



Interdependency between strategic management and the formulation of an information and communication technology strategy

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1 Introduction

Fundamental change in today's business environment has made information and communication technology (ICT) core ingredients that help to keep an enterprise on target to meet its ultimate vision. According to Pearce and Robinson (2000:13), an organization's strategy must be based on finding an appropriate 'fit' between the organization's mission, changes in the internal and external environment and the quality and quantity of the organization's profile (input factors, primary resources, value chain activities, core capabilities, core competencies, etc.). They further emphasize that strategic analysis and choice centre around the identification of effective strategies for building a sustainable, competitive advantage that is based on the core competencies and capabilities of the firm. Competitive thinking is therefore essential to assess the competitive role of ICT. Strategy should dictate how information and communication technology should be used. At the same time ICT, as a core capability, should make new strategies and new ways of competing

possible.

The aim of this article is to illustrate the interdependency between strategic management and the formulation of an ICT strategy.

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2 Methodology

To supply strategic thinkers with a 'bird's eye view' of the interdependency between strategic management and strategic ICT management, a qualitative research approach was followed in this research. Relevant literature was studied and analysed to identify the relationship between ICT management and planning, and business strategy formulation. Corporate strategy success factors were linked to information strategy success factors to provide a new perspective to the formulation of a business strategy.

The line of reasoning followed throughout this research was that, although no single approach or model could cover all the essential aspects involved, a holistic model can be devised to cover most of the major principles involved in the strategy formulation process. However, the proposed model is only a tool in the quest to illustrate the interdependency between strategic business management and strategic ICT management.

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3 ICT as a strategic corporate resource

Three economic goals guide the strategic direction of almost every business organization, namely *survival* through *growth* and *profitability* (Porter 1980:4). To be able to survive, grow and be profitable, any profit-seeking enterprise must seek a competitive advantage. This should be done at the same time that an efficient and effective 'fit' between the company's mission, profile and external environment is found. The creation of a competitive advantage through the use of information and communication technology therefore involves all of the many challenges associated with strategy formulation.

Businesses strive to achieve a competitive advantage by competing in one of two ways, namely by being a low-cost producer of goods and services or by differentiation of a product or service (Porter 1980).

In addition to the two generic strategies (low cost and differentiation), there are three other strategies that can support them. These are innovation, growth and alliance. Companies can choose to pursue none of these, all of them or combinations of them (Callon 1996:46).

ICT not only influences the generic strategies, but also the supportive strategies. Since the 1960s, ICT has played a significant role in enabling firms to compete on *low cost*. Mainframe computers were primarily used to optimize business processes. During the 1980s, ICT started to support management decision making and played an important role in enabling product and service differentiation. Software applications, for example, provided marketing departments with specific information on customers, helping them to serve these customers better.

At the turn of the century (primarily owing to the widespread use of databases, data warehousing and decision support systems), organizations started to compete on both low cost and product differentiation simultaneously. By impacting on competitive industry forces [as identified by Porter in his work *Competitive strategy* (1980)], organizations started to

target small niche markets for their products or services. Although Porter's initial work did not include ICT as a component of the framework, Applegate, McFarlen and McKenney (1999) listed a number of examples of how ICT can be used to change the power balance. In essence, shifting the focus from an entire industry to a portion of that industry can cause competitive forces to differ significantly in favour of the elected organization, thus giving organizations a competitive advantage.

ICT also enables firms to electronically link value-adding processes [activities identified by Porter (1985:33) in his value chain model] and dispersed business units to share information, expertise and knowledge across the total organization. In different settings, ICT can profoundly affect one or more of the value activities, sometimes simply by improving effectiveness, sometimes by fundamentally changing the activity and sometimes by altering the relationship between activities (Applegate *et al.* 1999:71). Furthermore, ICT enables a change towards a new type of business organization, known as virtual organizations. These organizations no longer rely on bricks and mortar for containing and shaping them, but rather on ICT to enable them to compete in new and innovative ways. Many Internet-based companies are examples of virtual organizations. However, ICT is not only changing the structure of organizations and thereby opening new ways of competitiveness, but is also instrumental in establishing a 'knowledge asset' – leveraging the knowledge of individual employees to the benefit of other employees and the organization as a whole.

It is clear that ICT has an important role to play as a strategic resource. However, the true power of ICT lies in its ability to positively influence other resources (human resources, infrastructure and capital), thus achieving synergy. This synergy can only be achieved if ICT is managed according to proven economic and managerial principles. To quote Applegate *et al.* (1999:85): 'To make full use of the opportunities that IT presents, technical specialists must work in close partnership with managers. They (general managers and business managers) have detailed knowledge of the industry dynamics and the value chains for different areas of the business and can help identify the most appropriate path (strategy) to follow for implementation. Synthesis of the two worlds is thus essential.'

Are there any business models available to help us achieve this synthesis?

