutes have equal or better features.

- The power of suppliers - The suppliers to a group of rival organisations are a strong competitive force whenever they have sufficient bargaining power to put certain rivals at a competitive disadvantage based on the prices they can command, the quality and performance of the items they supply, or the reliability of their deliveries.

The collective strength of these forces determines the ultimate profit potential of an industry. When entry to a certain industry is unrestricted the prospects for long-run profitability are weaker. The weaker the forces collectively, however, the greater the opportunity for superior performance.

Whatever their collective strength, ETD must evaluate its current position in the industry and determine how they can best defend themselves against these forces or can influence them in their favour.

Knowledge of these underlying sources of competitive pressure provides the groundwork for a strategic agenda of action. They highlight the critical strengths and weaknesses of ETD, improve the positioning of ETD in its industry, clarify the areas where strategic changes may yield the greatest payoff, and highlight the places where industry trends promise to hold the greatest significance as either opportunities or threats.

3) Evaluate the changing industry structure

Industry conditions change because important forces are driving industry participants (competitors, customers, or suppliers) to alter their actions. These underlying driving forces are the major underlying causes of changing industry and competitive conditions.

4) Strategic moves by rivals

For ETD to be successful, they need to determine who their main competitors are - understanding their strategies, watching their actions, sizing up their strengths and weaknesses, and trying to anticipate what moves they will make.

5) Key factors for competitive success

An industry's key success factors (KSF's) are strategy-related action approaches, competitive capabilities, and business outcomes that every company must be competent at doing or must concentrate on achieving in order to be competitively and financially successful.

6) The attractiveness and prospects of the industry

The final step of industry and competitive analysis is to review the overall industry situation and develop reasoned conclusions about the relative attractiveness or unattractiveness of the industry, both near-term and long-term. After the industry environment analysis has been completed it must be reported in a format that provides the pertinent facts and conclusions of industry and competitive analysis. It pulls the relevant concepts and considerations together in a systematic fashion and makes it easier to do concise, understandable analysis of the industry and competitive environment.

c) Opportunities and threats

The industry opportunities most relevant to a particular company are those that offer important avenues for profitable growth, those where a company has the most potential for competitive advantage, and those which the company has the financial resources to pursue.

Certain factors in a company's external environment can pose a threat to its well being. Threats can stem from the emergence of cheaper technologies, rivals' introduction of new or better products, the entry of low-cost foreign competitors into a company's market stronghold, new regulations that are more burdensome to a company than to its competitors, vulnerability to a rise in interest rates, the potential of a hostile take over, unfavourable demographic shifts, adverse changes in foreign exchange rates, political upheaval in a foreign country where the company has facilities, and the like.

d) Internal environmental analysis

Strategic success is known to come from a consistent strategy relating to the competitive environment, *realistic* requirements placed on a company's internal capabilities, and a carefully executed strategy.

To realistically commit itself to a strategic plan, ETD must assess the attributes it possesses that enables it to effectively act on a particular opportunity in the competitive environment. Not only are strengths important but the limitations of the company should also be considered. Commitments made with realistic capabilities ensure an effective strategic exercise.

i) Engineering Technology Development (ETD)

1) ISCOR flat products organisational chart

This section depicts the ISCOR flat products organisational structure. It shows the different functional areas within the company and includes the engineering department as part of the structure. The structure supplies valuable insight into the different management levels constituting the top management of ETD.

2) The engineering technology value chain

The department's value chain identifies the primary activities that create value for customers and the related support activities; value chains are the tool for thinking strategically about relationships among activities performed inside and outside ETD-which ones are strategically-critical and how core competencies can be developed.

ii) How well is the current strategy working?

It is important to determine if ETD has a strategy at all ? Are there any data available to measure the performance of ETD in terms of the previous strategy? Does the old strategy comply with the changing company environment?

iii) Self assessment

In the attempt to formulate a strategic route for ETD, it is important to realise that ISCOR will only concentrate on core competencies and capabilities. The department has identified process automation as a core competency, but this does not relieve the department from its responsibility to deliver a cost effective, professional service equal to that of companies operating in the global process automation industry. Thompson and Strickland (1996:108) are supporters of the practice that a company should benchmark itself against competitors on all strategically and competitively important aspects of its business. For this reason the engineering technology development department has decided to assess their competencies against the requirements of an "excellent business" to enable them to effectively address the current change process at ISCOR.

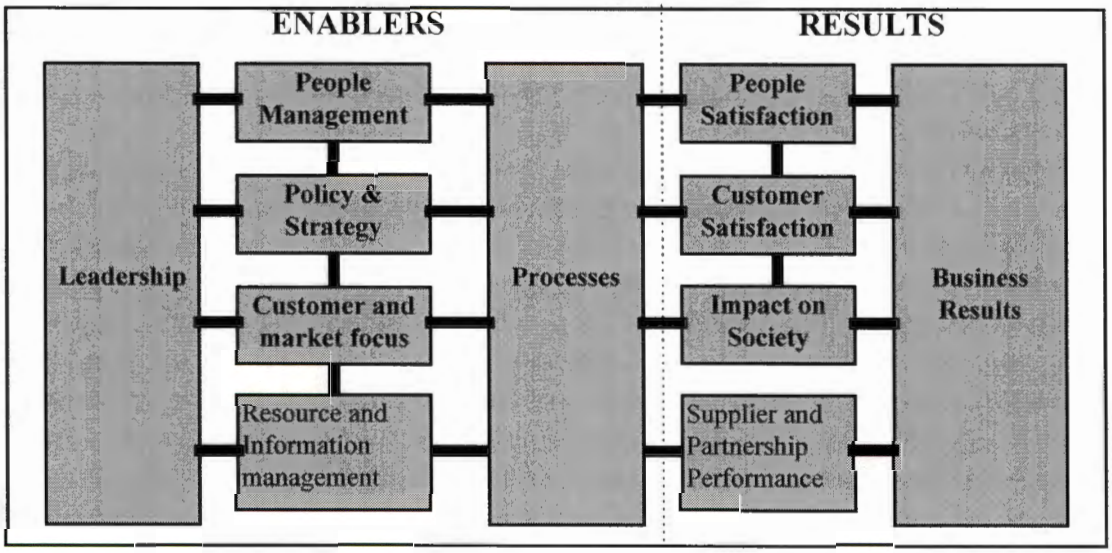
A broad ranging process called *self assessment* will be used to evaluate the departments competitive position. This technique is a powerful diagnostic tool which will help the department to assess its current internal mechanics and determine global strengths and weaknesses. Self-assessment has been shown to have many benefits. It will help to,

- identify and recognise both the department's strengths and areas of improvement
- consider how to build on and extend or strengths and successes,
- focus the departments efforts and resources to increase their success as a department and as individuals,
- enable more effective benchmarking by providing a basis for comparison between the department and recognised "world class" organisations,
- achieve a common sense of purpose and direction, based on a shared view of what needs to be done, and
- link what the department needs to do and how they need to do it with what they need to achieve.

The business excellence model (see figure 2.5) is a framework for assessing the "excellence" of an organisation. The model is based on the concept that an organisation will achieve better results by involving all the people in the organisation in the continuous improvement of their processes.

Self-assessment using a model or framework is not a new idea. Similar models have been in use in America, Europe, Japan and in many leading companies on a global basis.

Figure 2.5
The South-African business excellence model (SABEM).



Source: Business Excellence South-Africa 1998: 6.

ENABLERS - What the employees do to run their department. How they operate.

RESULTS - What the department achieve as seen by those who have an interest in the department; customers, employees of the department, the community at large and those who champion the functions of the department. How the department measures and targets achievement.

OVERALL - The eleven criteria of the SABEM are linked by the principle that:

> "**Customer Satisfaction, People** (employee) **Satisfaction, Impact on Society** and **Supplier and Partnership Performance** are achieved through **Leadership** driving **Policy and Strategy, People Management, Customer and Market Focus, Resource and Information Management** and **Processes** leading ultimately to excellence in **Business Results**"

The South African Business Excellence Model was developed by the South African Business Foundation (SABEF) in 1997, and builds on experience of the Malcolm Baldrige National Quality Award (MBNQA) (USA) and the European Foundation for Quality Management (EFQM) (EU). The SABEM model has been adopted throughout the Southern African Development Community (SADEC) countries and is duly recognised by both MBNQA and EFQM.

e) Strengths and weaknesses

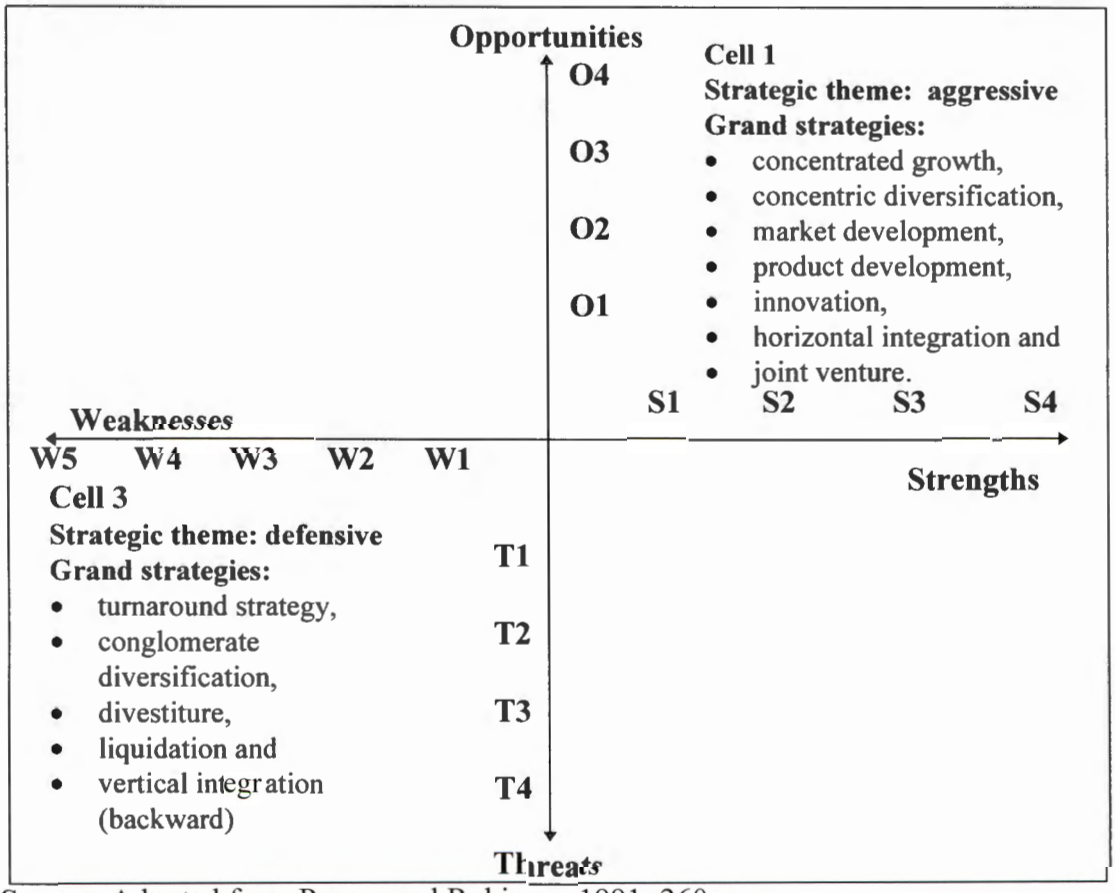
A strength is something a company is good at doing or a characteristic that gives it an important capability. A strength can be a skill, important exercise, a valuable organisational resource or competitive capability, or an achievement that puts the company in a position of market advantage.

A weakness is something a company lacks or does poorly (in comparison to others) or a condition that puts it at a disadvantage. A weakness may or may not make a company completely vulnerable, depending on how much the weakness matters in the marketplace.

2.9.2 Identify strategic issues

The next step in the strategic management process is the identification of strategic issues using a modified strengths, weakness, opportunities and threat (SWOT) analysis.

Figure 2.6
The proposed SWOT analysis graph



Source: Adopted from Pearce and Robinson 1991: 260.

The SWOT analysis will be used in combination with the model of grand strategic clusters as developed by Pearce and Robinson (1991:260). Figure 2.6 shows the SWOT graph that will be used to identify the different strategic issues of ETD. Only

cells one and three will receive attention because they will constitute the most important issues identified by ETD. These issues will enable ETD to strengthen their core capabilities and address their weaknesses to ensure that ETD does everything possible to remain a valued and cost competitive entity within ISCOR.

Strategic issues are identified by linking different opportunities, strengths, weaknesses and threats together. Opportunities and strengths are linked together to allow ETD to concentrate on activities and competencies that will enable them to effectively address future opportunities. Weaknesses and threats are linked together to allow ETD to effectively address weaknesses that combined with certain threats may constitute possible death threat scenario's for ETD.

2.9.3 Connecting strategic issues to strategic themes

The strategic themes have been included in the corresponding cells of the SWOT graph. In cell one opportunities and strengths are linked together to allow ETD to concentrate on activities and competencies using aggressive strategies. In cell three weaknesses and threats are linked together to allow ETD to effectively address strategic weaknesses with the help of defensive strategies. A strategic theme is now connected to all the strategic issues identified.

2.9.4 Each strategic theme suggests certain grand strategies

Each strategic theme suggests certain grand strategies. Grand strategies, often called master or business strategies, provide basic direction for strategic actions. They are the basis of co-ordinated and sustained efforts directed toward achieving long-term business objectives.

To help managers develop their strategic direction, Pearce and Robinson (1991:227) defines 12 principle grand strategies.

a) Concentrated growth

Concentrated growth is the strategy that directs resources to the profitable growth of a single product, in a single market, with a single dominant technology. Concentrated growth strategies have proven to be successful because of several reasons. The greatest influences on market success are those characteristics of organisations that implement a concentrated growth strategy. These influences include the ability to assess market needs, knowledge of buyer behaviour, customer price sensitivity, and effectiveness of promotion.

