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# Integration of the Management Information System for Competitive Positioning

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## Abstract

The accelerating pace of technical innovation, coupled with a turbulent socio-political global environment, has created opportunities and challenges for companies in terms of competitiveness and sustainability particularly the manufacturing sector. Manufacturers in the developing world struggle to create knowledge and practice-based management information systems that will allow them to operate competitively in the global market. This paper explores the integration of organizational information systems for competitive positioning, using a case study of a manufacturing company operating in Sub-Saharan Africa. Our findings suggest the need for an integrated management information system that incorporates management practices based on research, knowledge management, and organizational learning and capabilities.

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## 1. Introduction

Manufacturers are experiencing a turbulent global environment that embodies challenges, opportunities, and uncertainties [25],[10]. While “the biggest problem in managing an organization today is failing to adapt to the changing world”, companies do not embrace this new environment due to custom [25]. As this attitude might prevent companies from being competitive in the global market, it is crucial for companies that they gain a broad understanding of the environment in which they operate. One driver of global competitiveness is information and communication technology (ICT), also called IT, which has created the global village that allows customers access to services or products anywhere at any time. This has significantly changed the way business is conducted in the 21st century and requires manufacturers to adapt in order to become competitive or sustain competitive advantage.

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Operating in the global market environment requires an adequate approach to the integration of management information systems for companies to be in a better position to obtain real-time data for better decision making. This means that manufacturers must develop new capabilities if they are to adapt rather than stagnate. It has been noted “companies that use ICT grow [sic] faster, invest more, and are more productive and profitable than those that do not” [25]. However, [1] stress that it is not easy to develop competitive advantage through IT, and [26] argue that this can be attributed to the lack of “creating a foundation for business execution by these companies”. An added challenge is that the global village is constantly changing as new developments are made in IT.

Research into success within the global market of companies in both developed and developing countries [26], [10], [25]. [33] suggests that companies lack an understanding of the constantly changing global environment and do not develop the IT-enabled business capabilities necessary for the emergence of sustainable competitive advantages. As a result, some manufacturers do not survive within the global market. According to [4], the potential benefits of IT have not materialized because strategic aim is not incorporated during the adoption and implementation of IT. This has resulted in manufacturers succeeding technically but still failing in terms of strategic business. These authors further note that Business Process Reengineering (BPR) involves justification and classification in relation to selection and implementation of the right IT systems. This paper reports on a study that explored how manufacturers can exploit management information systems for competitive positioning. The remainder of the paper is organized as follows: Section 2 highlights the problem statement, Section 3 presents the literature review and theoretical framework as well as the key elements of integrated management information systems for competitive positioning and Section 4 discusses the methodology used in the study. In Section 5, the results of the study are presented, with the interpretation and discussion of the results given in Section 6. Section 7 concludes the study and provides recommendations for future research.

## 2. Problem Statement

The rapid diffusion of new technologies has created a global village for companies, at the same time creating a turbulent environment that requires companies to be flexible, responsive and adaptive to survive. We have seen companies revising their business strategy but still not surviving in the global market or sustaining competitive advantage. Researchers claim that a misalignment between business strategy and IT-enabling business processes exists in companies [[26], [24], [29], [1] and [25] maintain that a company cannot survive “without understanding and dealing with the dynamic environment that surrounds it”. On the other hand, [24] claims, “aligning processes against business requirement involves identifying patterns in business requirements so that IT can be best employed to fulfil them”. However, he acknowledges that companies “struggle to obtain accurate business requirements because they fail to appreciate the difference between accuracy and precision” [24]. Thus, it is crucial for companies to gain a broader understanding of this global village in order to align their business strategy with IT-enabling business processes. Against this background, this study explores the challenges and benefits associated with the integration of management information systems for competitive positioning and proposes integrated management information system practice for achieving this.

## 3. Literature review and theoretical framework

“Information” is a buzzing word for companies’ top management and stakeholders because they believe that it is where return on Investment (ROI) lies or is guaranteed. From another perspective, the global marketplace environment is constantly changing and challenges companies’ managers in relation to crafting new business strategy. [8] define strategy as “the planning processes used by an organization to achieve a set of long-term goals”. [9] goes further to define strategy as “management’s action plan for running the business and conducting operations” and argues that “it consists of the competitive moves and business approaches that managers are employing to grow the business, attract and please customers, compete successfully, conduct operations, and achieve that targeted level of organizational performance”. Our viewpoint is that the turbulent environment that exists today can be attributed to the advancement and diffusing of information technology, which redefines strategy, especially when it comes to globalization. Thus, we view strategy as the planning and developing of a foundation for conducting business operations with an element of technological capability.

