RISK MANAGEMENT INFORMATION SYSTEM
FOR The JAKARTA CONSULTING SERVICES FIRMS

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Abstract

This study documents the process whereby a practical and relevant industry-wide strategic management information system (SMIS) was developed for the Jakarta consulting service industry. The SMIS was designed to provide Jakarta consulting service with an improved understanding of the business environment in which they operate and to provide some advance warning of new trends in order to extend the strategic planning horizons of management and owners of consulting service firms. This was done against a background of very limited availability of current industry statistics.

A literature survey of available historical or secondary data relating to the Jakarta consulting service firms, building and construction industries was conducted in order to determine the relevance and usefulness of such data for the purposes of developing the SMIS. This survey provided background information on the consulting engineering industry, relevant aspects of the Jakarta business environment and the impact of changes in this environment on the local consulting service industry.

The importance and principles of strategic planning and strategic management are discussed, with specific reference to the nature of environmental scanning. The use of management information systems in the business environment is reviewed with specific emphasis on the application of management information systems in consulting service enterprises.

The quantitative secondary data collected in the literature survey was used as a benchmark or reference databank to calibrate and/or evaluate the accuracy of the information collected through ten regular industry surveys that were conducted to collect statistically representative primary data. The secondary and primary data were used to construct a number of time series for each of three key indicators of the health of the Jakarta consulting service industry, namely employment, salaries and fee income.

The SMIS developed, consists of a system to identify new key issues in the business environment and to decide on issues that no longer require further monitoring, a system of industry surveys at fixed intervals, using both quantitative and qualitative survey techniques, a system to capture and interpret survey data, updating time series for key business indicators with latest survey data, and producing reports on the state of the industry, including limited short term forecasts for business conditions.

The SMIS has proved it self useful and provides information to assist strategic management in the Jakarta consulting services industry, especially in decision situations regarding large strategic management issues. The system also manages to address the needs of other current and potential users of the system, such as operational managers, industry lobbyists, media liaison and public relations managers, human resources managers, construction contractors etc. The SMIS furthermore complies with all the specific criteria that were set at the commencement of this study, such as confidential handling of source data, affordability and sustainability and, by improving general understanding of the business of consulting services in Jakarta, contributes to the previously existing knowledge base.

Keywords: management strategic, risk, information system, services firms

Introduction

Risk is an important component of a company’s investment strategy. It is, thus, important to know the source of the risk, as well as to identify and evaluate factors contributing to risk. The relationship between the different types of risk is evaluated in this chapter, and the definition of risk, as well as the management thereof, is given and
explained. Reputation risk is introduced, and different indicators, whereby reputation risk can increase, are identified. Risk managers have a crucial part to play in responding to and preparing for reputation events. Extensive risk management procedures have to be integrated. Managers can only respond to reputation risk once they have identified traditional risks, and then worked out events that could impact reputation.

A company is vulnerable to all types of risk. Risk is inherent in business, not only because the organization operates in a risky environment, but also because the business itself is continuously changing. Certain risk relates to variability in returns caused by factors that are unique to the company, such as the type of industry in which the company operates, and the product that it sells. This is often referred to as unsystematic or unique risk. An investor may eliminate this type of risk by diversification. The other risk that remains is the non-diversifiable portion of the market risk. Variability in a share’s total returns, which is directly associated with overall movements in the general market or economy, is called systematic risk. Systematic risk directly encompasses interest rate, market and inflation risks, and cannot be avoided through diversification (Gitman, 1994:234).

Strategic management can be defined as the set of decisions and actions that result in the formulation and implementation of plans designed to achieve an organization’s objectives. The strategic management of an enterprise is the ongoing process of analysis, planning, and action that attempts to keep the enterprise aligned with its environment while capitalizing on organizational strengths and environmental opportunities and minimizing or avoiding organizational weaknesses and external threats. Strategic management is also a future-oriented, proactive management system. Successful strategic management therefore presupposes a thorough understanding, not only of the enterprise itself, but also of the enterprise’s external business environment. In the modern business environment characterized by accelerating, largely unpredictable and continuous change it has been recognized that business management practices, and in particular strategic management practices, furthermore requires continuous review and adaptation to remain relevant and appropriate. Strategic managers must therefore understand their current external business environment, but must also understand trends in order to anticipate changes in this environment.

**Strategic Management**

Strategic management involves the identification and implementation of plans of action in order to keep abreast of a rapidly changing environment and the demands of the modern world. It is an ongoing process whereby managers from all parts of an organization are involved in the formulation and implementation of strategic goals and strategies for the organization. Strategic management furthermore integrates the principles of strategic planning and management into a single process by which managers are encouraged to think strategically and to focus on long-term externally orientated issues and short-term tactical and operational issues. In the past the application, administration and fulfillment of rules and procedures were sufficient to ensure at least reasonable management performance. The business world however now demands an unprecedented level of adaptability and creativity from its managers. Managers consequently have to understand the environment in which their organizations operate and, more importantly, have the ability to identify and creatively exploit the opportunities and to foresee and effectively counter the threats, which environmental changes may hold in store for their organizations.

It should be obvious that strategic planning can no longer be an isolated activity, which is periodically carried out by a small number of senior executives at a retreat. To be of any use, strategic plans must be under constant review as the environment in which a company operates will change and so may its vision of where it wants to be. Formulating a
strategic plan is relatively easy when changes in the business environment are evolutionary and predictable. One can then extrapolate from the past and the present to determine what the future is likely to be and then set one’s strategic plans for the expected best and worst cases. Unfortunately, environmental changes are now normally unpredictable and they mostly occur as step functions. The past and even the present will therefore often not give sufficient, if any, advance indication of changes that may present a company with major opportunities or threats. Rapidly changing conditions will, to an ever-greater extent, require managers to be increasingly adaptable. The winners in tomorrow’s business world are those who move ahead of their environment and a continued devotion to fixed patterns and customs will cause an industry to lag behind while the world is changing.