A major misconception about concentrated growth strategies are that the organisation practising them will settle for little or no growth. This is not true for organisations that correctly utilise the strategy. An organisations using concentrated growth grows by building on its competencies and achieves a competitive edge by concentrating on the product-market segment it knows best.

b) Market development

Market development commonly ranks second only to concentrated growth as the least costly and risky of the 12 grand strategies. It consists of marketing present products or services, often with only slight modifications, to customers in related market areas by adding channels of distribution or by changing the content of promotion and advertising.

Market development allows organisations to practice a form of concentrated growth by identifying new uses for existing products or services and defining new markets.

c) Product development

Product development involves the substantial modification of existing products or services or the creation of new but related products or services that can be marketed to current customers through established channels.

d) Innovation

The rationale of the innovation grand strategy is to create a new product life cycle and thereby make similar existing products or services obsolete. Thus, this strategy differs from the product development strategy of extending an existing product's life cycle.

e) Horizontal integration

When an organisations long-term strategy is based on growth through the acquisition of one or more similar organisations operating at the same stage of the production-marketing chain, its grand strategy is called horizontal integration.

f) Vertical integration

When an organisations grand strategy is to acquire organisations that supply it with inputs (such as raw materials) or are a customer for its outputs (such as warehouse for finished products), vertical integration is involved.

g) Joint venture

Occasionally two or more capable organisations lack a necessary component for success in a particular competitive environment. The solution can be a partnership or joint ownership where the competitive strengths of these two organisations are brought together to form a better competitive force in the marketplace.

h) Concentric diversification

Concentric diversification involves the acquisition of businesses that are related to the acquiring organisation in terms of technology, markets, or products.

i) Conglomerate diversification

Often an organisation, particularly a large one, plans to acquire a business because it represents the most promising investment opportunity available. This grand strategy is commonly known as conglomerate diversification. The principle difference between the two types of diversification is that concentric diversification emphasises some commonality in markets, products, or technology, whereas conglomerate diversification is based principally on profit considerations.

j) Turnaround

Turnaround strategy has to do with reversing the current negative trends present at an organisation. There can be a number of reasons why there is negative trends present at an organisation. In many cases, strategic managers believe such organisations can survive and eventually recover if a concerted effort is made over a period of a few years to fortify its distinctive competencies.

k) Divestiture

A divestiture strategy involves the sale of an organisation or a major component of an organisation.

l) Liquidation.

When liquidation is the grand strategy, the organisation is typically sold in parts, only occasionally as a whole, but for its tangible asset value and not as a going concern.

2.9.5 Choose grand strategies for each strategic issue

The next step is to choose the appropriate grand strategies that will be used to address each of the identified issues. These choices will be made taking into account all the relevant information obtained in the internal and external environmental analysis.

2.9.6 Strategy formulation

Any one of the grand strategies could serve as the basis for achieving the major long-term objectives of the department. The formulated strategies will consist of a combination of long-term objectives and grand strategies addressing the different strategic issues identified.

2.10 Define the mission and vision for ETD

Renton (1997:19) makes the point that most mission statements now incorporate three key elements:

- Mission (or purpose we fulfil);
- Vision (or image we strive for); and
- Values (or beliefs we live by).

Although these elements are not always separated neatly, there are advantages in doing so. These advantages will be discussed in the following sections.

2.10.1 Mission statement

The company mission is defined as the fundamental unique purpose that sets it apart from other companies of its type and identifies the scope of its operations in product and market terms.

Defining the mission is essentially a strategic (territorial or directional) issue. Thompson and Strickland (1996:27) support the statement that there is a place for mission statements in functional departments. Every department can benefit from a, widely accepted statement spelling out its contribution to the company's mission, its principal role and activities, and the direction in which it needs to be moving. The fundamental unique purpose of the department and the scope of its operations is a result of the preceding activities, as well as the internal and external environmental analysis, in the strategic management process.

Pearce II and David (1987:109) suggest in their publication that their are eight key components of mission statements:

1. The specification of target customers and markets.
2. The identification of principal products/services.
3. The specification of geographical domain.
4. The identification of core technologies.
5. An expression of commitment to survival, growth, and profitability.
6. The specification of key elements in the company philosophy.
7. The identification of the company self-concept
8. The identification of the company's desired public image.

Bart (1997:9) acknowledges the fact that the power of mission statements resides in their ability to achieve two key results (1) to inspire and motivate organisational members to exceptional performance that is, to influence behaviour: and (2) to guide the resource allocation process in a manner that produces consistency and focus.

These desirable results can be accomplished by providing a sense of purpose and direction, to ensure that the interests of key stakeholders are not ignored, sharpening the company's (business) focus, enabling better control over employees and promoting shared values and behaviour standards.

2.10.2 Vision statement

Renton (1997:20) states that defining the vision and values of the department are really operational and implementation issues. The first is the, "face-driven", who statement and the second is the, "heart-driven", how statement. Together they reveal a great deal about the culture, or personality, that the organization would like to (or sometimes does) have.

" During my lifetime I have devoted myself to the struggle of the African People. I have fought against White domination, and I have fought against Black domination. I have cherished the ideal of a democratic and free society in which all persons live together in harmony and with equal opportunities. It is an ideal which I hope to live for and achieve. But if needs be, it is an ideal for which I am prepared to die ".

Nelson Mandela - 1964

A vision is all about a better world ahead that we want to be part of and be proud of. One is unlikely to find a better example of a vision than the above quote made by Nelson Mandela in his closing speech at the Rivonia Treason Trial.

It is important to note that the vision statement does not cover the steps to be taken to achieve a future objective. It is rather a statement of the end objective or the image the company wants to project at the end of its strategic activities.

An effective and well-developed vision statement is characterised by the following:

- It is symbolic, providing a common frame of reference, identification and commitment
- It is short ... one or two sentences
- It expresses a dream. However, an intelligent dream
- It is expressed as an end result ... a desired destination

Values can be identified as core beliefs about effective business practices, guidelines for behaviour and on-going priorities for management and employees.

Topics typically covered in value statements are the importance of customers and customer service, commitment to quality, commitment to innovation, respect for the individual employee, the duty the company has to employees, importance of honesty, integrity, and ethical standards, duty to stakeholders and the importance of protecting the environment.

2.11 Conclusion

This chapter defined strategy and discussed the nature and value of strategic management. Relevant information including the levels of strategy and who takes part in the strategic management process were presented.

To ensure the timely execution and success of strategic management, it must be in the form of a structured process. Structure is given to the process by a model shown in figure 2.3 of this document. This model identifies the different stages of strategic management process. This dissertation will however only concentrate on the formulation phase of the strategic management process.

Chapter 3 of this document presents the results of the practical application of the strategic management model.

CHAPTER 3
PRACTICAL APPLICATION OF THE STRATEGIC MANAGEMENT MODEL

3.1 Introduction

Chapter 2 introduced a model, called the strategic management model. This model, completed in three phases, describes and provides structure to the strategic management process. The strategy formulation phase will now receive further attention in this dissertation.

Chapter 3 is the result of the practical application of the strategy formulation phase, for ETD, through the use of the strategic management model.

The formulation phase, as described in the model, consists of:

- a situation analysis,
- the identification of strategic issues using a modified SWOT analysis,
- connecting strategic issues to strategic themes,
- choosing appropriate grand strategies from each strategic theme,
- strategy formulation and
- defining the mission and vision of ETD.

3.2 Situation analysis

3.2.1 Business environment

The process automation industry is the primary industry wherein ETD operates. The boundaries of this industry is defined as:

- process control,
- process optimisation,
- management information, and
- related services.

Part of the service provided by ETD includes process control competence. This competency includes capabilities in the following areas:

- instrumentation,
- mass measurement,
- gas analysis,
- electrical distribution (low and medium voltage range),
- electric drives,
- electrical field equipment,
- Programmable Logic Control (PLC) and
- Distributed Control Systems (DCS).

The booming computer industry, integration of plant-floor automation with office automation and the application of information gathered from the production process into businesses is all having an impact on the process automation industry. ETD is aiming at extending their service to include competence in the management information area by building capabilities in the areas of:

- management information systems and
- manufacturing execution systems.

ETD has substantial experience in steel manufacturing process technologies. This experience is used to facilitate the optimising of the manufacturing process through a contribution in the areas of:

- process modelling,
- expert systems and
- neural networks.

Finally, the service ETD provides includes capabilities in the areas of:

- project management,
- specialised maintenance,
- consulting services and
- development of plant and processes.

The items listed above also define the industry boundaries in the process automation field in more detail.

3.2.2 External environmental analysis

3.2.2.1 Macro-Environment

a) Economic Factors

This section evaluates the economic factors facing ETD by focussing on:

- the general South-African and international economic outlook,
- the economic outlook for the base metal sector and
- the economic outlook for the steel industry.

i) General economic outlook (August 1998)

1. Domestic

The interest rate cycle that has been in a downswing phase since the beginning of 1997 has since reversed following a turmoil on the domestic and other emerging currency markets. The rand came under downward pressure since late May 1998 and has subsequently weakened by over 30% against the US dollar. The Reserve Bank intervened by raising short-term interest rates with

the repossession (repo) rate and the marginal lending rate increasing to record highs of 24% and 43% respectively. The risk for further weakening of the rand against the US dollar remains as perceptions grow that the government is slow to implement its Growth, Employment and Redistribution Strategy (GEAR).

The immediate impact of the increases on short-term interest rates is that both consumer and business spending are expected to decline and the economy will rely on an improved export performance to prevent a decline of becoming a recession. Domestic exports are expected to benefit from a depreciated rand, the economic recovery currently underway in Western Europe and the strong performance of the US economy. *Higher interest rates are also expected to lead to a delay and/or cancellation of both private and public fixed investment spending.*

A tight and vigilant monetary policy has ensured the maintenance of producer inflation at under 3,0%. The depreciation of the rand against the US dollar as well as the recent recovery in world oil prices is expected to exert upward pressure on the imported inflation component. Locally, inflation is expected to benefit from a slowing economy as well as the increase in competitive forces generated by a more open economy.

2. International

International growth in the developed world continues to remain un-synchronised with the US and the UK registering strong growth performance. Western Europe's economic recovery is currently in place led mostly by an improved export performance. This improved export performance has also been boosted by the weakness of key European currencies (led by the D-Mark) against the US dollar. The Japanese policy makers are still struggling to kick start the domestic economy following the announcement of another economic stimulus package in March 1998. Japan is expected to register negative growth during the current year. The consolidation process underway in Asia was also negatively affected by the recent turmoil in currency markets of emerging economies.

International commodity prices remain depressed with the Economist All Metal $ Price Index falling by nearly 10% during the second quarter of 1998 compared with the first quarter of the same year. *In the absence of any synchronised growth among the major economic regions, commodity prices are expected to remain under downward pressure.*

ii) Economic outlook for the base metal sector in South-Africa

The base metals sector covers the transformation of mining products, fine refining, alloying, casting, sheet and foil rolling. The scope of the sector ends with metal transformation into standard metal materials, which are further processed by the metal product sector.

1. General economic issues.

1995 sales turnover in the base metals sector amounted to R27 301 million, which constituted some 3% of the total sales in South-Africa from the same year. The total GDP at factor cost for the sector amounted to R10 280 million in 1995, which contributed 3.2% to the total economy. Econometric forecasts estimate the sector GDP to grow by 1% from the 1995 level to R10 390 million in 1998.

According to forecasts, growth in the base metal sector has been improving over the last 2 years with the sector weighted annual growth rate estimated to be 3.6% over the period 1995-2000. Capital expenditure that has been committed in the sector totals some R9-billion up until the year 2002, with a further R17-billion expenditure being considered through feasibility studies, especially in the aluminium and iron and steel industries.

New capital projects in the sector includes ISCOR developments in Gauteng of R1.2-million and R1000-million respectively.

The export sales for companies in the base metal sector amounts to 54% of the sector sales. The majority of the products are exported to Europe, North America and Asia- Australia.

The economic activity in the base metals sector although showing an upward trend in the medium term, is set to be buffered further by industry optimism as sales turnover increases in the short term.

iii) Economic outlook for the steel industry

The economics of the steel industry has an effect on this dissertation and its contents. In this period of change the ISCOR market will be the most attractive market for ETD mostly because of the its extensive knowledge of the steel industry and its operations. For that reason it is important to concentrate on the economic outlook for the steel industry.

The following factors have a significant effect on the future attractiveness of the steel industry:

1. Domestic market

- Decline in the demand for steel products from the mining sector expected to continue during the short-term.
- With the exception of the domestic appliances industry, total despatches to the manufacturing industry are expected to decline.
- Punitive interest rates are curtailing activities in the building and construction sectors.

Table 3.1
Current business conditions in international steel demand

Sector	Current business conditions	Decrease	Sideways	Increase
Total steel consuming industries	Below average	X		
Furniture	Poor	X		
Mining	Poor	X		
Bolts, nuts etc.	Poor	X		
Automotive	Poor	X		
Basic iron and steel industry	Poor	X		
Cables and wire	Poor	X		
Railroad equipment	Poor			X
Agriculture	Average	X		
Manufacturing	Average	X		
Pipe industry	Average	X		
Plate and sheet metal works	Average	X		
Building and construction sector	Average	X		
Merchants	Average	X		
Packaging	Average		X	
Electrical apparatus	Average		X	

Source: ISCOR economic brief August 1998.

- Merchants are also experiencing a decline in demand.
- Steel imports remain on high levels.
- Total steel demand is expected to decline further during the short-term.
- An improvement in total steel demand is only expected during the latter half of 1999 as unstability of the financial markets is impeding business and consumer confidence.