According to [25], companies cannot survive this unpredictable business environment unless they establish a broader understanding of its dynamics and incorporate this in their strategy. We note that most industries are moving towards IT-enabled self-service for the emergence of sustainable competitive advantage as an emerging global trend in the marketplace. At company level, this strategy incorporates environment scanning, developing an IT-enabling business process, and managing the company's information system.

### 3.1 Environment scanning

Researchers propose the environment scanning approach as crucial for companies to sustain competitive advantage [24], [34], [14]. [40] define environment scanning as “a systematic way for organizations to detect changes, and hence formulate adaptive strategies for coping with uncertain”. [14] describe environment scanning “as a kind of radar to scan the world systematically and signal the new, the unexpected, the major, and the minor”. These authors insist that this is the most considered method for scanning the external environment and forecasting, and can be used when an organization embarks on discovering the critical elements that influence the environment, such as political, economic, and social, to name a few. [10] challenge [14]’s view by arguing, “in human affairs – political, social, economic, or business – it is pointless to try to predict the future”. In fact, they propose that the key lies in strategic leadership practices because the changing global economy cannot be changed, or reserved for that matter. [10] define strategic leadership “as a person’s ability to anticipate, envision, maintain flexibility, think strategically, and work with others to initiate changes that will create a viable future for the organization”. In addition, [35] asserts that to attain broader and deepen knowledge through environment scanning, attention should be paid to specific areas, specifically in relation to strategic development. [39] suggest that the following environment scanning process model (Fig. 1) is appropriate for competitive positioning.

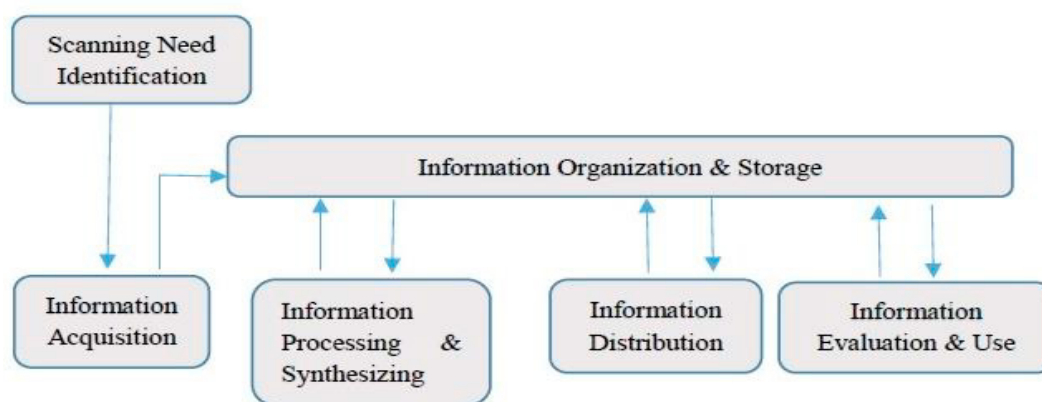


Fig. 1. Environment scanning model

### 3.2 Developing IT-enabling business capabilities

It is indisputable that success in developing IT-enabled business capabilities relies heavily on the information obtained from the environmental scanning process. In turn, [39] offer evidence that “operational and analytical IT-enabled dynamic capability had positive effects on business process improvement and corporate performance”. Furthermore, they argue that “IT-enabled dynamic capability allows organizations to design and reconfigure processes to improve efficiency, enabling new business forms” and “strategic IT capability contributes to competitive advantage development” [39]. [22] define dynamic capability as “the ability to integrate, build, and reconfigure internal and external competencies to address rapidly-changing environments” and they contend that dynamic capabilities have significant implications for theory and practice associated with environmental turbulence. In addition, they assert that the nature of dynamic capabilities derives from innovation-based competition, from which competitive advantage is gained. [26] suggest that environmental scanning is imperative for developing IT-enabling business capabilities to spot trends and best practices, which is a critical ability in a competitive market. It is important that information derived in this way be thoroughly analyzed and evaluated because acting on the wrong information might have negative repercussions.

[4] claim that, with regard to enhancing competitiveness, companies have successfully mastered the technical aspect of operations rather than the business aspect. [1] challenge this view by arguing that it is difficult to develop competitive advantage through technology. These authors argue that 50-75% of the companies that fail do so in the implementation phase. We also challenge [4] notion because we believe that companies generally attempt to integrate the right technology within their business operations. More importantly, [22] assert that: “the commonly accepted view that operational capabilities provide strategic advantage must be complemented by the realization that in turbulent environments, current operational capabilities may not match the rapidly changing environment.” Evidence of this focus on operational capabilities can be seen in research by [27], who believe that companies that have embedded technology in their processes can more effectively and reliably execute the core operations of the company and achieve “higher profitability, experience a faster time to market, and get more value from their IT investments” [27]. In addition, as mentioned earlier, [22] argue that, in turbulent environments, companies must be able to innovate, adapt and reconfigure themselves. With this in mind, they call for IT-enabled dynamic and improvisational capabilities that embed “the ability to effectively reconfigure existing operational capabilities to match the changing business environment” [22]. In order to accomplish this reconfiguration, these authors advocate a model of dynamic capabilities with four dimensions:

- “Sensing the environment: which is the ability to understand market needs and identify new internal and external opportunities, and pursue the need for changing the enterprise’s operational capabilities. This is essentially, the same as ‘environment scanning’.
- Learning: acquiring, assimilating, and developing new knowledge needed to reconfigure operational capabilities with new knowledge and skills.
- Integrating knowledge: embedding new knowledge into the new operational capabilities through a shared understanding and collective sense-making.
- Coordinating activities: orchestrating and deploying discrete reconfigured tasks, resources, and activities embedded in the new operational capabilities” [22].

The four dimensions of the model imply that existing knowledge forms a basis for the new knowledge; as a result, we emphasize the importance of knowledge management (KM) as an integrative field of IT infrastructure capabilities and one that enables the effective adoption of change.

#### **4. Methodology**

Empirical studies are often validated based on the methodology they adopt, which incorporates the appropriate execution techniques. [36] suggests, “the selection of research methodologies depends on the paradigm that guides the research activity, more especially, beliefs about the nature of reality and humanity [sic], the theory of knowledge that informs the research and how that knowledge may be gained”. The philosophical view of this study is that reality is constructed through knowledge and experience gained from interaction with our environment. This falls within the qualitative worldview as “a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant’s setting” [16]]. For this reason, a qualitative research methodology was considered appropriate for this study.

##### **4.1. Research approach**

The research approach adopted by this study derives from the epistemology and nature of qualitative methodology. [31] describe qualitative research methodology as “an inquiry process of understanding based on distinct and methodological traditions of inquiry that explore a social or a human problem”. The study employed an interpretive research approach in the belief that the participants’ views might be exactly or truly experienced since their views are constructed through values, norms, culture, and so on, which have shaped how they perceive the world [[18], [16], [17]]. The study attempted to explain company processes using a case study.

## 4.2. Research strategy

A single case study was conducted using a reputable company within the steel manufacturing sector. This company is a leading company in Sub-Saharan Africa and South Africa, in particular, and ranked 21st in the world in terms of global manufacturing global competitiveness index. In 2010, the company embarked on reengineering its business processes to improve general controls and to reduce the cycle time of decision making based on new technologies. The company aligns with international best practices and a comprehensive understanding of the steel business environment and ensures its continued global standing in competitiveness and participation in international markets.

## 4.3. Sampling techniques

[36] advises that in selecting a study sample it is crucial to apply proper strategy to obtain an adequate number of participants who can share appropriate knowledge. [36] suggest that purposeful sampling is appropriate for the selection of such participants. In brief, the study used the purposive sampling technique to carefully select the participants according to their relevance to and level of knowledge about the study. The study invited 15 participants who were experts in their individual field of specialization, with positions of system analyst III, system analyst, IT professional, system engineer, system use and top management. Of the 15 invited, 13 participants agreed to be part of the study.

## 4.4. Data-collection procedures

The study opted for the semi-structured interview as a data-collection instrument with the notion that interviews are appropriate for gathering in-depth data and allow respondents to express their views freely [18]. Data was collected through semi-structured interviews, which were tape recorded. In addition, notes were taken about non-verbal communication.

### 4.4.1 Data processing and analysis

The recorded data was transcribed into transcript text verbatim as the participants had expressed themselves during the interviews. In addition, the transcripts were read against the tape recordings repeatedly to prevent errors. In Vivo Coding was employed as an appropriate coding technique for this research as per the nature of qualitative inquiry [27]. The coding process loop, as adopted by [18], explicitly indicates the whole coding process as follows:

1. “The researcher read each transcript of the interview document, and wrote down the topics or themes that came out of each transcript.
2. The researcher then compiled a list of topics that were discovered from all the transcripts, and grouped the similar topics together.  
A table was then created by the researcher that captured and grouped these topics. These groups were made up for common topics, unique topics and leftovers.
3. The researcher then identified the descriptive words from the transcripts, which could be used for the created topics, and turned them into categories. The researcher then started to focus on reducing the list of categories by regrouping and merging the topics that related to each other.
4. The last step of the coding process involved finalizing the list of the categories, and then performing the preliminary analysis.”

In drawing these conclusions, the data analysis was undertaken of the descriptive words and final concepts that had been derived from the preliminary analysis. The descriptive words provided clear explanations of the challenges and benefits associated with the integration of management information systems for competitive positioning. Meanwhile, the preliminary analysis resulted in concepts and themes that informed the study of best practice associated with the integration of management information systems for competitive positioning. To put it in another way, the critical point is that transcripts were thoroughly read to broaden the understanding of the perceived challenges and benefits, especially concerning achieving competitive positioning. It is worth mentioning that this study was not intended to develop a model but rather to institute best practice related to the integration of a management information system.