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4 Strategy formulation models

According to Byrne (1996), Pearce and Robinson (2000), Ward and Griffiths (1998) and other renowned authors, strategic management is an evolutionary process and will be the single most important management issue for many years to come. As early as the fourth century, general Sun Tzu, a Chinese military theorist, emphasized the need for strategy formulation (Sun Tzu 1971): 'What is of supreme importance in war is to attack the enemy's strategy.' During the 1950s and 1960s, strategy formulation was primarily based on master budget and long-term planning methodologies. The 1970s saw a shift in the way strategists perceived strategy formulation – the focus shifted to strategy crafting, analysing and predicting the future through predictive models, for example. The gist of these models was to find an optimal fit between the core capabilities (profile) of the organization and the environment in which it operated.

The turmoil of the 1980s caught organizations by surprise. Organizations were unable to adapt to an ever-changing business environment and started placing more emphasis on learning methodologies. Learning models emphasized the need for knowledge of previous experiences and mistakes. Fierce and ruthless competition of the 1990s forced organizations to rethink the strategy formulation process. It became clear that strategy formulation should

be an ongoing process of reinventing the organization to create the future. Transformational models became the talk of the day.

Each of the above-mentioned models has a different focus on strategy formulation, especially with regard to their interaction with the organization's profile and the competitive environment in which the organization functions. One can therefore assume that each of the mentioned models or perspectives will have a different node of interaction with ICT as a) a strategic resource; b) an integral part of the organizational profile; and c) a strategy within the business strategy. However, it seems that all the models agree that one must know the organization's key resources and core competencies or capabilities to sustain future competitiveness. As Mintzberg and Waters (1985:258) state: 'One of the great challenges that corporate strategists face is to know the organization's capabilities well enough to think deeply enough about its strategic direction.' Any proposed strategic management model intent on depicting the synthesis between strategic management and strategic ICT management would therefore not only include an analysis of the external environment, but also a thorough analysis of the areas of excellence in the company's profile. Given these models as a point of departure, what then is the best practice or model to employ when strategizing? Roberts (1998) states that: 'The companies that will prosper and outpace their competition during the next two decades will be those that will be able to out-think their competitors strategically, not out-muscle them operationally.'

The authors believe that the key to developing a model capable of synthesizing strategic management and strategic ICT management lies in the foundation of knowledge, especially knowledge of the area of excellence. Are all the above-mentioned perspectives or models not based on knowledge? In the predictive model, three ingredients are critical to the success of a strategy.

Firstly, the strategy must be consistent with the conditions in the competitive environment. Specifically, it must take advantage of existing or projected opportunities and minimize the impact of major threats. This is only possible with a sound knowledge of one's competitive environment (opportunities and threats).

Secondly, the strategy must place realistic requirements on the firm's internal capabilities (strong points and weak points). Knowledge of one's capabilities, core competencies and areas of excellence is therefore of paramount importance.

Thirdly, one's strategies should be based on the nurturing and deployment of core capabilities. To execute strategies successfully, knowledge and understanding of one's strategy should also be communicated throughout the organization. In collaboration with this perspective, the learning model emphasizes that organizations should become learning, knowledgeable institutions that build strategies around core competencies (areas of excellence).

Finally, the transformational model emphasizes that primary resources, areas of excellence and core competencies of different business units and organizations should be pooled as far as possible to form an extended value chain. Knowledge sharing and knowledge of core capabilities in the extended and/or virtual value chain are also paramount in the formulation and execution of a successful transformational strategy.

The livelihood of strategy therefore depends largely on the successful execution of functions performed in the chosen areas of excellence. Strategy must therefore be elaborate enough to consider an aspect such as organizational structure changes. In the words of Prahalad and Hamel (1990:84): 'We believe that senior management should spend a significant amount of its time developing a corporate-wide strategic architecture that establishes objectives for

competence building.' In essence, strategy should dictate how ICT should be used. At the same time, ICT should make new strategies and new ways of competing possible.

Unfortunately, none of the above-mentioned perspectives to strategy formulation really addresses the placing of an ICT strategy within a corporate or business strategy. However, these models or perspectives did provide a number of guidelines with regard to the possible placing of an ICT strategy within the business strategy. This enabled the authors to formulate a generic model that incorporates ICT not only in an adaptive and learning perspective, but also in a transformational mode.

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5 Different opinions about strategic ICT management

The different opinions about the formulation of ICT strategies are mainly determined by the changing role of ICT, its past and expected future evolution. In the seventies, ICT models were strongly based on a centralized, integrated concept derived from the mainframe origins. In his book *Strategy and Computers*, Wiseman (1985) suggests that the influential combination of the Anthony **three-tier structure** approach to defining organizational systems and the Nolan and Gibson **six-stage** model inhibited the strategic use of ICT until relatively recently. He states that 'up to 1993 at least, Nolan's general purpose approach to information systems (based in part on the Anthony model) is clearly incomplete, for it offers no guidelines for identifying or explaining strategic information system opportunities'. Friedman (1994) also criticizes the Nolan and Gibson model and suggests that the arrival of 'strategic systems' in the eighties introduced a new stage that fundamentally changed the concepts of how ICT evolves to 'maturity' in organizations and industries.