2. International market

- US economy in its seventh consecutive year of expansion.
- European Union countries are experiencing relatively buoyant conditions in steel consuming sectors.
- Asian steel prices continue to decline.
- Steel demand in South American countries are also under pressure.

b) Social Factors

A social issue that may influence the market environment is the affirmative action policy being sponsored by the government. Affirmative action must be taken into account as a part of future business interactions in the market. Its influence on business and especially the gaining of new business, where black development companies are potential clients, must be taken into account.

Another aspect of society today is the growing number of skilled people leaving the industry and country. People are leaving the country due to reduced career opportunities. This could be attributed to especially affirmative action policies driven by government and also the growing incidence of violence in the country.

c) Political Factors

The government's GEAR program will receive a lot of attention especially with elections coming up next year.

Important aspects to bear in mind will be the rights of workers, affirmative action policies and legislation, restructuring of government organisations, the effect of unions on the market environment and environmental laws.

d) Technological Factors

The process automation industry can be divided into the hardware and related services sections. The hardware section consists of the different vendors of physical process automation equipment, whereas the service section adds value to the hardware and provides the customer with a complete process automation solution.

The booming computer industry, the application of production information to the business and the integration of plant-floor automation with office automation are all factors having an impact on the process automation industry today.

Organisations in South Africa are also very proactive in the implementation of new process automation and control equipment innovations. Usually, these innovations are only considered after a period of service in overseas markets. It is important to actively monitor the overseas technological environments (USA and France) where it concerns the steel industry to be able to plan important future process automation strategies thereby providing our clients with an edge over their international competitors.

e) Ecological Factors

There is improved and visible action from government to enforce new environmental laws. Companies competing in competitive markets cannot afford to disregard the rights of people to live and work in clean environments. To ignore environmental issues will be to ignore a significant threat to an organisation.

3.2.2.2 Industry environment

a) Dominant economic characteristics

To get an overview of the economic characteristics of the process automation industry, it is wise to look at the different industry sectors. Development in these sectors make money available for the process automation industry through capital

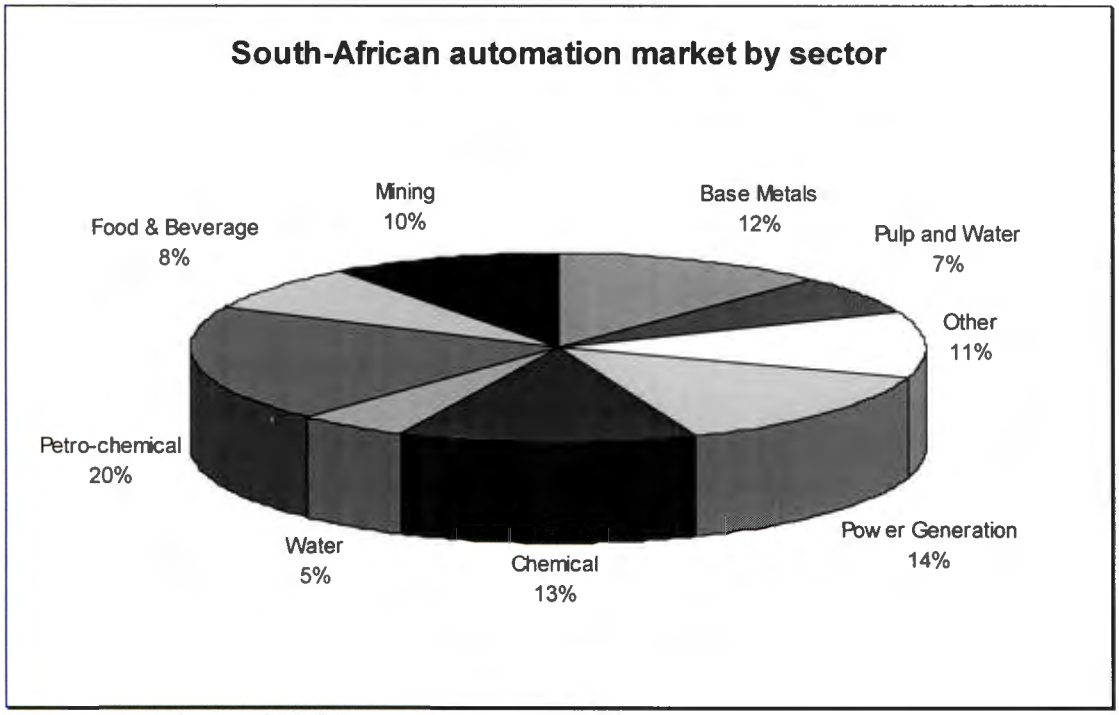
expenditure. Appendix B shows the different industries and the large projects planned by the industry sectors till the year 2002.

ETD has identified the base metal sector (mainly steel industry) as its primary market. It is however also important to review the different external markets and their economic characteristics.

i) External Markets

The South African process automation industry in worth about R1-billion a year. This figure excludes mechanisation and pure manufacturing such as automotive, fridge, electric and white goods.

Figure 3.1
The South-African 1997 automation market by sector



Source: Strydom. 1997:26.

The largest of the markets contributing to the R1-billion a year, are the petrochemical industry at R160-million, power generation at R120-million, chemical at R110-million, base metals at R100-million and mining at R90-million.

Good news for the process automation market is the fact that the internationally competitive market place will force companies competing there to be cost competitive. The strategic importance of process automation is now, more than ever, a critical success factor for companies as it provides quality, repeatability and efficiency.

The key drivers towards competitiveness in the base metals market appear to be productivity and low cost production process technologies that are able to produce goods efficiently, to stringent international quality standards.

ii) ISCOR market

The following are important long-term objectives based on ISCOR's competitive position, the slow international and local market growth and the maturity of its markets:

- strengthening of ISCOR's core competencies,
- securing suppliers of scarce resources,
- striving for a dominant market share,
- addressing a high level of capitalisation,
- increasing cost competitiveness and increasing efficiency,
- the implementation of cost cutting technologies,
- reductions in overhead and administrative expenses,
- product innovation and quality improvement,
- streamlining production processes,
- closure of marginal production facilities and outlets,
- adding new effective facilities and outlets and
- saving on maintenance and minimising new investments.

The general economic evaluation indicated the strategic significance of process automation and also indicates an increase in capital for automation in the base metal sector. Appendix C shows the capital expenditure planned for ISCOR for the next ten years. The calculations shows three possible scenario's. These are a pessimistic, most likely and optimistic scenario for capital expenditure on process automation at ISCOR. The pessimistic values are used due to the weak financial markets. The planned ISCOR capital expenditure on process automation can be quantified at an average of R56-million a year for the next 10 years. The calculations are only for the ISCOR Vanderbijlpark works.

Another key characteristic of the ISCOR market is the current change program. This program is called OPEX which is derived from the operational excellence program currently underway. This change program makes it possible for new thoughts and methods to be implemented. New ideas and a new way of doing things can only contribute to a new culture of operational excellence.

The implementation of the change program can have a negative impact on ETD. Contributors to the current operational problems are running the change process. This raises questions regarding the effectiveness of the change process which are characterised by uninformed decision making. A second possible negative influence is the short-term financial goals which are taking priority, over long term strategic thinking. Money saving service sections such as ETD are victims of uninformed and rash decision making which cascades undetected through the change process. There is confusion concerning the definition of multitasking and what constitutes core business and core capabilities.

A profile of the dominant economic characteristics of the process automation industry.

Market Size: R1-billion annual industry. **ISCOR market** about R56-million a year over 10 years.

Scope of Competitive Rivalry: Process automation is not very concentrated with a trend towards globalising in geographical as well as product spread terms.

Market Growth Rate: Expected 2% (difficult to predict). **Stage in Life Cycle:** Profit (early maturity) and technological (fast growing).

Number of Companies in the industry: Decline in bigger hardware suppliers , increase in system integrators including hardware suppliers merging to become complete solution providers.

Customers: Divided as shown in Figure 3.1. Target market of ETD is the steel industry. ETD's main customer is ISCOR flat products Vanderbijlpark Works

Degree of vertical integration: Low; the main drive is to outsource non-core activities. This study is a result of dealing with such moves. Other companies outsource their need for services.

Ease of Entry/Exit: Moderate entry barriers; Can survive on less capital intensive projects, but large amounts of capital are needed for bigger projects. Learning curve can help ETD in ISCOR. This is because of ETD's knowledge of current equipment and processes. Competing organisations have to include in their cost structures the cost to become familiar with ISCOR equipment and processes.

Technology/Innovation: Move to integrate plant floor automation with office automation. Improve the application of information gathered by automation into business. Rapid technological advances in computer processing is changing the market.

Product Characteristics: High level of specialisation. Differentiation by targeting specific markets such as the steel industry. Significant loyalty of customers to specific brands. Some customers also prefer certain service providers.

Scale Economies: Low; smaller companies can compete against larger companies because of the engineering component being dominant in the process automation industry.

Experience Curve Effects: Strong in companies that forward integrate. Companies born out of parent companies have a significant advantage in that specific industry. ETD will use this as a barrier to entry against competition.

Industry profitability: Good; . R9-billion future development capital already committed in the base metal industry. Companies including ISCOR must automate to stay competitive and internal process automation opportunities at ISCOR look good.

b) Competitive Forces

i) Rivalry among competing sellers

1. Process automation industry

The process automation industry consists of fiercely contesting and powerful companies. Some of the bigger companies previously sold more expensive DCS technology and made their profit on hardware sales. With the rapid change in technology the market is forcing profit margins down especially on hardware sales of DCS equipment.

This result may reflect the increasing popularity of PLCs in the process industries, now that PLCs are being equipped with continuous control capabilities. On the other hand it may simply indicate that PLC-based automation projects are more readily contracted out to systems integrators. DCS systems are often implemented for the end-user by the vendor's own in-house application engineering group, whereas PLCs can be purchased and installed by an independent system integrator with or without the vendor's involvement.

The various traditional DCS suppliers are now re-evaluating their product line and ultimately their business strategies. The latest trends indicate that more money will be made in the services and information sector of the industry. To enable these big companies to survive they are obtaining more of the newer technologies, through mergers, as part of their total product offering.

The resulting mergers enable bigger companies to provide a complete solution to the customer, thus defending their market share.

PLCs are also experiencing market pressure and it is estimated that there will be about 5 major role players left in the future. This can be determined by analysing the strategic moves by these companies to supply the customer with the right product for future use. These companies can be listed as General Electric, Rockwell, Schneider, Siemens and Mitsubishi.

2. ISCOR market (Vanderbijlpark)

ISCOR currently uses a tendering system to award process automation projects to outside companies. Big projects are handed over to external system integrators who sub-contract different equipment providers (if needed) to help complete the projects.

The internal market is contested by various external companies and various in-house process automation departments like ETD.

ETD has experience in the equipment used in the plants and an established working relationship with the ISCOR customers. This department has never

seen the internal ISCOR environment as a competitive marketplace. Until now there has never been a need to compete.

ii) Competitive threat of potential entry

External service providers are a threat to ETD. The seriousness of the threat by new entrants is determined by the barriers to entry that exist within the industry. The different barriers to entry are analysed and their effects on potential entrants examined.

1. Capital requirements

The size of process automation projects varies significantly, providing suitable opportunities for large and small firms. Even though it is possible to survive on smaller less capital intensive projects, insufficient capital will prevent one from competing for large process automation projects.

2. Cost disadvantages independent of size

Training on new technologies or systems may break down some of the barriers to the internal industry. It is a fact that a lot of industries are neglecting the training of their technical staff because of the perceived benefits of outsourcing certain functions. This can also create a barrier to entry for this department if it wants to compete in the external competitive marketplace.

Another low barrier is the limited access that the engineering department has to proprietary technologies

A barrier to entry for external service providers worth noting is the familiarity of line departments with the work of the engineering department. The engineering department is also well located to serve the Vaal triangle process automation market. Existing partnerships will be helpful in competing for a share in the industry environment.

3. Access to distribution channels

Access to effective distribution channels will provide an industry player with a competitive advantage. Significant emphasis is placed on service in the process automation industry and effective distribution forms part of this service. If the engineering department can position itself at the end of the distribution channel of a strong competitor in the external environmental process industry, it can establish a strong barrier to entry for new entrants to the internal market. A thorough understanding of the future of technology in the industry and the main role players supplying this technology must be some of the aspects helping the department to decide who to establish strategic partnerships with.

4. Government policy

As the foreign exchange rates fluctuate, so too does the cost of process automation equipment as, in general, it is not manufactured locally.

5. The existence of the learning curve effect

ETD can use the learning curve as a strong barrier to entry for the internal ISCOR market. Years of experience in the steel industry and first hand knowledge of the internal processes of the company will enable the department to be very cost competitive.

6. Brand preferences and customer loyalty

Some areas within the ISCOR internal market are in the process of standardising on certain equipment. Having extensive experience in applying this equipment can serve as a potential barrier to entry to external service providers not experienced with these specific products.

The advantage for ETD is the established links the department already has with these different customers within ISCOR. ETD can then establish loyalty from customers by delivering a professional service helping them to be more cost competitive. Having extensive know-how and knowledge of different customer operations will enable this department to establish an effective barrier to entry.

iii) The power of suppliers

Suppliers to ETD can be divided into technology suppliers, service suppliers and internal ISCOR suppliers. Technology suppliers typically supply hardware and software , training and support. External service suppliers can be seen as engineering contractors, system integrators and consultants on various issues. Internal suppliers can be summarised as the following:

- line sections,
- projects/ construction department,
- services department/ project planning department,
- quality assurance/ control department/ drawing office,
- capital buying and
- special expenditure control.

1. Technology suppliers

Except for the fact that the different line sections perceive the products/services supplied by specific hardware suppliers as being differentiated, the hardware suppliers as such are not really perceived as powerful suppliers. The problem with this is of course that the line sections

usually do not have any firm basis to substantiate this differentiation. But the hardware supplier has been able to build in substantial switching costs, both physically and mentally.