## 5. Results

The study sought to explore the challenges and benefits associated with the integration of management information systems for competitive positioning. In order to fulfill the study objective, a single case study was considered appropriate, as it would allow us to gain a broader understanding from the experiences of one organization on the subject. The analysis of the interview transcripts suggested that the integration of management information systems for competitive positioning is subject to the alignment of the existing business strategy with information management systems. The study revealed that challenges are experienced concerning the technical aspect of aligning business strategy with an IT-enabling business process. This confirms our findings from the literature review that globalization has changed the global marketplace completely, and has created opportunities and challenges for companies and their respective nations, with a consequent global shift in talent, technologies, science and engineering. Regarding challenges and technical issues, the study found that organizations seek to strengthen their competitive advantage on the market through IT-enabling business processes. Yet companies face challenges associated with deciding which of the various technologies available in the market to use; the integration processes of the entire organizational system; and the operational costs involved. According to this case study, major challenges were encountered during the integration processes. The participants who were involved in the selection of the technologies indicated that some of the technologies were selected logically for their compatibility with the organization's current systems. Other technologies were considered according to their perceived potential. It is common knowledge that such technologies come with both new opportunities and challenges. These studies provide the following reasons:

- 1) Initially, there is a lack of understanding of the dynamics of the global environment.
- 2) Then there is a lack of alignment between business strategy and IT-enabling business processes.
- 3) The selection and integration of the appropriate technology is also a challenge.
- 4) The inability to ensure effective adoption of change (organizational change management) is the final challenge.

Adequate research has been cited in relation to obtaining a broader understanding of the dynamics of the global environment. It has been suggested that the most commonly used method of achieving this understanding is environment scanning, which must be conducted thoroughly to avoid overlooking crucial key elements. Consequently, this method might result in the collection of rich information or innovation that can contribute to the successful alignment of business strategy with IT-enabling business processes. As this process progresses, using the obtained information to formulate business strategy incorporating IT is perceived as the most challenging process, especially with the variety of advanced technologies. Our case study also revealed the technological aspect as the challenging one and it is further elaborated on in the next section. We observed that technological is required for companies and countries to keep up with a constantly changing global market with regard to competitiveness [7].

## 6. Discussion

Internet has created effective relationship linkages between companies and their suppliers, customers and the organization as a whole [21]. Companies that embrace these changes have sustained their competitive advantage. Two such companies are Wal-Mart and Toyota. In fact, Wal-Mart is the most studied company in relation to competitiveness and innovation because of its strength in the global marketplace. This company's "monitoring of consumer demand from points of sale through electronic cash registers, linking that information to central ordering directly to producers all around the world, thereby eliminating intermediates in production and distribution" [4] has allowed the company to compete successfully in the current environment. Another trend that has been noted within the global market is that companies and their respective nations are revising their ICT policies and investing billions in ICT infrastructure to facilitate the adoption of ICT. According to [8], "firms that use ICT grow faster, invest more, and are more productive and profitable than those that do not." As a result, we are seeing companies revising their business strategy to align it with IT-enabling business processes, which currently is crucial for companies to survive the constantly changing global environment. This has also been an element that has driven sustainable competitive advantage. To summarize, these are the dynamics of the emerging global trends for sustainable competitive advantage. Companies must broaden and deepen their knowledge in order to survive this environment. [37] observes that globalization requires companies to "have multiple competencies" to keep up with these constant changes, such as being "flexible, adaptive, responsive and innovative".

This implies global competitiveness will also force companies to review their strategies more often, specifically their technology strategy, which has resulted in advanced technologies such as BI systems, also called decision support systems.

## 7. Conclusions and Future Research

The study aimed at exploring the benefits and challenges associated with the integration of management information systems for competitive positioning, with the proposal of an integrated management information system framework for competitive positioning. The chosen study sample consisted 15 participants, of whom 13 responded. The study indicated that organizations seek to strengthen their competitive advantage on the market through IT-enabling business processes but that they encounter challenges regarding the technical aspect of aligning business strategy with IT enabling business processes. According to this case study, major challenges were encountered during the integration processes. These challenged the organization along several dimensions, such as technological capability; technical skills; cost; innovation; and licensing. This suggests that IT systems need to complement these capabilities to address the challenges encountered adequately. From the literature, it was found that while companies are overwhelmed by data they are in desperate need of information. This inability to integrate useful information is the result of the limitations of their management support systems and limited use of BI capabilities that are associated with enhancing decision-making processes and guaranteeing competitive intelligence. To counter the challenges indicated by our research, we propose an integrated management information system for competitive positioning.

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