It is clear that the Anthony three-tier structure approach to defining organizational systems and the Nolan and Gibson six-stage model are useful starting points in understanding the institutionalization of ICT. However, the inability of these models to offer guidelines for identifying or explaining the strategic importance of ICT makes them virtually unusable in the quest to determine the interdependency between strategic management and strategic ICT management.

The arrival of 'strategic systems' in the mid eighties forced strategists to adapt a more top-down approach to the ICT strategy formulation process. As early as 1987, a letter by King (1987) to *Datamation* magazine stated that 'the potential of information as a strategic resource should be incorporated as a routine element of the business planning process'. Earl (1989:52) supports King's argument and suggests that businesses should 'concentrate on rethinking business by analysing current business problems and environmental change – and consider information technology as one ingredient of the solution.'

Ward and Griffiths (1998:31) believe that both King and Earl proposed a more interactive approach to strategy formulation – an approach where business strategy provides clear direction and guidance to the formulation of ICT strategies and, on the other hand, where the primary objective of ICT strategies is to determine what information and systems are needed to enable the delivery of the business strategy.

Given the changing environment, the main purpose of an ICT strategy should be to determine how best to deliver information systems that support business strategy through available technology. Naturally the question arises if there are any ICT strategy formulation models derived from the King and Earl perspective that can guide us in our quest to achieve synthesis between strategic management and strategic ICT management.

As early as 1990, Henderson and Venkatraman (1990) developed a theoretical model exploring the interrelationship between business and information technology (IT). The model, known as the theoretical construct of strategic alignment, was based on two distinct linkages, namely strategic fit and functional integration. According to Henderson and Venkatraman, strategic fit is the vertical linkage concerned with the integration of the external environment in which the firm competes (e.g. partnerships, alliances and core competencies) and the internal environment that focuses on administrative structure (e.g. human resources, product development and business process redesign). In essence, the achievement of strategic fit, as proposed in the Henderson and Venkatraman model, is similar to the achievement of a strategic fit as proposed in the predictive strategy formulation models described in the previous section.

Although Henderson and Venkatraman (1990) propose that business and IT strategy should be interrelated and linked, they do not specifically illustrate the interdependency and holistic relationship between the formulation of a business strategy and the formulation of an ICT strategy. Luftman, Lewis and Oldach (1993), Papp (1995) and Luftman (1996) build on the work of Henderson and Venkatraman and come to the conclusion that careful assessment of a firm's alignment is important to ensure that ICT is used to appropriately enable or drive the business strategy. Business strategy should therefore be chosen and implemented using the business infrastructure and processes to affect the ICT infrastructure. Haag, Cummings and Dawkins (1998:304) build on the work of King and Earl and state that 'the whole point of the ICT planning process is to find systems that enable the business to go where it needs to go'. To align organizational goals with ICT goals, they proposed five distinctive steps, appropriately named the Information Technology System Planning Process, as a foundation for identifying and selecting ICT systems. In the first step, the organizational and ICT goals are aligned to ensure that the business succeeds because of, not in spite of, ICT. The second and third steps identify specific processes and information that require ICT systems support. Once specific processes have been formalized, the fourth step is to evaluate the ICT systems for organizational 'fit', using methods such as cost-benefit analysis, risk analysis and capital analysis. The fifth and final step is to decide which ICT system the organization cannot do without. Haag *et al.* (1998:304) come to the conclusion that all the information applicable to the above-mentioned steps should be documented in a formal ICT systems plan. The plan is thus the road map for the use of ICT in the organization.

Wainright Martin *et al.* (1999:535) follow the same rationale as Haag *et al.* (1998), and also argue that ICT decisions must be tightly related to the direction of the business. However, Wainright Martin *et al.* (1999:536) go a step further and formulate a model or process that depicts the relationship between setting the overall direction for the business and setting the direction for information use and management within the business. They also state that this process may be applied to the entire company, a division or an individual user-manager department. The following section is a brief summary of the model proposed by them.

According to Wainright Martin *et al.* (1999:536), any strategy formulation process should start with an assessment of both the business, and information use and management. The second basic step is to visualize an ideal state for the future. Strategic planning is the third step and should be conducted for both the business and its information resources. In parallel with the business plan, a strategic ICT plan should be built considering the vision for the use of information and the overall management of ICT in the company. Wainright Martin *et al.* (1999:536) also believe that operational planning should lay out the major actions the organization must perform to activate its strategic initiatives. It typically includes a portfolio of projects that will be implemented according to priority or urgency.

