

CHAPTER 6 - THE NEED FOR AN INDUSTRY-SPECIFIC STRATEGIC MANAGEMENT INFORMATION SYSTEM FOR SOUTH AFRICAN CONSULTING ENGINEERING FIRMS

6.1 Introduction

The essence of strategic management is in adapting strategy, either in reaction to or in anticipation of environmental changes. This adaptation requires an in-depth understanding (awareness, interpretation and anticipation of changes) of the external environment in which a particular business operates [189, 168, 68].

The external environment of South African consulting engineering firms was discussed in Chapters 3 and 4 of this study. It was illustrated in the discussion on the *macro-environment* that the transitional nature of so many aspects of South African society has resulted in an abnormally high incidence of change factors, which are "outside an individual company or even an industry's sphere of control". The macro-environment is therefore more important to South African consulting engineering firms than to most of their competitors and counterparts in developed countries.

The *industry* and *task* environments of South African consulting engineering firms were also shown to be in a state of continuous and highly turbulent change. The management of a consulting engineering firm should make strategic decisions based on its assessment of the firm's environment. A firm can then adapt to its environment and/ or it can shape some aspects of the *industry* and *task* environments to meet its needs. Since knowledge and understanding of the external environment is central to successful strategic management, the management of consulting engineering firms need systems that can provide

them with accurate information on their external environment, so that they can make appropriate and effective strategic decisions for their firms.

One of the management information system (MIS) categories defined in Chapter 5 was the *executive information system* (EIS). Executive information systems are management information systems tailored to the strategic information needs of top management. Top executives of consulting engineering firms get the information they need from many sources and computer-generated information has generally not played a major role in meeting the strategic information needs of top executives in consulting engineering firms.

In Chapter 5 it was shown that, during the intelligence stage of managerial decision-making, management information systems should scan both the internal organisation and the external environment and help identify problems and opportunities. This study will emphasise strategic management information systems that scan the external environment of a particular industry, namely the South African consulting engineering industry. This chapter will discuss the need for such an industry-specific strategic management information system (SMIS) and will investigate the required characteristics of a suitable SMIS for the South African consulting engineering industry.

6.2 Motivation

During the early 1990's it became evident that the environmental turbulence, which has come to characterise the modern business world, was changing the world of consulting engineering, both locally and internationally [91]. The political transition in South Africa, which culminated in the election of a

democratically elected government in 1994, introduced a new and entirely unknown and unpredictable dynamic into the South African business environment. The unique nature of both the transitional situation and the structural changes which was apparently taking place in the broader construction industry was such that conventional empirical management wisdom and solutions, which worked for many years, were often no longer applicable [78, 94, 79].

6.2.1 Lack of official industry information

The South African official statistical service, Statistics South Africa (previously Central statistical service or CSS, now STATSSA) [197] used to be responsible for periodic statistical surveys of the consulting engineering industry. These surveys historically took place every seven years [35], but the last survey of the industry was conducted in 1993. By 1995 it became evident that STATSSA was reducing the scope of their services due to budget cuts. At the same time they stated their intention of changing the focus of their services to enable them to provide statistics that could be used to measure progress towards new national development objectives. The limited availability of data sources on the South African consulting engineering industry was compounded by the fact that the periodic official surveys of the industry were not taking place and were likely to be discontinued for the foreseeable future due to the refocusing by STATSSA of its services.

Internationally, managers in both small and large enterprises are increasingly turning to environmental scanning to anticipate and interpret changes in their environment [15, 19] for strategic planning and strategic management purposes. The term *environmental scanning* refers to "screening of large

amounts of information to detect emerging trends, monitoring the actions of others and creating a set of scenarios" [167, 80].

South African consulting engineers had to improve their quantitative understanding of their broader industry, and in particular the impact of environmental changes on their industry, to enable them to respond appropriately to their business environment. The absence of official industry statistics for environmental scanning purposes became problematical to all participants in the consulting engineering industry:

- Large firms, who may have access to sufficient financial and human resources to collect their own data, had limited access to industry data, which other firms regard as confidential.
- Medium sized firms, small established firms and emerging firms all had the same access problem as large firms, but furthermore lacked the financial and human resources to collect their own data for environmental scanning purposes.

6.2.2 The SAACE initiative

It was during 1996, and against the backdrop of:

- The dire need for current and relevant business environmental information on the South African consulting engineering industry, which would enable participants to improve their understanding of the turbulent business environment in which they operate,

and

- the complete lack or non-availability of relevant and current official industry-wide statistical information

that the South African Association of Consulting Engineers (SAACE) expressed the need for an industry-specific management information system (MIS).

In order to address the unavailability of relevant and current environmental information, the SAACE envisaged a MIS that could provide the following:

- Industry trend information, preferably including trend forecasting, which could enable SAACE member firms to have a better understanding of their business environment for strategic management purposes.
- Detailed industry information, which could be used by individual firms for benchmarking themselves against selected industry norms and trends.
- Industry statistics, which could be used in the lobbying and liaison efforts undertaken by industry representatives.
- Information that could be used by the SAACE to improve their internal organisational management and to tailor their services in order to meet the changing business needs of their members.

6.3 Characteristics of a suitable system

The primary characteristic of a suitable strategic management information system (SMIS) is that it should permit strategic decision-makers to focus more precisely on the information that they need in order to make critical decisions that will affect their companies' future [73]. For the purposes of this study it is important to note that strategic management requires condensed, ad hoc, unscheduled reports, and external intelligence with a wide and forward-looking scope to support its more unstructured planning and policy-making responsibilities [127].