Where it concerns forward integration into the industry, it is worth noting that there is a distinct difference between the suppliers of PLC and DCS. The DCS suppliers usually engineer and install their own systems, whereas the PLC suppliers tend to move towards a system whereby they only supply the equipment and systems integrators engineer and install the systems.

A problem does appear as soon as you have decided on a particular hardware supplier as he immediately becomes a very powerful supplier where it concerns training and support as he is not obliged to contend with other suppliers in this arena.

2. Service suppliers

The external supplier groups do not really appear to be very powerful suppliers except in the case of forward integration into the industry, although it can be said that they are already in the industry.

The internal suppliers of services however are a completely different case. These are extremely powerful suppliers as they are not obliged to contend with other suppliers for the sale of their services.

iv) Power of customers

The main customers of ETD include the following:

- Production and maintenance departments, and
- Engineering Technology Line sections of the following plants:
  material handling plant, sinter plant, coke plant, blast furnaces, pulverised coal injection plant, direct reduction plant (Vanderbijlpark), direct reduction plant (Dunswart), oxygen steel making plant, electric steel making plant, foundry plant and ISCOR Vereeniging.

ISCOR Vanderbijlpark is an extremely powerful customer to ETD as they are our sole customers.

A customer is powerful if it lowers its purchasing costs due to economic pressure. The long term objectives of ISCOR Vanderbijlpark is. to become a low cost producer of steel through cost reduction and saving on administrative and overhead costs. With this in mind, these customers should be viewed as extremely powerful.

Although ETD is under the impression that their services do save the customer money they can, at least at this stage, not prove it. Thus, ETD must believe they do not save ISCOR money. This would seem to strengthen the position of ISCOR as a powerful customer.

There certainly is a possibility that the customers can start moving into the process automation industry with the increasing use of user friendly application tools, although this would be in direct conflict with the long term objective of strengthening the customers core competencies. Overall, ETD can judge its customers like ISCOR as powerful , although they might not be so powerful to the rest of the industry.

v) Competitive threat from substitute technology / services

For service departments it is suicide not to determine the emergence of new technologies and the needs of the customer. New technologies can enable a service provider to provide a complete solution to a client. The ever changing technological environment establishes new opportunities for service providers that are on track with new development. Not being aware of new technologies may enable external service providers to take market share from ETD.

Technologies to take note of:

- fieldbus & device networks,
- soft logic controllers,
- shift in focus from process control to Manufacturing Execution Systems (MES),
- fuzzy Logic,
- neural networks,
- expert systems,
- network computers or client/server architectures or internet and intranets, and
- SAP/R3

plant automation re-engineering,
networked organisations and
management by projects.

c) Industry structure and strategic moves by rivals

i) Driving forces changing industry structure

1. Changes in the process automation Industry

Tibbenham (1998:14) states that he is surprised at how many organisations have elected to utilise the services of specialised contractors for various in-house functions (in this case automation, instrumentation and control).

Why does a large, or for that matter any company decide to contract in the services of instrument engineers, system integrators and instrument maintenance technicians?

Perhaps because:

- the cost of retaining such skills in-house is now prohibitive,
- there are labour and union issues that become intolerable,
- the resources themselves are scarce, so they cannot be found or even enticed to stay and
- there is insufficient project work to keep them busy and stimulated.

Paying for these services on a monthly contract, fixed lump sum or turnkey basis is very attractive for a company. The perceived benefits include:

- reduced salary and training bills,
- pro-rata reduction in associated overheads,
- less trouble and trauma associated with having to find ways to keep the service department busy or prevent retrenchments arising from a lack of work,
- focuses the business and its permanent staff on core activities and
- improvement in service and problem response or customer support that one could expect to achieve from a competitive outsourcing arena.

What is important is the fact that ISCOR is busy cutting costs and aim to focus on *core competencies and core business only.* This raises an interesting debate over what constitutes core business and competencies and which segments can be classified as core and non core-business and competencies. If the current industry trends are anything to go by it seems that companies are willing to outsource process automation functions. These functions can be outsourced, thus acting in accordance with industry trends as discussed in a previous section.
Outsourcing seems to be an acceptable option when trying to reduce operating costs by only concentrating on *core competencies and core business.* More interesting is the fact that *core competencies* can include automation competencies. This brings up the topic of strategic outsourcing.

The theory of outsourcing, already discussed, may suggest to management that the way to realise lower cost solutions and address problem areas of business is to hand the problems over to outside contractors - as if this will make the problems magically disappear ("out of sight, out of mind"). Mariotti (1998:20) agrees that a number of myths have been promoted by some so-called outsourcing specialists. Here are 10 of them (along with the facts).

Myth 1: You can outsource whatever you want done with no investment. *Fact*: When you make no investment, you usually have neither equity nor ownership in what you get. You are just borrowing it.
Myth 2: If you don't have the necessary knowledge, you can buy it. *Fact:* Same answer: You aren't buying it, you're just renting it. And the competition can buy (or rent) the same knowledge, too - so what have you gained competitively?

Myth 3: You can buy market entry or market share more cheaply by using an outsource contractor's capability. *Fact:* Again, you are just borrowing or renting the capability, until competitors rent the same market position and add some unique value of their own.
Myth 4: It's easier to deal with fluctuations in staffing needs through outsourcing. *Fact:* Only if the contractor can find someone with counter-seasonal needs. Otherwise, there's no free lunch. You will pay for the downtimes as soon as the contractor discovers that it can't balance the demand, either.
Myth 5: There is no need for day-to-day management involvement when you outsource work. *Fact:* True, but there is no control over - nor feedback from - day-to-day results either.
Myth 6: An easy way to solve sticky problems is to outsource it to a specialist. *Fact:* That's true only if the problem is not a structural one that your company owns or causes. Otherwise you have just moved it farther from its cause and made it harder to remedy.
Myth 7: The outsourced contractor needs to know all about your business to be most effective. *Fact:* Teach someone your business in detail and there is a real chance the contractor will steal your business from you. Be very careful. There is a fine line between sharing relevant information and giving away too much.
Myth 8: Everyone says it's the thing to do. *Fact:* You should ask who "everyone" is and what their motives are. Most of the people quoted in the media are the ones selling the outsourced services. A lot of buyers have been reversing course and bringing work back in-house (insourcing) because the outsourced services were overpromised and underdelivered.
Myth 9: The cost is lower if you outsource it. *Fact:* This is only true if the contractor is significantly better at the outsourced task than you are. The vendor will have its own costs to cover, and will add a profit margin before its costs becomes your cost.
Myth 10: "They promised they would do things for us that they won't do for the competition." *Fact:* It they'll do it for you, they'll do it to you

There are genuine advantages in using third-party contractors. Companies must however be wary when outsourcing deals with core elements of their business. When companies outsource core competencies and capabilities they may be giving away their business.

Used intelligently, strategic outsourcing is powerful medicine. But like any powerful medicine, if used incorrectly, it can be deadly.

The process automation industry consists of equipment vendors and system integrators. Equipment suppliers compete to establish their products as the generic in the market. Equipment vendors source their products through their own sales personnel and through partnerships with specific approved service providers like system integrators. By ensuring that their products are used by the systems integrators they ensure distribution of their products to a bigger

market. ETD will mainly operate as a systems integrator. A systems integrator may defined as follows:

To some, any collection of intelligent devices that can talk to each other constitutes an integrated system, and the people that install them qualify as system integrators. To others, a truly integrated system must include factory-floor equipment, process controls, automated manufacturing machinery, computers, operators, managers, and the media by which they all communicate. There are control systems integrators, computer system integrators, information system integrators, manufacturing system integrators, and more - all specialising in their own form of "integrated" automation systems.

2. Technological innovation

The current rapid growth of technology especially in micro-processor based systems is a driving force in the industry. Older technology cannot compete with the new smaller in size and less expensive equipment.

It is excepted that the average life of a control system is about 8 years. If hardware suppliers cannot take up this challenge of technological growth, then they will find themselves with no market share.

Information management is one of the major issues receiving attention at the moment. Currently windows NT is having a great effect on the market.

Technology innovation and change will force companies to merge to enable them to supply the customer with a complete service. It is therefore important for service providers to acknowledge this force changing the current process automation industry.

3. Concentration

The process automation industry is not very concentrated as a wide range of markets are shared reasonably equally among an equally wide number of vendors. There is, however, a trend towards globalising in geographical as well as product spread terms.

4. Economy of scale

While there are obvious advantages to large volumes from a price point of view, it is common for the engineering component to be dominant in a process automation project. Hence small companies with good engineering abilities can compete successfully with large companies.

5. Service differentiation

There is quite a high degree of specialization in the industry although there are players that perform functions such as integration, who subcontract these tasks. Some firms create differentiation by targeting a specific market such as the steel industry. There is also a significant loyalty to certain product brands among our customers. They also have a preference for certain service providers based on a good track record and personal relationships.

d) Key success factors for the process automation industry

Table 3.2
Summary of key success factors in the process automation industry

- Technical knowledge
- Process expertise
- Understanding the customers needs
- Industry knowledge
- Installed base
- Price competitiveness
- Geographical location
- Project management skills

Source: Rockwell automation customer survey

e) Competitive analysis

ETD can divide its competitors into two competitive forces. The internal ISCOR competitors and the external competitors.

External competitors can enter the ISCOR market especially if they already provide services within ISCOR. External competitors that can be deemed as major threats in the internal market include among others: ABB, Bailey, Schneider projects , Honeywell, Moore, Siemens, Yokogawa, Zycom, Foxboro, Keops Isis, Hatch Africa etc.

Systems integrators will divide each project into costs associated with sub-contractors and their own in-house costs. Sub-contractor cost will typically include hardware costs, software costs and equipment installers costs. The in-house costs will typically be engineering design costs, manufacturing and integration costs, commissioning costs, project management costs, site establishment costs and travel and accommodation costs. A total cost breakdown is given in table 3.3.

Table 3.3
Cost breakdown of a typical project.

- Hardware costs
- Engineering design costs
- Application software costs
- Manufacturing and integration costs
- Installation costs
- Commissioning costs
- Documentation costs
- Project management costs
- Training costs
- Site establishment expenditure
- Travel and accommodation costs
- Delivery costs

Source: ETD documentation 1998.

Internal competitors include, among others:

- ISCOR Technology (ITEC),
- line development sections,
- Engineering Technology (ET) line sections, and
- the projects / construction department at ISCOR.

ISCOR is aiming to be a low cost producer. To achieve this goal each separate plant at ISCOR must reduce their R/ton costs. The development section is seen as a non-core service and therefore an overhead cost for the production manager. The current perceptions of the production managers is that they do not want to pay for a service which they will only use during specific capital projects or plant breakdown. This attitude is brought about by the pressure put on production managers by top level management to cut costs.

Poor ETD image and uninformed customers, like production managers, are making it an easy option to cut the services of ETD. The current aim of production managers is short-term financial savings and not long-term strategic planning.

ISCOR management and production will consider ETD and all competitors equally when choosing a service provider.

f) What is the attractiveness and prospects of industry

The purpose of table 3.4 is to supply a summarised reference of the data supplied earlier in this document.

Table 3.4
Industry and competitive analysis summary profile

1. **Dominant Economic Characteristics of the Industry Environment**
   Base metal growth rate 3.6% from 1995-2000. R9-billion in capital committed. Automation identified as a strategic element of success in industry. Industry structure is changing due to clear driving forces, experience curve effects a major barrier to entry for external competitors.

2. **Competition Analysis**

   ⇒ Rivalry among competing sellers can be seen as a strong force due to changing competitive environment
   ⇒ Competitive threat of entry can be seen as a moderate force with the learning curve, brand preferences being major barriers to entry
   ⇒ ISCOR internal suppliers can be seen as a strong force. External suppliers are not a strong force.
   ⇒ Customers like ISCOR can be described as powerful
   ⇒ Competitive threat from substitute technologies / services can be seen as a moderate force.

3. **Driving Forces**

   The major driving forces in the industry can be seen as technological change and service differentiation

4. **Competitor analysis**

   Key competitors are merging with smaller companies to provide a complete solution to companies. Moves to differentiate with respect to the steel industry can be negative to this department.

   Whom to watch: Companies that have already performed work at ISCOR, ITEC, internal line sections. Companies that have already performed work at ISCOR do not experience the learning curve barrier to entry as a big obstacle.

5. **Key success factors**

   - Technical knowledge
   - Process expertise
   - Understanding the customers needs
   - Industry knowledge
   - Installed base

- Price competitiveness
- Geographical location
- Project management skills

6. Industry Prospects and Overall Attractiveness

Factors making the industry attractive
Notable barriers to entry, customers spending capital on automation for competitive advantage, the department is well placed to serve local markets.

Factors making the industry unattractive
The power of suppliers and customers, the threat of external entry by powerful service providers, necessity to achieve business excellence.

Profit outlook
Very good profit outlook. Internal at ISCOR projects enough to sustain ETD's business activities. Money committed to base metal industry. Industry needs to automate to be competitive against international competition. Customers are not as advanced as international competition in the effective use of information. This creates opportunities.

Source: ETD document 1998.

3.2.2.3 Opportunities and Threats

This section describes the different opportunities and threats identified in the dissertation. The results are given in tables 3.5 and 3.6.

Table 3.5
Opportunities of ETD in the process automation industry

Number	Description
O1	The ISCOR market must be seen as a profitable opportunity. Money allocated for automation projects in this market equals R85-million per year over 10 years.
O2	Backward integration into the process automation market
O3	The current change environment allows for innovative thinking and planning
O4	The integration of office floor and plant floor technologies will create opportunities in the information sector of the process automation industry.
O5	There will be opportunities in the global process automation market due to the fact that companies, especially in the base metal sector, has identified automation as a critical success factor.

Source: ETD document 1998.