It is interesting to note that the above steps follow a predictive approach to the formulation of strategy that is similar to the predictive strategy formulation model described earlier in this

article.

Frenzel (1999:67) follows a more transformational approach to the process of formulating an ICT strategy. He believes that business attitudes about strategy have changed and proposes that instead of trying to predict the future [like the predictive models of Pearce and Robinson (2000), and Wainright Martin *et al.* (1999)], businesses should try to create the future. Interesting enough, Frenzel is in agreement with King and Earl and states that the aggregation of all functional and business strategies should comprise a firm's complete strategy. Frenzel also proposes that strategic managers should reorganize and redeploy resources to attain competitive advantage. The purpose of an ICT strategy should therefore be to describe how ICT should support the firm's business goals and objectives.

Frenzel (1999:69) goes further and states that ICT strategies are most effective when the ICT goals and the firm's goals are internally consistent. Business strategies of the firm should therefore direct its functions towards business objectives. ICT strategies, on the other hand, should coordinate activities within or between ICT units. Frenzel also states that a functional unit may be required to develop a specific strategy to deal with a unique opportunity or threat. Once these stand-alone strategies (*ad hoc* actions) are accepted, they should be incorporated in the strategic plans of all organizational units that are affected.

Although all the abovementioned perspectives or models provide us with different viewpoints regarding the institutionalization of ICT (planning and/or strategy formulation), none provides us with a holistic model, illustrating the interdependency and relationship between the formulation of a business strategy and the formulation of an ICT strategy. The reason for this could be that strategic ICT management is still being seen and managed as an entity separate from strategic management. Fortunately, these models do offer some guidance in the quest to achieve synthesis between strategic management and strategic ICT management. Viewed holistically, they provide a list of factors that might be of strategic importance when formulating or incorporating an ICT strategy in a business strategy.

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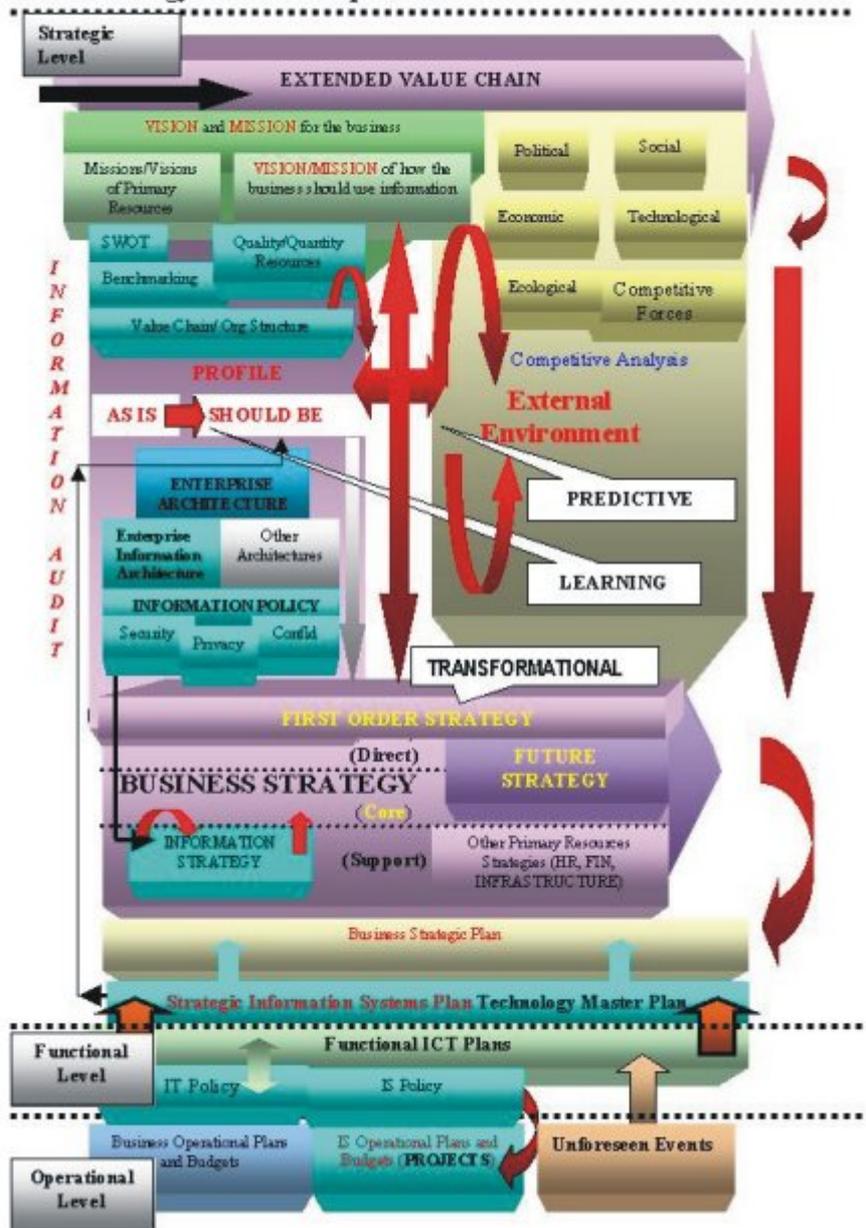
6 Formulating a generic model that incorporates ICT strategy formulation with business strategy formulation