6.3.1 Information relevant to strategic management

The information that a suitable strategic management information system (SMIS) must provide for top management will primarily relate to decision situations on large strategic management issues [168, 101] such as:

- New business ventures
- Major additions to the core competencies of a firm
- Closure of mature or undesirable market interests
- Long-term market and service development
- Development of human resources in a firm
- Restructuring or re-engineering a firm including changes in corporate culture to adapt and prepare for the future
- Range of services offered, e.g. movement from mature services into new and developing or growth services
- Mergers and acquisitions
- Geographical office location

6.3.2 User-friendly reporting

In this case the SMIS should primarily focus on its primary users, i.e. the top management of South African consulting engineering firms. The system should however also make provision for customised or tailored reporting to suit the individual and very different needs of the other potential users of the SMIS. The following potential users and their respective needs were identified.

- Strategic (top) management who requires condensed reports with an industry-wide and forward-looking scope to support its planning and policy-making responsibilities.
- Tactical and operational managers who need more detailed and quantitative information, which may include benchmarking features, in order to evaluate feasibility and implications of strategic plans or to plan the implementation of such strategic plans.
- Lobbyists who need industry data, presented in an easily understandable and graphic format so as to be suitable for presentations to government officials, politicians and other industry stakeholders.
- Media liaison and public relations managers who require reports containing specific issue-related information in a format which could easily be included in press releases or press kits.

- Human resource managers in individual consulting engineering firms who need information on employment, recruitment, training and education trends in the industry.
- Financial managers who need information on operational financial issues such as debtor trends and operating capital requirements.
- SAACE management who needs information on industry trends such as geographical expenditure changes, employment patterns, nature of industry competition, as well as trends with regard to changes in the nature of the services and the disciplines offered by consulting engineering firms.
- Organisations who represent other participants in the broader construction industry (e.g. construction contractors, material suppliers etc.) that need information on the current phases of cyclical economic activity as experienced by the consulting engineering industry in order to assess the possible impact on their own industries (e.g. construction contractors, fabricators, material suppliers and others whose industries are downstream from the design activities of consulting engineers).

6.3.3 Current reporting

The period between the sampling date of either quantitative (snapshot) type data or qualitative (perception) type data and publication of SMIS reports must be as short as possible for the reports to be relevant and optimally useful to all the users identified in the previous section.

6.3.4 Confidentiality of data

It is of the utmost importance that the confidentiality of firm-sourced data must be ensured by instituting appropriate security systems as part of the SMIS. The financial and economic data of the individual firms are sensitive and the SMIS should therefore include a coding system of some kind whereby individual firms could not be identified by anyone other than a specific mandated person. Firms will have to be given an absolute assurance that their data will not be accessible to their competitors if they are to participate in regular surveys.

6.3.5 Statistically representative data

Sample data have to be sufficiently representative of the statistical universe. It will therefore be essential for the effectiveness of the SMIS that regular survey returns be obtained from a sufficiently large number of firms, but furthermore also from a good spread of firm sizes, from firms practicing in each of the provinces and from firms practicing in each of the disciplines.

All survey questionnaires should therefore be planned to be as user-friendly as possible to all participants in order to encourage participation by individual firms. Ongoing communication with firms should report on progress with the development of the SMIS and should furthermore clearly illustrate the specific value which participation in the regular surveys will have for the individual firm.

6.3.6 Affordability

The SMIS reports will be provided free of charge to SAACE member firms and other interested parties. The SAACE, as a voluntary business support

organisation, has a limited budget available for providing this service. In order to keep costs down the SMIS must therefore preferably be designed to integrate optimally with the SAACE's existing communication systems.

6.4 Conclusion and recommendations

The *macro-environment* as well as the *industry* and *task* environments of South African consulting engineering firms were shown to be in a state of continuous and highly turbulent change. The management of a consulting engineering firm should make strategic decisions based on its assessment of the firm's environment. The individual firm can then adapt to its environment and/ or it can shape some aspects of its environment to meet its needs. Since knowledge and understanding of the external environment is central to successful strategic management, the management of consulting engineering firms need systems that can provide them with accurate information on their external business environment, so that they can make appropriate and effective strategic decisions for their firms.

Internationally, managers in both small and large enterprises are increasingly turning to environmental scanning to anticipate and interpret changes in their environment for strategic planning and strategic management purposes. South African consulting engineers had to improve their quantitative understanding of their broader industry, and in particular the impact of environmental changes on their industry, to enable them to respond appropriately to their business environment. The absence of official industry statistics for environmental scanning purposes was problematical to all participants in the consulting engineering industry.

This study documents the development of a management information system to scan the external business environment of the South African consulting engineering industry in order to provide information to assist the management of individual firms in the strategic management of their enterprises.

The SMIS should primarily focus on the needs of the top or strategic management of South African consulting engineering firms, but it should preferably also address the needs of the following potential users of the system:

- Strategic (top) management
- Tactical and operational managers
- Lobbyists
- Media liaison and public relations managers
- Human resource managers
- Financial managers
- SAACE management
- Organisations representing other participants in the construction industry.



The SMIS should have the following specific characteristics:

- Up to date or current reporting
- Confidentiality of source data from individual firms must never be violated
- Data must be statistically representative
- The system must be affordable

The following chapter describes the research methodology used in the development of a SMIS for the South African consulting engineering industry.