Table 3.6
Threats to ETD in the process automation industry

Number	Description
T1	Companies already competing in the competitive process automation market have already addressed some of the issues of being *business excellent* organisations.
T2	ISCOR is the main customer of ETD. This makes ISCOR an extremely powerful customer and constitutes a threat to ETD.
T3	Internal ISCOR suppliers of services and products can be seen as powerful suppliers due to the fact that they are not obliged to compete with other suppliers for the sale of their services. This can be seen as a threat to ETD.
T4	Rivalry in the process automation market increases the threat of powerful external competitors entering the ISCOR market.
T5	Major competitors in the external process automation industry are strategically positioning themselves to provide a complete solution to a customer. When seen in light of ISCOR's drive towards cost reduction these moves may constitute a threat to ETD.
T6	The speed of technological development can be seen as a threat if ETD are not aware of new technologies. It may enable external competitors to enter the ISCOR market.
T7	Unstable economic conditions may influence the profitability of the industry.

Source: ETD document 1998.

3.2.3 Internal environment analysis

3.2.3.1 Engineering development department

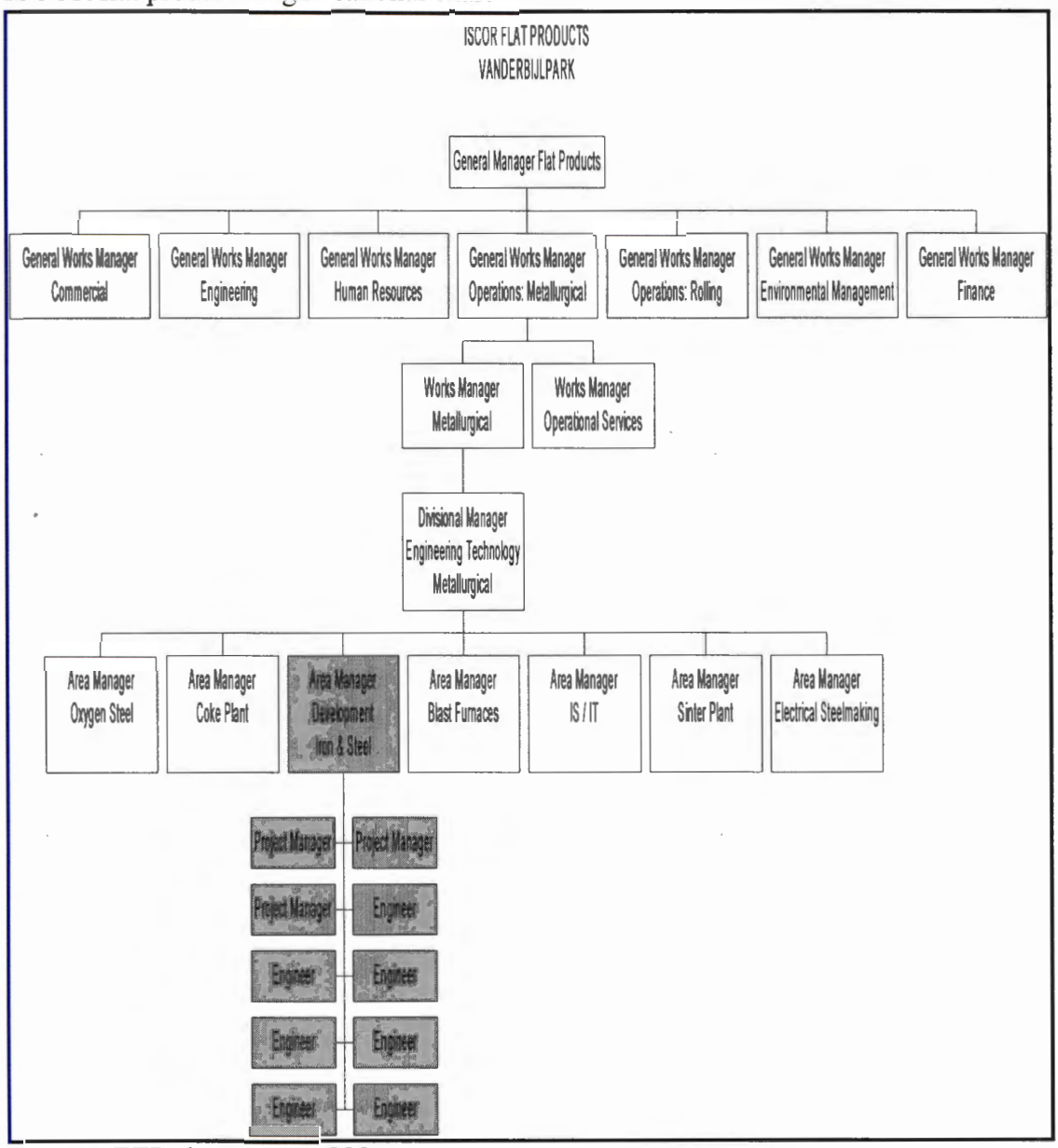
a) Organisational chart

Figure 3.2 shows the ISCOR flat products organisational chart. This chart shows the different levels of management that have an effect on the operations of the department.

b) ETD value chain

ETD's value chain identifies the primary activities that create value for customers and the related support activities; value chains a the tool for thinking strategically about relationships among activities performed inside and outside ETD-which ones are strategically-critical and how core competencies can be developed.

Figure 3.2
ISCOR flat products organisational chart



Source: ETD document. 1998.

ETD's value chain (see figure 3.3) shows the linked set of activities and functions they perform to deliver a service to ISCOR. It is difficult to compare external process automation companies' value chains with that of ETD. The scope of services offered by ETD is broader than that offered by the competing companies.

ETD operates in a strong matrix organisation. Work is obtained either by direct communication between different area managers and the manager of ETD or direct orders form the divisional manager Engineering Technology (ET).

Figure 3.3
ETD value chain

Primary Activities

How are work obtained:	How does ETD add value:	How is the service delivered:	How do ETD support customers after service delivery
• Project nomination lists Capital Projects (A857) • Production requests • Line ET requests • Divisional manager ET • Internally identified needs	• Determine and formulate exact needs of customers • Manage a process to achieve those needs effectively, at the lowest cost and on time. • ETD keeps to date with technology to supply the best solution and provide effective consulting. • Proactively identify problems that our customers are not aware of. • Consider the impact of decisions wider than only within the process automation field.	• ET line resources are utilised, where appropriate, in the delivery of our service. • All stakeholders are consulted to ensure the success of the project. • The product is delivered together with the necessary infrastructure for it to be maintained by the line sections.	• Further development and training • Consultations • Follow up meetings and inspections to ensure that the product met the deliverables as agreed to with the customer.

Support activities

ENGINEERING TECHNOLOGY PLANNING DEPARTMENT
FINANCE DEPARTMENT
HUMAN RESOURCES DEPARTMENT
GENERAL ADMINISTRATION

Source: ETD document 1998.

A project manager or engineer will be assigned to a project if ETD accepts the responsibility of managing the project. The specific plant will then allocate resources from the plant to be part of the project team. This project team will the be responsible to fulfil the customers objectives within a specified budget, functionality and time frame.

The core capabilities of ETD can be described as:

- excellent technical know-how in the different technical areas making up the process automation field,
- in-depth knowledge of specific plants in ISCOR,
- project management capabilities in-line with international standards and
- the ability to provide a complete service to a customer.

One major difference between ETD and external contractors is the ability of ETD to effectively formulate and quantify the customers needs. This is a result of ETD performing value engineering resulting in major cost savings. The customer thus has an extensive cost advantage when making use of ETD.

3.2.3.2 How well is the current strategy working

ETD has no clearly defined strategy. Work was always performed as prescribed by management and top management.

3.2.3.3 Self Assessment

Appendix A shows the results of a self assessment performed on ETD. This assessment as performed within the guidelines laid down in chapter 2 of this document. The strengths and weaknesses of ETD will be identified using the self assessment exercise.

3.2.3.4 Strengths and weaknesses

The strengths and weaknesses has been identified with special reference to the ISCOR market.

Table 3.7
Strengths of ETD

Number	Description
S1	Cost advantage to customers
S2	ETD has an above average mixture of experience and youth to effectively implement a differentiating strategy. ETD can differentiate itself from the rest of the industry by targeting the current steel market in which ETD has invaluable experience.
S3	Although ETD operates in confined company structures they show an unique ability to use international standards and practices especially when defining their processes of operation. This is a strength which is defined by the energy against and resilience of the employees not to be overcome by out-of-date company procedures.
S4	ETD management has a pro-active management style not very common in the ISCOR management establishment. The current management team realises the importance of strategy in the future plans of the department. This is evident in their commitment to this assessment and allocating personnel to developing a strategic plan for ETD.
S5	A positive aspect of work at ETD is their willingness to be measured to certain goals or business targets. This indicates a willingness to operate under pressure such as is present in market conditions.
S6	The technical and managerial skills of ETD have not been fully exploited and can be utilised to provide synergy thus providing a competitive service in the process automation industry.
S7	ETD is well placed to serve the profitable ISCOR market

Source: ETD document 1998.

Table 3.8
Weaknesses of ETD

Number	Description
W1	No strategy for the department
W2	ETD does not have an *influential* sponsor to support them in their future plans. This is important when operating from inside a company like ISCOR.
W3	Overall business excellence can be rated as of a low standard. This is not at all negative considering the constraints in which ETD had to function. It is however important that the *areas of improvement* identified in the self assessment receive attention.
W4	Weak market image
W5	A negative culture under some of ETD's employees may give rise to resistance to change. This resistance to change will undermine any change initiatives if launched from inside ETD.
W6	ISCOR changes are unpredictable and can override the strategic plans of ETD. The inability to make an impact on the "system" is a weakness.
W7	No experience competing in the competitive marketplace. None of the members of ETD has worked outside ISCOR to date.

Source: ETD document 1998.

3.3 Strategic issues and themes

Only cells one and three of the modified SWOT graph will receive attention. This is the case because they constitute the most important issues identified by ETD.

Strategic issues are identified by linking different opportunities, strengths, weaknesses and threats together. Opportunities and strengths are linked together to allow ETD to concentrate on activities and competencies that will enable them to effectively address future opportunities. Weaknesses and threats are linked together to allow ETD to effectively address weaknesses, that combined with certain threats, may cause possible death threat scenario's for ETD.

The different strengths , weaknesses, opportunities and threats have been numbered in tables 3.5 through 3.8. The first strength will be indicated as S1. This notation method will be used for all opportunities, threats and weaknesses.

Table 3.9 contains cell one of the SWOT graph. Here various opportunities were linked to different strengths. These links were identified by ETD in various brainstorming sessions.

Table 3.9
Strengths linked to opportunities

O5	X	X	X				
O4				X		X	
O3				X	X	X	
O2	X	X	X	X		X	X
O1		X	X	X			X
	S1	S2	S3	S4	S5	S6	S7
Totals	2	3	3	4	1	3	2
Priority	5	3	2	1	6	4	7

Source: ETD document 1998

Priorities are attached to the different strengths of ETD. The strengths that have the highest impact on the various opportunities will receive the highest priority. The strengths with the highest priorities will be strategic issues of ETD.

Table 3.10 contains cell three of the SWOT graph. Here various threats were linked to different weaknesses.

Table 3.10
Weaknesses linked to threats

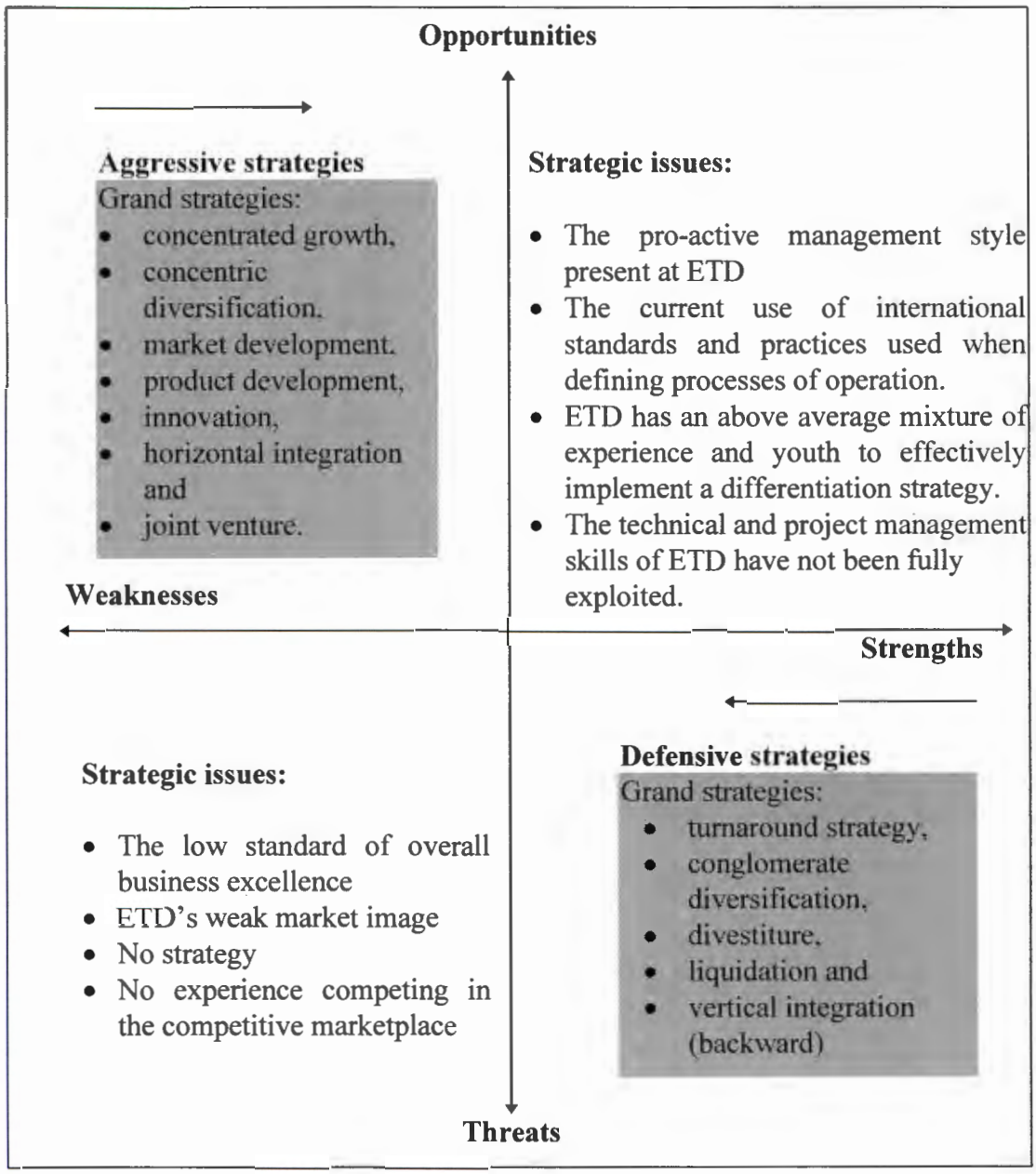
W7	W6	W5	W4	W3	W2	W1	
X			X	X			T1
	X		X	X	X	X	T2
				X	X	X	T3
X		X	X	X	X	X	T4
X			X				T5
		X					T6
X			X	X		X	T7
4	1	2	5	5	3	4	Totals
3	6	5	1	1	4	2	Priority

Source: ETD document 1998.