By analysing all the different perspectives with regard to strategy formulation from a business and ICT point of view, it becomes clear that strategy formulation should be an *integrated process*, based on the excellence of execution of core capabilities. As illustrated in this article, ICT is not only becoming a resource of strategic importance, but it also has a profound effect on the achievement of a strategic fit between the organization and the environment in which it operates. ICT plays a major role in supporting primary strategies and strategies formulated from a predictive, learning and transformational perspective. *ICT strategy should therefore not be managed parallel to the business strategy, but should be an integral part of the business strategy.*

The authors propose a holistic strategy formulation model (see Figure 1), not only capable of incorporating the major principles involved in strategy formulation, but also capable of illustrating the interdependency between strategic management and strategic ICT management.

Figure 1 Generic model incorporating ICT strategy formulation with the business strategy formulation process

Fig 1: Generic model incorporating ICT strategy formulation with the business strategy formulation process.



6.1 Analysis of external and internal environment

As already mentioned, the key to developing a model capable of synthesizing strategic management and strategic ICT management lies in the foundation of knowledge. To build such a knowledge base, organizations should, as a point of departure, determine what their primary resources, core competencies, areas of excellence, value chain activities, opportunities, threats, and strong and weak points are. Any strategic planning process should therefore start with an analysis of the external and internal environment.

Organizations must conduct a competitive analysis to determine and analyse all conditions and forces in the organization's environment that might have a profound effect on the business as well as the effective and efficient use of resources, systems and services. It is important to remember that the core capabilities of the extended value chain should also be analysed. This means that an organization must define and understand its industry, identify its competitors and identify competitors' strengths and weaknesses to anticipate their moves. All these processes illustrate that ICT and ICT systems play a strategic role.

Apart from analysing the external environment, organizations should also assess the interrelation between business functions and how primary resources are structured to support these functions (e.g. human resource architecture, information architecture and technology architecture). This does not only constitute an evaluation of the alignment of organizational mission and goals, and the mission and goals of primary functions, but also an assessment of the design and working of the enterprise architecture, which comprises the main organizational architecture domains and their respective inter and intrarelations. In short, a business audit should be conducted.

If the business audit is conducted in an effective and efficient manner, it should provide strategists with a clear picture – a realistic knowledge of the 'as is' profile of the organization. After assessment of the enterprise's 'as is' profile, strategists must determine if this profile will ensure achievement of the organization's primary goals, current mandate and/or mission. This means that the organization must compare the 'as is' profile to the:

- core business of the organization;
- necessary processes to direct the business;
- necessary processes to conduct the core business of the organization; and
- necessary processes to support the business.

While determining the interrelationship between business processes, the flow of information must be determined. In essence, business processes are nothing more than an extension of the flow of information through an organization. Determining the flow of information will enable strategists to assess the flow of knowledge, which is crucial in determining interrelationships and interdependencies between business functions and processes. If the assessment indicates that ICT, ICT systems and ICT management are strategically significant in sustaining these processes and functions, an information audit should be conducted. As with any resource, the information strategy formulation and planning process should therefore be an integral part of the business assessment. Emphasis should be placed on the assessment of the use of information, information technology and information systems in support of core business functions and processes. This assessment should:

- examine the information needs in relation to the business driver's functions and processes;
- review the information flow and assets of the organization;
- measure how information resources are used within the organization and compare it to a set of standards these standards can be derived from past performance in the organization, technical benchmarks, industry norms, etc;
- examine the quantity and the quality of information resources, both technological and human; and
- examine the strengths and weaknesses of the organization's information management and organizational structure.

This assessment is a comparison between the logical or 'should be' profile of the organization and the current or 'as is' profile of the organization. Comparing the 'as is' profile with the 'should be' profile will lead strategists to identify a strategic gap. This strategic gap should be rectified through excellence of execution of core capabilities. The process of rectifying this undesirable gap is known as the organization's first-order strategy. All first-order strategies should therefore be based on identifying mistakes and realistically using primary resources to develop, nurture and deploy core capabilities to rectify previous mistakes and deficiencies.

It is clear that information, ICT and ICT systems are crucial to the effective and efficient assessment of the organization's profile and external environment. Not only do they enable the formulation of a business strategy, but they also serve as a corner stone in the foundation

of a firm's strategy formulation process.

Does the logic followed so far hold true for the ingredients that are critical to ensure success in both the predictive, transformational and learning perspective to strategy formulation, as formulated earlier in this document? Competitive analysis and assessment of the external environment will ensure that the first-order strategy is consistent with the conditions in the competitive environment. It will take advantage of existing or projected opportunities and minimize the impact of major threats. Secondly, assessment of the organization's strengths and weaknesses, and the way primary resources are structured to support business processes will ensure that realistic requirements are placed on the firm's internal capabilities. This will ensure that first-order strategies are based on the nurturing and deployment of core capabilities – capabilities not only based on the organization's areas of excellence, but also on the core capabilities of the different partners in the extended value chain. It is therefore clear that the proposed model holds true for the requirements critical to the success of a predictive, transformational and learning strategy.

Assessment of the external environment and company profile is of paramount importance in determining where the organization is and where it should be. However, the primary function of the assessment step is to enable strategic decision makers to determine how the competitive environment of the organization could change in the future and how the organization should take advantage of these changes. This constitutes a concerned effort to bridge the gap between where the organization is and where it should be. The first step in specifying the most effective and efficient use of any core capability (those capabilities on which your strategy should be based) is to set a strategic direction for the business – a mind's eye-picture of the future where the organization realistically wants to be. All external factors of paramount importance to the strategy formulation process should therefore be thoroughly analysed during the assessment step.

6.2 Setting objectives

In essence, when formulating winning strategies, businesses should try to anticipate and create the future. According to Pearce and Robinson (2000:64), the first step in setting a strategic direction for the business should be to formulate organizational goals for the future. This should be an organizational-wide (interactive) process. All stakeholders involved should reach agreement that these goals are obtainable. If primary goals should be linked to the core business of the organization, supportive goals must be derived from core business goals. A vision or mission statement must be linked to the future goals. During these formulation stages, social responsibility should be a critical consideration for strategic decision makers. Therefore, the vision or mission statements and future goals must express how the company plans to contribute to the societies that sustain it. Once the organization's future vision or mission is specified and written, the business implications of how the organization wants to operate in the future should be clear. The vision or mission statements governing the use of primary resources may then be written.

For a moment, let us once again focus on ICT as one of the primary resources. According to Wainwright Martin *et al.* (1999:539), the ICT vision or mission statement should set forth the fundamental rationale for the future activities of the ICT department. This means that the ICT department should be mandated to act as an enabler in ensuring the availability of appropriate information to support the strategic decisions in the organization. This mandate should therefore include the responsibility to improve the 'as is' information architecture to the 'should be' information architecture, thus developing a future information architecture that supports the core business processes of the future. All these statements and architectural artefacts should form the basis for developing an organizational information policy and an information strategy, which are based on the following principles: accessibility, quality, user

accountability, openness or free flow of information, security and confidentiality, privacy, cost and value, ownership or intellectual property, misuse of information, etc.

The information policy and information strategy should be seen as interdependent entities that are in constant revision of each other. Information strategy should not be confused with ICT strategy. The information strategy is in essence a higher-order strategy, derived from future ICT goals, and provides the framework for information management. To achieve objectives, targets and actions within a defined period, the information strategy should typically include a detailed expression of a non-negotiable information policy regarding these aspects. The information policy and information strategy thus provide governance to not only the formulation of ICT strategies, but also to business strategy. Note that to manage change, the ICT strategy must have the ability to amend, change and/or rectify the information policy and information strategy.