Priorities are attached to the different weaknesses of ETD. The weaknesses that make ETD the most vulnerable to the various threats identified will receive the highest priority. The weaknesses with the highest priorities will be strategic issues for ETD.

The issues identified and displayed in figure 3.4 will enable ETD to strengthen current core capabilities and address current weaknesses. This will ensure that ETD does everything possible to remain a valued and cost competitive entity within ISCOR.

Figure 3.4
The SWOT graph



Source: ETD document 1998.

Strategic themes have been developed to describe the different cells of the SWOT graph. An aggressive approach to developing strategies is the strategic theme of cell one and defensive strategies is the theme of cell three. Table 3.11 shows the different strategic themes allocated to the main issues identified.

3.4 Appropriate grand strategies for each strategic issue

The next step is to choose the appropriate grand strategies that will be used to address each of the identified issues. The grand strategies are covered in chapter 2 of this dissertation.

Strategies are needed for the different aspects of ETD. This applies to both their weaknesses in addressing threatening market conditions and their strengths that make them a valuable player in the market place.

It is important for ETD to firstly, develop defensive strategies around the strategic issues that can be seen as possible death threat's. Supporting these strategies are the aspects of ETD that can be used to aggressively address the market.

3.4.1 Low standard of overall business excellence

Turnaround strategy has been identified as the primary grand strategy for the current ETD situation. The problems of ETD can be best addressed by a concerted effort to develop and improve on their distinctive competencies. Attention to certain key aspects of the business excellence model will help to improve the current status and effectiveness of ETD. The key aspects of the business excellence model which must receive immediate attention are:

- policy and strategy,
- customer and market focus,
- processes and
- customer and people satisfaction.

3.4.2 Weak market image

The weak market image of ETD will receive attention when ETD improve on key aspects of the business excellence model. Customer and market focus has been identified as a key aspect that must receive attention. Customer and market focus has to do with determining customer and market needs, requirements and expectations, enhancing of relationships and determination of customer satisfaction.

3.4.3 Lack of strategic direction

ETD has identified the lack of any strategic direction as an important strategic issue. This document addresses this strategic issue and will form the basis for the effective implementation of the business excellence model at ETD.

3.4.4 No experience competing in the competitive market place

A second grand strategy that *can* be relevant to ETD is *vertical integration*. The idea would be to form a strategic partnership with an external process automation organisation. This process automation organisation can have expertise in most of the industry sectors of South-Africa. If such a partnership is formed, ETD will operate as the steel arm of such an organisation targeting ISCOR as its main market. This partnership will then address all the above mentioned strategic issues. Working with an experienced external organisation will address ETD's lack of business excellence, drastically improve ETD's weak market image, give strategic direction and provide business and technical experts with impressive competitive experience.

3.4.5 The pro-active management style present at ETD

ETD management can help implement a *market development strategy* by:

- improving the marketing of ETD services at top management level,
- analysing and improving the current scope of services, and
- being responsible for the control and evaluation of the business excellence model with special reference to the key factors already identified.

3.4.6 The current use of international standards and practices when defining processes of operation.

International standards can be useful in developing a *product development strategy.* Performing specific tasks, like project management, with recognised international standards can enable ETD to effectively develop their services, ensuring customer satisfaction.

The use of international standards is part of effective processes as identified in the business excellence model

3.4.7 ETD has an above average mixture of experience and youth to effectively implement a differentiation strategy.

This aspect of ETD can be used in conjunction with it's management to develop and implement *a market development strategy.* Improving and marketing the current services of ETD is an important aspect of future success.

3.4.8 The technical and project management skills of ETD have not been fully exploited

The potential in ETD can be used to implement a *concentrated growth strategy.* ETD identified their ability to assess market needs, their extensive knowledge of the ISCOR environment, knowledge of buyer behaviour and preferences as being some of their strengths. These are all aspects that determine the success of implementing a concentrated growth strategy.

ETD must use the concentrated growth strategy to effectively build on its core competencies while concentrating on the ISCOR market. This is the market they know best and in which they have already proven their worth.

3.5 Strategy formulation

A *turnaround strategy* has been identified as being the main strategy that can help ETD to effectively address their current situation. A second option in vertical integration that can be considered if the turnaround strategy is not the best option. The following strategies were identified to support the main strategy:

- a concentrated growth strategy,
- a market development strategy, and

- a product or service development strategy.

It is important to identify and document the effects that these strategies will have on the current product or service provided by ETD.

3.5.1 Turnaround strategy

ETD must launch a concerted effort to develop and improve on their distinctive competencies. To support this action, ETD must address the various weaknesses that can contribute to possible death threat situations at ISCOR. Attention to certain key aspects of the business excellence model will help to improve the current status and effectiveness of ETD. Certain key aspects of the business excellence model must receive immediate attention. These aspects will be discussed in the following sections:

a) Policy and strategy

The main aim of policy and strategy has to do with how ETD formulates, deploys, reviews and turns policy and strategy into plans and actions. ETD must :

- develop policy and strategy on information which is relevant and comprehensive,
- communicate and implement the developed policies and strategies, and
- regularly review, update and improve on their policies and strategies.

b) Customer and market focus

The main aim of customer and market focus has to do with how the department determines requirements and enhances relationships with customers and markets. This requires certain important action plans that will be discussed below. ETD must:

- develop a process of how customer and market intelligence are determined ,
- develop a reliable process of collecting and using customers and market information, and
- develop an effective customer satisfaction survey to ensure the collection of relevant information.

c) Processes

The main aim is to identify, manage, review and improve the processes of ETD. Important action plans that will receive attention will be discussed below. ETD must:

- identify processes key to their success,
- systematically manage their processes,

- review processes and set targets for improvement,
- facilitate the use of innovation and creativity to improve processes,
- continuously evaluate and change its processes and evaluate its benefits, and
- design and improve on support processes.

d) Customer and people satisfaction

Areas to address when giving attention to people satisfaction include people's perception relating to (e.g. surveys, structures appraisals, focus groups, etc.) motivation and satisfaction.

Areas to address when giving attention to customer satisfaction includes measuring perceptions relating to ETD's products, services and customer relationships.

3.5.2 Concentrated growth strategy

When implementing a concentrated growth strategy the following steps should be taken regarding the product or service provided by ETD.

a) Increasing present customers

The weak image of ETD will receive immediate attention when implementing the key aspect of the business excellence model. With the increased market and customer focus will come an increased focus on marketing the various aspects of ETD's services. History is filled with poor customer relations and non existent marketing and product communication.

The aim is to increase the awareness of the services provided by ETD as to increase the use of these services in ISCOR.

b) Attracting competitors' customers

ETD must ensure that external organisations cannot easily enter the ISCOR market. ETD has already differentiated themselves from the process automation industry by targeting the steel industry. The aim is to increase promotional effort and realise significant prices savings for customers. This will enable ETD to keep the ISCOR customer and defend their market.

To defend the current market it is important to develop and supply services in a professional manner. To achieve this aim ETD has already started to assess themselves according to the business excellence model of South Africa. This model covers all aspects of ensuring employee and customer satisfaction.

c) Attracting nonusers to use ETD's services

ETD identified customers' lack of knowledge about ETD and its products as an area of improvement. To attract more users of ETD's services within ISCOR it is important to market their services, be cost competitive and deliver an overall professional service to the customer.

3.5.3 Market development strategy

When implementing a market development strategy the following steps should be taken regarding the product or service provided by ETD.

a) Opening new markets

ETD will consider entering other markets outside of ISCOR. This option can however only be considered once the current ISCOR market has been addressed.

b) Attracting other market segments

ETD can analyse its current scope of services to determine if the total service provided is what the customer expects. It may be necessary to modify the scope of products offered to the customer. Media such as the ISCOR intranet can be used to market and promote ETD's scope of services. This is in addition to the marketing of ETD's services on managerial and shop floor level. Each of ETD's employees will have the responsibility to actively market their scope of products.

3.5.4 Product or service development strategy

When implementing a product or service development strategy the following steps should be taken regarding the product or service provided by ETD.

a) Developing new product or service features

The current service provided by ETD will be influenced by the fast changing technological environment. The service must be adapted, changed or modified to suit the changing needs of the customer. Information technology should receive attention as it is the fastest growing field in process automation.

An effective combination of the various expertise in ETD should enable ETD to effectively address customer requirements.

3.6 Mission and vision

3.6.1 Vision

The following vision and mission statements were formulated after communication of the above mentioned strategies and subsequent departmental meetings with all relevant stakeholders. The vision statement of ETD is:

> *"To positively affect ISCOR's bottom line performance by being leaders in process automation"*

3.6.2 Mission

The mission statement of ETD is:

> *" We at ETD will strive to be innovative suppliers of process automation solutions, that will exceed all customer expectations and in this way, build strong and lasting relationships with all stakeholders."*

3.7 Conclusion

Chapter 3 contains the results of the practical application of the strategy formulation phase, for ETD, through the use of the strategic management model.

ETD identified different strategic issues to help develop their main strategies. The first set of issues had to do with ETD's weaknesses and threats. The weaknesses that make ETD the most vulnerable to the various threats will receive a high priority. The weaknesses with the highest priorities will be strategic issues for ETD. The first set of strategic issues that were identified are:

- The low standard of overall business excellence
- ETD's weak market image
- No strategy
- No experience competing in the competitive marketplace

ETD found it important to firstly address these strategic issues that originated from their weaknesses and threats. A *turn-around strategy* has been identified as the primary grand strategy in addressing the above mentioned issues. Concerted effort must be given to certain key aspects of the business excellence model. This will help improve the current status and effectiveness of ETD. The key aspects of the business excellence model which will receive immediate attention are:

- policy and strategy,
- customer and market focus,
- processes and

- customer and people satisfaction.

The second set of strategic issues had to do with ETD's strengths and opportunities. The strengths that have the highest impact on the various opportunities will receive a high priority. The strengths with the highest priorities will be strategic issues of ETD. The second set of strategic issues are:

- The pro-active management style present at ETD
- The current application of international standards and practices used when defining processes of operation.
- ETD has an above average mixture of experience and youth to effectively implement a differentiation strategy.
- The technical and project management skills of ETD have not been fully exploited.

In supporting the main turn-around strategy, ETD identified various other grand strategies to strengthen their current core competencies and position in the market.

The following strategies were identified to support the main strategy:

- a concentrated growth strategy,
- a market development strategy, and
- a product or service development strategy.

ETD developed their mission and vision to reflect their intent in the market.

One of the key elements of ISCOR's Vanderbijlpark business strategy, is to be an overall low cost producer. A management consultant was commissioned to evaluate all the business aspects of ISCOR. Their recommendations directly influenced the role of service departments in the future ISCOR. It is however, the responsibility of these sections to show their strategic worth and develop a plan of action to support ISCOR in reaching its strategic goals.

This strategic plan addresses these and other external issues. The main strategic process identified a need for service departments, like ETD, to become more business orientated. The implementation of this strategic plan will have a positive effect on both the ISCOR overall business strategy and the industry in which it operates.

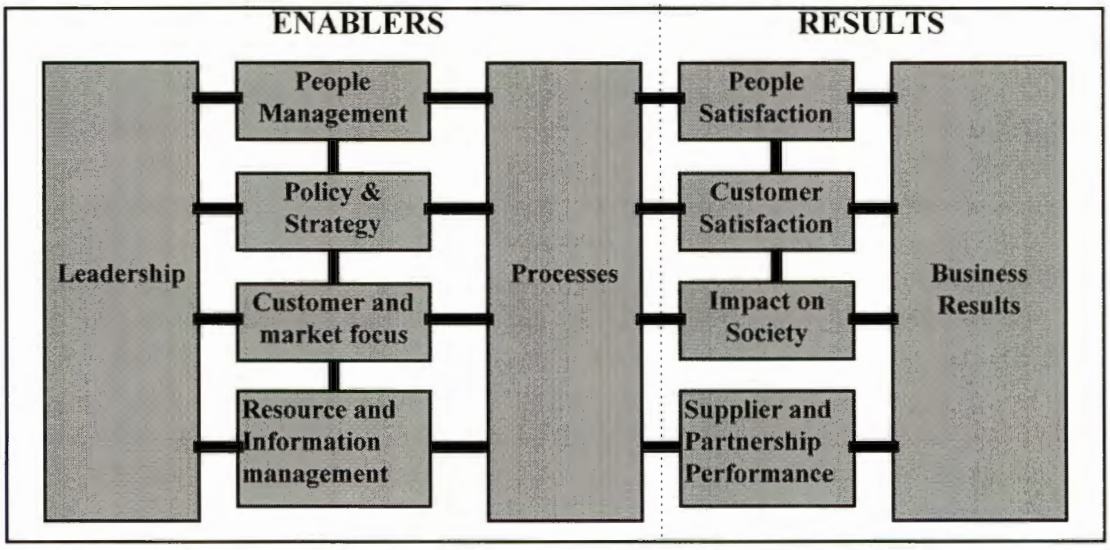
APPENDIX A
BUSINESS EXCELLENCE MODEL OF SOUTH-AFRICA

A.1 Introduction

The business excellence model (see figure A.1) is a framework for assessing the "excellence" of an organisation. The model is based on the concept that an organisation will achieve better results by involving all the people in the organisation in continuous improvement of their processes.