6.3 Establishing strategic initiatives

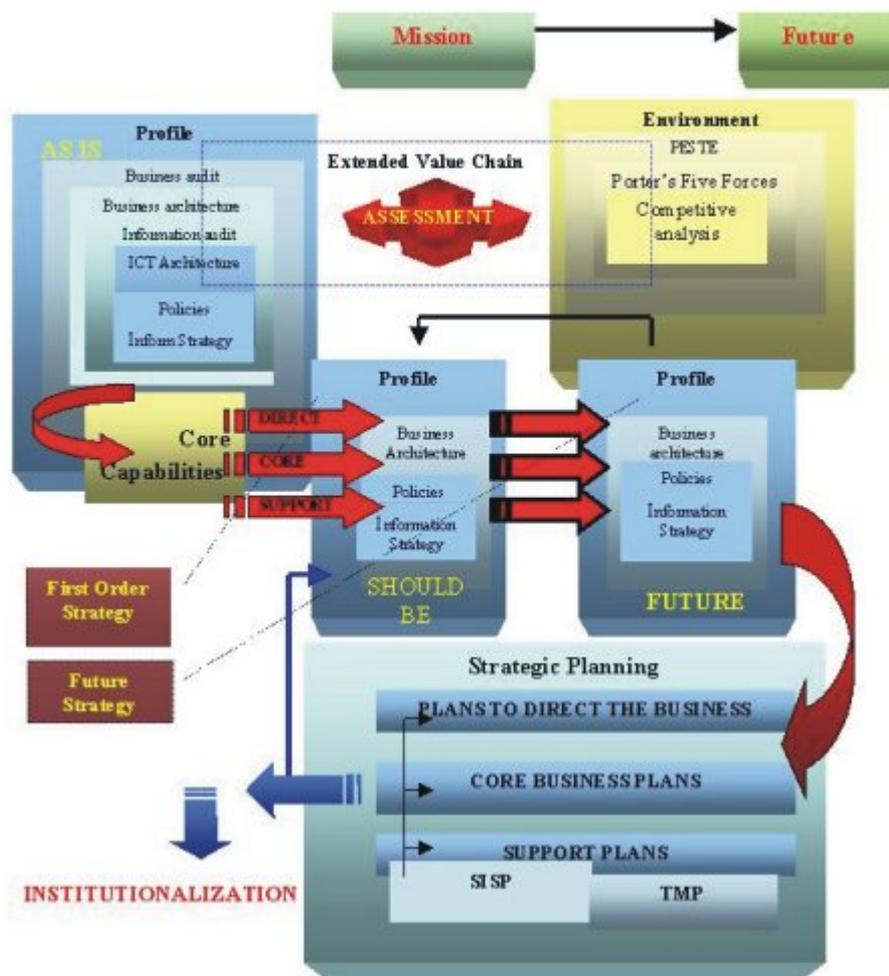
Simultaneous assessment of the external environment (now and in the future) and the organization's profile ('as is', 'should be' and 'future') will enable strategists to identify a range of possible attractive and interactive opportunities (see Figure 2). These opportunities are possible avenues for future investment (Pearce and Robinson 2000:13). However, they must comply with the following criteria:

- The organization's current and future mission or vision
- Non-negotiable policies (including policies contained in the information policy and information strategy)
- Organizational ethic
- norms and values.

These criteria must be met to generate a set of possible and desirable opportunities (Pearce and Robinson 2000:13). The screening process should result in options from which future strategic choices should be made. According to Pearce and Robinson, this process combines long-term objectives with generic and grand strategies to optimally position the firm in its external environment to achieve the company's future vision or mission and goals.

Figure 2 Establishing strategic initiatives

Fig 2: ESTABLISHING STRATEGIC INITIATIVES



Guidelines contained in these generic and supporting strategies should provide strategists with a basis to determine and allocate the necessary activities and resources to ensure that the organization grows and remains profitable. The formulation of directive, core business and supportive strategies should therefore be done in a holistic manner and should be an integral part of the overall business strategy formulation process. The purpose of the business strategy should be to direct the business towards the achievement of the envisaged future. Similar to goals, ICT strategies should support the achievement of the core business strategies. All organizational strategies should be based on the nurturing and deployment of core capabilities and strategies should therefore be built around core capabilities. This is a process of reorganizing and redeploying resources to attain competitive advantage.

The focus should once more be only on ICT as a strategic corporate resource. During the assessment of possible avenues for strategic ICT and ICT system formulation, strategists must ensure that attractive and interactive opportunities are screened through the guidelines provided by:

- the organization's current and future vision or mission statement;
- the ICT department's vision or mission statement (as derived from the organization's vision/mission statement);
- the core business strategy; and
- non-negotiable policy as contained in the information architecture (e.g. security, privacy and confidentiality).

This screening process should result in options from which strategic choice with regard to ICT should be made. The process is meant to provide a combination of long-term objectives and generic and grand strategies that optimally position the ICT department in its external environment. This will ensure that the vision and mission of the ICT department and corporate future vision and mission are achieved.

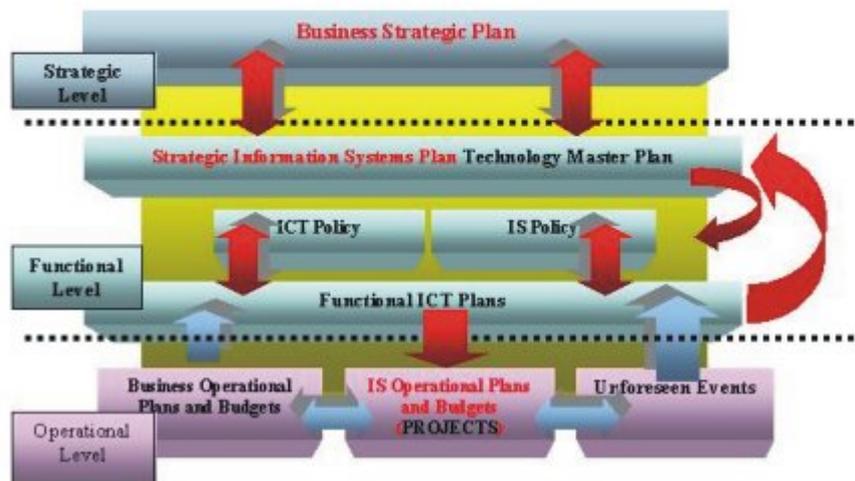
To implement strategies, hierarchies of plans must be formulated. Supportive plans should be formulated parallel with core business plans, with due consideration of the vision for the use of strategic resources and the overall management of resources in the organization. These plans should include executive plans, divisional plans and operational plans to institutionalize the core business strategy. These plans should also optimize the use of strategic resources (e.g. human resources, finances, infrastructure and ICT).