Self-assessment using a model or framework is not a new idea. Similar models have been in use in America, Europe, Japan and in many leading companies on a global basis.

Figure A.1
The South-African business excellence model (SABEM)



Source: Business Excellence South-Africa: 6.

ENABLERS - What the employees do to run their department. How they operate.

RESULTS - What the department achieves as seen by those who have an interest in the department; customers, employees of the department, the community at large and those who champion the functions of the department. How the department measures and targets achievement.

OVERALL - The eleven criteria of the SABEM model are linked by the principle that:

> "**Customer Satisfaction, People** (employee) **Satisfaction, Impact on Society** and **Supplier and Partnership Performance** are achieved through **Leadership** driving **Policy and Strategy, People Management, Customer and Market Focus**, **Resource and Information Management** and **Processes** leading ultimately to excellence in **Business Results**"

The South African Business Excellence Model was developed by the South African Business Foundation (SABEF) in 1997, and builds on experience of the Malcolm Baldrige National Quality Award (MBNQA) (USA) and the European Foundation for Quality Management (EFQM) (EU). The SABEM model has been adopted throughout the Southern African Development Community (SADEC) countries and is duly recognised by both MBNQA and EFQM.

A.2 Assessment

The assessment of the engineering technology department was carried out by 3 assessors. Information was gathered in various interviews held with leaders, employees and other stakeholders of the department to determine the strengths and areas of improvement of the department. These strengths and areas of improvement were determined by assessing the departments efforts to comply with the various functions of the business excellence model.

1. Leadership

How the behaviour and actions of the executive team and all other leaders inspire, support and promote a culture of Business Excellence.

1a) **Evidence** is needed of **how leaders visibly demonstrate their commitment to a culture of Business Excellence.**

Strengths

- Regular cross functional departmental meetings are held
- Presentations by different members of the different functional areas in the department
- Evidence that the department policy and strategy are being developed
- Internal ISCOR mentoring scheme for managers is (BOS) in place. BOS is a name for an ISCOR internal management evaluation program to assist managers in developing their managerial abilities.
- Management includes personal development plans in the idea generation phase of projects
- Evidence exists that leaders try to improve their effectiveness (BOS)

Areas of improvement

- No evidence of the existsence of a policy or strategy
- No evidence that leaders act as role models for the organisation's values and expectations
- No evidence of any quality training by leaders
- Little evidence of leaders making themselves accessible to listen to employees
- No evidence of leaders being actively involved in quality activities
- No evidence of formal methods to seek feedback on their own leadership abilities

1b) **Evidence** is needed **of how leaders support improvement and involvement by providing appropriate resources and assistance.**

Strengths

- Evidence exists that leadership intend to connect priorities to strategic decisions
- Evidence exists that staff are released to undertake self assessment
- Evidence exists that leaders are aware that appraisal and promotion systems exists and can be useful

Areas of improvement

- No evidence exists that leaders define departmental priorities
- No evidence exists that leaders 'fund' continuous learning, facilitation and implementation activities
- Little evidence exists that leaders use appraisal and promotion systems

1c) **Evidence** is needed of **how leaders are involved with customers and suppliers.**

Strengths

- Evidence exists that leaders realise that involvement of customers and suppliers are important for success

Areas of improvement

- Little evidence of how leaders meet, understand and respond to the needs of customers and suppliers
- No evidence that leaders establish and participate in partnerships
- No evidence that leaders promote and support TQM outside the department and participate in joint venture activities

1d) **Evidence** is needed of **how leaders recognise and appreciate people's efforts and achievements.**

Strengths

- Some evidence exists that leaders recognise and appreciate people's efforts and achievements

Areas of improvement

- Little evidence exists that leaders are involved in recognising individuals and teams at all levels within and outside the department

1e) **Evidence** is needed of **how leaders (and the employees) address public responsibility and practice good citizenship.**

Strengths

- Evidence exists that leaders realise the importance of addressing public responsibilities and practice good citizenship

- Evidence exists that leaders actively participate in professional bodies (SAIEE and PMBOK)

Areas of improvement

- Little evidence exists that leaders address public responsibilities and practice good citizenship

2. **Policy and strategy**
   How the department formulates, deploys, reviews and turns policy and strategy into plans and actions

2a) **Evidence** is needed of **how policy and strategy are based on information which is relevant and comprehensive.**

Strengths

- Evidence exists that leaders except the fact that policy and strategy should be based on information that is relevant and comprehensive
- Evidence exists that leaders are aware that benchmarking activities should form part of strategy and policy
- Evidence exists that leaders considers measuring themselves against the best in their industry
- Evidence exists that safety is addressed during all projects

Areas of improvement

- No evidence exists that leaders use information relating to customer and suppliers, the department's people and external departmental shareholders
- Little evidence exists that the department uses information relating internal performance indicators
- No evidence exists that benchmarking is used as part of strategy and policy formulation
- No evidence exists that the department has a system in place to measure themselves to the best in the industry
- Little evidence exists that the department use information relating to: social, environmental, legal, economic, demographic indicators and new technologies

2b) **Evidence** is needed of **how policy and strategy are developed.**

Strengths

- Evidence exists that policy and strategy are currently being developed and all department employees are involved
- Evidence exists that the department realises the importance to balance short term and long term pressures and requirements
- Some evidence exists that the department recognise its stakeholders, identifies competitive advantage, reflects principles of TQM in its policy and strategy

Areas of improvement

- No evidence exists that the department develops its mission and vision through:
  - ◊ a clear statement of desired position of the company
  - ◊ quality policy statements committing the department to Quality
  - ◊ customer satisfaction and employee motivation as a high priority
- Little evidence exists of how the department develops policy and strategy
- Little evidence exists to indicate that the department balances long and short term pressures and requirements
- No evidence exists of formal procedures addressing the need of stakeholders, competitive advantages and implementation of quality management in policy and strategy

2c) **Evidence** is needed of **how policy and strategy are communicated and implemented.**

Areas of improvement

- No evidence exists of how policy and strategy are being communicated

2d) **Evidence** is needed of **how policy, strategy are regularly reviewed, updated and improved**

Areas of improvement

- No evidence exists that policy and strategy are regularly reviewed

3. **Customer and market focus**
How the department determines requirements and enhances relationships with customers and markets.

3a) **Evidence** is needed of **how customer and market intelligence is determined.**

Strengths

- Some evidence exists that the department selects customer groups and market segments
- Some evidence exists that the department recognises the need to determine and/or projects key product and service features and their relative importance to customers

Areas of improvement

Little evidence exists that there are formal procedures to address:

- the determination of customer groups
- the determination of and/or the projection of key product and service features and their relative importance to the customer
- the evaluation and improvement of their approach to listening and learning from customers and markets
- the changing needs of customers and markets

3b) **Evidence** is needed of **how customers and market information is collected and used**

Strengths

- Some evidence exists that the department receives information from customers and then react of this information

Areas of improvement

No formal evidence exists of how the department:

- evaluates, processes and acts on information received
- reviews the effectiveness of the system of obtaining information

3c) **Evidence** is needed of **how the department maintains accessibility and addresses complaints.**

Strengths

- Some evidence exists that the department realises the importance of customer contact requirements

Areas of improvement

Little evidence exists of how the department:

- determines customer contact requirements and deploys the requirements to all employees
- evaluates and improves customer contact performance
- determines and reviews customer contact performance
- resolves complaints effectively and promptly
- aggregates and analyses complaints received by all in the department
- reviews and updates the departments complaint management process

3d) **Evidence** is needed of **how customer satisfaction is determined.**

Areas of improvement

Little evidence exists of how the department:

- follows up with customers on products, services, and recent projects to receive prompt and actionable feedback
- determines and measures customer satisfaction
- obtains objective and reliable information on customer satisfaction
- obtains objective and reliable information relating to its customers

4. People management

How the department releases the full potential of its people.

4a) **Evidence** is needed of **how people resources are planned and improved.**

Areas of improvement

Little evidence exists of how the department's people resources are planned and improved by:

- aligning the people resources plan with policy, strategy and values
- the development of a people satisfaction survey
- the alignment of remuneration, redeployment, redundancy and other terms of employment with policy and strategy
- the use of innovative work organisations strategies and methods to improve the way of working

4b) **Evidence** is needed of **how people capabilities are sustained and developed.**

Areas of improvement

Little evidence exists of how the department sustain and develop people capabilities through:

- identifying, classifying and matching people's competencies with the department needs
- orientating new employees
- reviewing the effectiveness of education and training
- promoting continuous learning
- managing recruitment and career development

4c) **Evidence** is needed of **how people agree to targets and continuously review performance.**

Areas of improvement

Little evidence exists of how the department agrees on targets and continuously reviews performance. This can be done by:

- aligning individual and team objectives with the department's targets
- reviewing and updating individual and team objectives
- appraisal and helping people improve their performance

4d) **Evidence** is needed of **how people are involved, empowered and recognised**

Areas of improvement

Little evidence exists of how the department get people involved, empowered and recognised. This can be done by:

- encouraging and supporting individual and team participation in improvement
- empowering people to take action and evaluate effectiveness
- designing and applying a recognition system to sustain involvement and empowerment

- encouraging awareness that employees are stakeholders

4e) **Evidence** is needed of **how people and the department have an effective dialogue.**

Areas of improvement

Little evidence exists of how the department has and encouraged effective dialogue in the department. This can be done by:

- identifying communication needs
- sharing information and having dialogue with its people
- evaluating and improving communication effectiveness

NOTE: Management may experience this section as a harsh judgement by their people. In reality any activities by management to try the above mentioned areas of improvement are overshadowed by very negative feelings in the department. These feelings are part of a belief that the current changes are just another failed attempt to change. These feelings overshadow any constructive assessment and must receive immediate attention.

5. Resource and Information Management

How the department manages and uses resources and information effectively and efficiently.

5a) **Evidence** is needed of **how financial resources are managed**

Strengths

- Evidence exists that the department realises that there is a big risk factor involved in project management and it needs to be managed

Areas of improvement

- Little evidence exists of how leaders use financial management to support policy and strategy
- Little evidence exists of how reviews are used to improve financial parameters e.g. results analysed monthly
- Little evidence exists of how managers manage financial risks

5b) **Evidence** is needed of **how information resources are managed**

Strengths

- Evidence exists that the department realises that relevant access to information must be made available to relevant users e.g. intranet site
- Evidence exists that the department aims to ensure and improve data integrity and security

Areas of improvement

- Little evidence exists of how the department gives relevant people access to information

- No evidence exists that the department structures and manages information to support policy and strategy
- Little evidence exists of a formal system ensuring data integrity

5c) **Evidence** is needed of **how comparative information and data are selected and used.**

Strengths

- Evidence exists that comparative information and data are being used e.g. industry sources and AMR (Marketing research)

Areas of improvement

- Little evidence exists of how the department determines needs and prioritises from comparative information
- Little evidence exists of how the department seeks sources of appropriate comparative information and data from within and outside the department, industry and markets
- No evidence exists of how the department uses benchmarks, comparative information and data to stretch targets and encourage performance breakthroughs
- Little evidence exists of how the department keeps in touch with changing needs of their type of business, deploys and integrates benchmarks and comparative data

5d) **Evidence** is needed of **how partnering and supplier relationships and materials are managed.**

Strengths

- Evidence exists that leaders realise the importance of effective management of supplier relationships and materials

Areas of improvement

- No evidence exists of how the department develops supplier relationships, maximises the added value of suppliers, improve the supplier chain, optimise material inventories, reduces consumption of utilities and reduces and recycles waste

5e) **Evidence is needed of how buildings, equipment and other assets are managed.**

Strengths

- Evidence exists that the department considers the impact on the community and employee's health and safety
- Some evidence exists that the department manages the security of assets

Areas of improvement

- Little evidence exists of how buildings, equipment and other assets are managed by:
  - ◊ optimisation of assets in line with policy and strategy
  - ◊ managing the maintenance and utilisation of assets e.g. review of asset register
  - ◊ considering the impact of assets on the community and employees

5f) **Evidence** is needed of **how technology and intellectual property are managed.**

Strengths

- Ample evidence exists of the exploitation of existing technology within the department
- Evidence exists on employees visiting organisations to review new methods and products
- Evidence exists that the training needs of employees are accessed prior to implementation of projects
- Evidence exists that the department harnesses technology in support of improvement of processes, information systems and other systems

Areas of improvement

- Little evidence exists that the department identifies and evaluates alternative and emerging technologies in light of policy and strategy and their impact on the department and society
- No evidence exists of a formal procedure for accessing training needs of employees

6. Processes

How the department identifies, manages, reviews and improves its processes

6a) **Evidence** is needed of **how processes key to the success of the department are identified.**

Strengths

- Ample evidence exists of the acknowledgement of the strengths and benefits of the SABEM model
- Evidence exists of the evaluation of project results

Areas of improvement

- No evidence exists of how the department defines and evaluates key processes

6b) **Evidence** is needed of **how processes are systematically managed**

Strengths

- Evidence exists that the department are aware that processes should be systematically managed e.g. process owner per project

- Evidence exists that project management standards are being used e.g. ISO 10006, 9001 and drawing standards

Areas of improvement

- No evidence exists of the following:
  - ◊ how the department establishes process ownership and process management
  - ◊ how the department establishes and monitors standards of operation
  - ◊ how the department uses performance measurements in process management
  - ◊ how the department applies environmental and other standards, in process management
  - ◊ how the department resolves interface issues inside and outside the department

6c) **Evidence** is needed of **how processes are reviewed and targets are set for improvement.**

Strengths

- Evidence exists that the department is aware that departmental processes should be reviewed

Areas of improvement

- Little evidence exists of:
  - ◊ how the department identifies and prioritises methods of improvement, both incremental and breakthrough
  - ◊ how the department uses information from employees, customers, suppliers, other stakeholders, competitors and data from benchmarking in setting standards of operation.
  - ◊ how the department relates current performance measurements and targets for improvement to past achievement
  - ◊ how the department identifies and agrees on challenging targets to support policy and strategy

6d) **Evidence** is needed of **how processes are improved using innovation and creativity.**

Strengths

- Evidence exists that improvement teams are used to bring to bear improvements
- Evidence exists of supplier visits to stimulate innovation
- Evidence exists that seminars are attended to obtain knowledge of best practices

Areas of improvement

Little evidence exists of how:

- the department brings to bear the creative talents of employees
- the department discovers and utilises new designs, technologies and operating philosophies

- the department changes structures to encourage innovation and creativity
- the department uses feedback from customers and suppliers to stimulate innovation and creativity

6e) **Evidence** is needed of **how processes are changed and the benefits evaluated.**

Strengths

- Evidence exists that the department acknowledges the value of the business excellence model

Areas of improvement

Little evidence exists of how the department:

◊ agrees on appropriate methods of implementing change
◊ pilots and controls the implementation of new or changed processes
◊ communicates process changes
◊ trains people prior to implementation
◊ reviews process changes to ensure predicted results are achieved

6f) **Evidence** is needed of **how support processes are designed and improved.**

Areas of improvement

Little evidence exists of how the department:

◊ designed, managed and improved support processes
◊ determines key requirements which incorporate input from internal and external customers
◊ designs support processes to meet overall performance requirements
◊ describes key support processes and their principle requirements
◊ manages processes in order to maintain process performance and ensure results will meet operational and customer requirements
◊ evaluates and improves processes to achieve better performance

7. Impact on Society

What the department is achieving in satisfying the needs and the expectations of the community at large.

7a) **Evidence** is needed of **the society's perceptions of the department**

Areas of improvement

No evidence exists of how the department:

- the scope of society
- determines and evaluates important aspects concerning society

8. Customer Satisfaction

What the department is achieving in relation to the satisfaction of its external customers.

8a) Evidence is needed of **the customer's perceptions of the departments products, services and customer relationships.**

Areas of improvement

Little evidence exists of how the department:

- regularly carries out surveys on customer satisfaction
- indicates customers relative importance to them
- performs and publishes detailed research on customer requirements
- uses a systematic approach in analysing customer research results

9. People Satisfaction

What the department is achieving in relation to the satisfaction of its people.

9a) Evidence is needed of the **people's perceptions of the department.**

Areas of improvement

There is a very negative sentiment inside the department due to the change activities currently under way. These activities are by no means motivational and influence the overall mood of the department.

- No evidence exists of how the department measures and manages perceptions in the department. There is a very clear difference in culture between the two areas of iron and steel production. It these differences are not managed correctly it can lead to resistance to change when the final implementation of the strategy is under way.

10. Supplier and Partnership Performance

What the department is achieving in relation to the management of supplier and partnering processes.

10a) Evidence is needed of the **departments perception of its suppliers' and partners' performance.**

Strengths

- Evidence exists that the department takes note of suppliers' performance in past projects
- Evidence exists that suppliers are being evaluated (QA and QC)

Areas of improvement

- Too little evidence exists of response to customers' complaints
- Little evidence exists of how the department formally develops and evaluates indicators of supplier and partnership performance

10b) Evidence is needed of **additional measures relating to the performance of the departments suppliers and partners.**

Areas of improvement

- Little evidence exists that any additional measures have been developed to improve supplier and partnership performance e.g. cost reduction of performance audit

11. Business Results

What the department is achieving in relation to its planned business objectives and in satisfying the needs and expectations of everyone with financial interest or stake in the departments.

11a) Evidence is needed of **financial and additional measurements of the department's performance.**

Areas of improvement

Little evidence exists of how the department uses:

- financial or other additional measurements to measure performance by determining the efficiency and effectiveness of the departments key processes and overall performance.

A.3 Summary

To assess a department consisting of 12 engineers and project managers, using a model designed for bigger corporations, was always going to be a difficult task. The three assessors had to sort the relevant information and compile the summary of answers as listed above.

The assessment delivered a lot of strengths and areas of improvement that are important aspects to consider if this department were to effectively develop strategic options. In completing the assessment the assessors noted different aspects that were, in their opinion, some of the major drivers for strengths and areas of improvement of the department.

Strengths

- The current management team realises the importance of strategy in the future plans of the department. This is evident in their commitment to this assessment and allocating personnel to developing a strategic plan for the department. This

indicates a pro-active management style not very common in the ISCOR management establishment.

- This department is one of the most active in customer and market focus if measured on ISCOR standards. This can be a result of a past of unstructured working methods that made the working environment both negative and without challenge. This is unacceptable to hard working and gifted engineers and project mangers.
- A positive and refreshing aspect of work in this department must be their drive to develop effective processes to support their drive for excellence. This is a very difficult task taking into account the constraints in which this department must function.
- A positive aspect of work in this department is their willingness to be measured to certain goals or business targets. This indicates a willingness to operate under pressure such as is present in market conditions.
- This department consists of dynamic individuals that are willing and able to operate as an effective team under competitive market pressures.

Areas of improvement

- It is of concern that the department does not of yet have a influential sponsor to support them in their future plans. This is important when operating from inside a company like ISCOR. This issue should receive priority in future.
- One aspect that must receive attention is the development and implementation of a strategy for the department. This will give the department insight into the success factors of their type of business and help them plan for the changing future. Having a strategy will help direct the attention and energy of the employees which will lead to better results.
- The department has the ability to perform on higher levels as is the case at the moment. Working as a typical ISCOR department is undermining the innovative energies of the management and workers alike. This constraint is a major determinant in the ability of this department to successfully address the future threats and opportunities facing this department.
- A worrying aspect of the working environment must be the negative atmosphere that is assumed as a way of life at ISCOR. This is a direct result of the current human resources and change strategies of the parent company, ISCOR. It does not help if management wants to use a negative and superstitious workforce to implement drastic changes in working environment. To some of the employees this strategic exercise is just another meaningless ISCOR "flavour of the day" exercise. It is unbelievable that any company can allow their employees to be so negative (for a lack of words). It is unrealistic to think that even the positive won't be effected.
- Overall business excellence can be rated as of a low standard. This is not at all negative considering the background of the department. It is however important that these areas of improvement mentioned above receive attention.

APPENDIX B
LARGE CAPITAL PROJECTS BY INDUSTRY SECTOR

To get an overview of the economic characteristics of the process automation industry , it is wise to look at the different industry sectors. Development in these sectors provides money for the automation industry. This appendix shows the different industries and the large projects planned by the industry sectors till the year 2002.

Table B.1
Capital projects by industry sector

Industry Sector	Projects	To Year	Rand millions	Rand billions
Agriculture	Forests, distillery etc.	2000	R644	
Mining	Collery, platinum expansions, mines, zinc smelter, iron ore, titanium	2000		R15.2
Base metals	Steel	2002		R9 committed R17 feasibility studies
Petrochemical, chemical, rubber and plastic	Plants petrochemical, oil and gas exploration	1999		R3.5
Paper and pulp	Paper mills	2004		R1.5
Civil and construction - water and roads	Water supply and Sanitation	2000 2000	3000 7300	
Glass and non metallic	Mill, factory Concrete	2000	1030	
Food, beverage and tobacco	Food processing plant	2000		R4.2
Electricity, water, waste and gas	Power Water, Waste Dams, Irrigation Pipelines	2000	R630 R4413 R150	
Automotive and transport equipment	Plant/production Plant expansion	1998 2000	 R1489	R2.067
Metal products and machinery	Steel Mill	2000	R850	
Textile R&D **Electric and electronic R&D**	Process development	2000	R153 R134	
Total			**R19793**	**R52-47**

Source: AMI. 1998

APPENDIX C
ISCOR CAPITAL EXPENDITURE

C1. Introduction

Tables C.1 to C.3 shows the different scenarios for the planned capital expenditure for ISCOR Vanderbijlpark over the next ten years. The planned capital relevant to the process automation market can be quantified as R56-million a year on average over the next ten (10) years.

C2. Analytical process

The process used to analyse the capital expenditure budget consisted of the following steps:

- Identify the projects that have a process automation content.
- Determine the scope of the project that is relevant to process automation. From experience this is between eight (8) and twenty (20) percent.
- Define three scenarios, i.e. a pessimistic calculation at eight (8) percent process automation content (Table C.1), a most likely calculation at twelve (12) percent process automation content (Table C.2) and a optimistic calculation at twenty (20) percent process automation content (Table C.3).
- Implement the scenarios to obtain the expected cash flow over the next ten (10) years.

Table C.1

Capital Expenditure cash flow schedule

Pessimistic scenario

Financial year Process Plant	1998 / 1999	1999 / 2000	2000 / 2001	2001 / 2002	2002 / 2003	2003 / 2004	2004 / 2005	2005 / 2006	2006 / 2007	2007 / 2008	Sub total per plant
Coke Plant	644	10,347	13,641	450	542	194	0	14,196	49,131	106,950	**196,095**
Blast furnace	4,397	9,906	3,283	3,414	36,109	17,117	0	2,390	10,714	22,596	**109,928**
Direct reduction	4,469	0	2,117	2,155	4,162	0	0	0	0	0	**12,904**
Material handling	0	6531.72	5503.14	9933	15423.5	6013	10321	0	0	0	**53,725**
Oxygen steelmaking	5,657	31,921	17,957	19,191	125	1,191	1,403	1,494	2,652	3,369	**84,961**
Continuous caster	5,257	0	5,260	11,445	8,244	10,619	0	0	10,643	0	**51,468**
Electrical steelmaking	183	11,864	7,192	12,913	13,509	6,555	3,386	4,565	0	0	**60,166**
Sub total per fin. year	**20,608**	**70,570**	**54,954**	**59,501**	**78,114**	**41,688**	**15,110**	**22,645**	**73,141**	**132,915**	**569,246**

Source : ISCOR Flat Steel CAPEX budget.

* All values are given in millions (,000)

NB : All information on this page is subject to the secrecy agreement.

Table C.2

Most likely scenario

Capital Expenditure cash flow schedule

Confidential

Financial year Process Plant	1998 / 1999	1999 / 2000	2000 / 2001	2001 / 2002	2002 / 2003	2003 / 2004	2004 / 2005	2005 / 2006	2006 / 2007	2007 / 2008	Sub total per plant
Coke Plant	1,198	20,572	27,244	750	903	323	0	23,660	81,886	178,251	**334,785**
Blast furnace	5,689	9,906	4,897	6,828	72,217	34,234	0	4,781	21,428	45,192	**205,173**
Direct reduction	4,562	0	4,235	2,762	5,837	0	0	0	0	0	**17,395**
Material handling	0	13063.44	11006.28	9933	15423.5	6013	10321	0	0	0	**65,760**
Oxygen steelmaking	6,852	34,366	19,469	22,813	249	1,676	1,871	1,992	3,536	4,855	**97,678**
Continuous caster	5,466	0	5,523	11,445	13,740	17,698	0	0	10,643	0	**64,515**
Electrical steelmaking	30	11,864	7,668	12,913	14,240	6,555	3,761	4,565	0	0	**61,597**
Sub total per fin. year	**23,797**	**89,772**	**80,041**	**67,443**	**122,610**	**66,498**	**15,953**	**34,998**	**117,493**	**228,298**	**846,903**

Source : ISCOR Flat Steel CAPEX budget.

* All values are given in millions (,000)

NB : All information on this page is subject to the secrecy agreement.

Table C.3

Capital Expenditure cash flow schedule

Optimistic scenario

Financial year Process Plant	1998 / 1999	1999 / 2000	2000 / 2001	2001 / 2002	2002 / 2003	2003 / 2004	2004 / 2005	2005 / 2006	2006 / 2007	2007 / 2008	Sub total per plant
Coke Plant	1,843	30,918	40,885	1,199	1,444	516	0	28,392	98,263	213,901	**417,361**
Blast furnace	6,980	9,906	6,510	10,242	108,326	51,351	0	7,171	32,142	67,788	**300,418**
Direct reduction	4,654	0	6,352	3,369	7,513	0	0	0	0	0	**21,887**
Material handling	0	19595.16	16509.42	9933	15423.5	6013	10321	0	0	0	**77,795**
Oxygen steelmaking	7,931	36,704	20,981	26,434	374	2,161	2,339	2,490	4,420	6,341	**110,173**
Continuous caster	5,675	0	5,759	11,445	16,488	21,237	0	0	10,643	0	**71,248**
Electrical steelmaking	365	11,864	8,144	12,913	14,972	6,555	4,325	4,565	0	0	**63,702**
Sub total per fin. year	**27,448**	**108,988**	**105,140**	**75,535**	**164,540**	**87,833**	**16,984**	**42,618**	**145,468**	**288,030**	**1,062,584**

Source : ISCOR Flat Steel CAPEX budget.

* All values are given in millions (,000)

NB : All information on this page is subject to the secrecy agreement.

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