The information resource planning process should therefore generate a strategic information system plan (SISP) to govern the efficient and effective management and future institutionalization of ICT systems (see Figure 3). This plan should typically contain a 'set of longer-range goals that document movement towards the information vision and technology architecture and the associated major initiatives that must be undertaken to achieve these goals' (Wainright Martin *et al.* 1999).

The SISP should in a sense be a statement of the major initiatives that are not yet defined enough to be projects, but which the ICT department and user-managers must accomplish to move the organization towards the information vision and strategic plan, as derived from the core business plans. The SISP should outline the results desired for a specific time, as well as the major initiatives necessary. To determine how best to institutionalize the ICT systems via available technology, strategists must formulate a technology master plan (TMP). In contrast to the SISP, the TMP should specify the technology to be used. The SISP and TMP should also lead to a set of policies and guidelines for the effective use of 'in use' information systems and technology (e.g. e-mail policy, intranet policy and Internet policy). After the SISP has been developed, it must be translated into a set of more defined ICT projects with precise expected results, due dates, priorities and responsibilities.

Figure 3 Interaction between business operational plans, functional ICT plans and the strategic information system plan

Fig 3: The interaction between business operational plans, functional ICT plans and the Strategic information system plan



It is clear that an assessment of the external and internal environment, setting objectives and goals, and establishing strategic initiatives are crucial steps to efficient and effective strategy formulation. These steps must also be taken before an SISP can be formulated. An efficient and effective strategy formulation process is therefore a prerequisite to the formulation of an efficient and effective SISP. However, the operational plans of other support functions and functional owners are also of paramount importance in the formulation of the SISP.

Situations or changes may occur in the external environment as well as in the profile of the organization after the strategic assessment of these environments took place. These 'situations' are normally picked up by operational personnel and forwarded to functional owners. Remedial steps are therefore normally included in operational plans. Some of these situations or changes may, however, have a profound effect on the execution of core business activities. These situations or changes should therefore be forwarded to strategic decision makers for inclusion into strategy formulation. Unfortunately, strategy formulation is normally an annual event and therefore too slow a process for these unexpected situations. Earlier in this article, it was determined that this phenomenon gave rise to the birth of the learning as well as transformational approach to strategy formulation. For the proposed model to be predictive, learning and transformational at the same time, it is suggested that functional plans, for example the SISP, should play a major role. As soon as the SISP, for example, is approved, it should be rewritten into a policy document. This policy document should form the backbone for determining the 'should be' organizational profile and is therefore a crucial component in determining the organization's first-order strategy (synthesis between 'as is' organizational profile and 'should be' organizational profile). Assessment of the 'as is' and 'should be' organizational structure should therefore be an ongoing and an interactive process. Functional owners should therefore either take part in this process or at least have direct input to the formulation of the first-order strategy, which is based on learning from mistakes and is capable of transforming, dismantling and improving organizational structures on a continuous basis. This process should also prove sufficient for the stratification of emergent strategies.

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7 Conclusion

In the next century, the successful management of an organization's information resources will be determined by its ability to combine ICT knowledge with a thorough understanding of business strategy, thus guiding the development of information resources for the firm. Only with a combination of direction setting (setting a vision, architecture and a technology plan) and excellent management of the technology assets can an organization perform most effectively. The shift in the strategic role that ICT plays in business management is forcing business managers to actively participate in, if not lead, strategic ICT decision making. A sound understanding of the formulation of business strategy is crucial for the formulation of an efficient and effective ICT strategy, and vice versa. Unfortunately, there is no generic model that incorporates ICT strategy formulation with business strategy formulation. This leads business managers to still consider strategic ICT management as being separate from business strategy formulation, creating an inability to align ICT goals with corporate goals.

By analysing all the different perspectives with regard to strategy formulation from a business and ICT point of view, a holistic model was formulated. This model is capable of predicting the future, learning from mistakes and transforming strategic resources into core capabilities. Although the management of all organizational resources was included in this model, special emphasis was only placed on the management of ICT as a strategic resource. However, this model should only be used as a guideline or a tool to illustrate the interdependency between the management of a strategic resource (in this case ICT) and the formulation of a business strategy.

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