**Risk Management**

The problem of risk management deals with the issue what risk intervention measures to implement to further reduce risk. Typically, a group of risk intervention measures is proposed and each of these risk interventions measures needs to be ranked in terms of its effectiveness. To evaluate intervention measure effectiveness in terms of risk, risk needs be defined as a quantitative metric. Multiple definitions of output metrics are possible in such evaluation. For example, risk intervention measure effectiveness may be expressed in terms of a reduction of exposure, of incidents, of accidents or in terms of consequences. Risk intervention measures follow the same classification of 4 different categories, i.e. those that intend to reduce: a). Exposure, b). Incidents given exposure, c). Accidents given an incident occurred, and d). Consequences given an accident occurred. Note that risk intervention measures in general intend to block *causal pathways*. For example, implementation of redundant propulsion systems attempts to block the incident of a single propulsion failure from resulting in an accident. Categories 1 through 3 intervention measures may be classified as prevention measures whereas category 4 measures may be classified as mitigation measures.

To test the effectiveness of risk intervention measures, assumptions will have to be made on the effect of a risk intervention measure on its operational quantity. For example, if one were to enhance maintenance policy and procedures one would have to assume a percentage reduction in e.g. propulsion failures after the implementation of the plan. This reduction of propulsion failures would have to be propagated through an overall risk assessment model to provide estimates in e.g. the reduction of expected number of accidents or reduction in number of expected fatalities. The maritime simulation model of the San Francisco Bay developed by the George Washington University combined with the knowledge acquired through the ABS workshops are a first step to allow for such evaluation of risk intervention effectiveness.

Figure 1 below summarizes the usefulness of the maritime simulation for testing risk intervention effectiveness by category and by output metric. The 0 indicates that the 33 risk interventions measures that intend to reduce exposure can currently be tested using the maritime simulation model in terms of the output metric “reduction of exposure”. All that is needed is the operational plan for each of these risks intervention measure e.g. where would traffic separation be established and in its subsequent representation in the maritime simulation model. If one were interested in the reduction in terms of the number of incidents, number of accidents or consequences of these 33 risk intervention measures additional modeling is required (as indicated by the X in Figure 1). Specifically, risk assessments models need to be developed that describe the incidence rates of incidents, accidents and consequences on a per interaction basis. Such models were developed in the Washington State Ferry Risk Assessment (see, Van Dorp et al. 2001).
Managing the Professional Service Firm

The principal characteristics of professional work result in certain definite lines of differentiation between the management challenges in a professional service firm and those in a company operating in the industrial and mass-consumer economic sectors. Managers in professional service firms must manage customized activities where very little can be reliably made routine. Management principles and approaches from other economic sectors, which are based on standardization, supervision and the marketing of repetitive tasks and products, are not only inapplicable, but may be dangerously wrong if applied in the professional services sector. Most professional services have a strong component of face-to-face client interaction. Success in the professional services sector therefore requires the development of a psychological or experiential component to the service as described by Toffler. This implies that definitions of quality and service take on special meanings and that these aspects must be managed with great finesse, requiring top performing managers to have very special interpersonal, intra-personal and other skills.

The characteristics of customization and client contact demand that the firm attract and retain highly skilled individuals. A primary consequence of this is that the professional service firm must compete actively in two markets simultaneously: the “output” (product) market for its services, and the “input” market for its productive resources, the professional workforce. It is the need to balance the often-conflicting demands and constraints imposed by these two markets that creates the special challenge of managing the professional service firm. Consulting engineering, more than most other professional services furthermore combines elements of professional practice and business. For example, giving engineering assistance and advice to a client, designing a project, and performing a wide range of other services for clients are professional acts. It is, however; equally true that an organization that seeks a profit as it handles millions of rand a year and employs hundreds or thousands of people is a business. Success in the management of consulting engineering firms therefore does not only require the ability to balance the demands and constraints imposed by the above-mentioned two (output and input) markets, but also the ability to strike the correct balance between sound business management principles and professional attitudes.
The Jakarta Business Environment in the year 2004

As part of the global economy, the owners and managers of Jakarta consulting engineering firms have to deal with the characteristic unpredictable environmental turbulence of the modern business world. Over and above this, however, they are also exposed to environmental change factors that are unique to the Jakarta business environment. These unique local factors have their origin in the combination of environmental characteristics resulting from the transition nature of Jakarta society and the vulnerability of an emerging market economy. The Jakarta political transition of the early nineties has naturally resulted in major national policy shifts. The resultant re-engineering of government functions and priorities has been an ongoing, often unpredictable, and sometimes poorly managed process. The process sometimes impacts negatively on private sector businesses, particularly those with a high level of dependency on government expenditure and those that are very vulnerable to the steadily mounting impact of new legislation, regulations, taxes and levies. It should however be stated that the Jakarta government is dealing with macro economic fundamentals in an extremely responsible way and is taking tough decisions, which will lay a foundation for long-term prosperity for all of Jakarta citizens.

The challenge for privately-owned firms, such as consulting engineering practices, is to improve their understanding of the environmental characteristics and the effects of the short term economic storms on their industry and businesses and thereby to improve management's ability to do effective and efficient strategic management. It is in the national interest to ensure that a major national asset, the Jakarta technological knowledge manpower resource, is kept intact to play its key role in the future growth and development of the Jakarta region.

Objectives

The primary objectives of this thesis were to investigate the impact on the Jakarta consulting engineering industry of recent business environmental changes in order to improve understanding of their external business environment and to develop a practical and relevant industry-wide strategic management information system (SMIS) for the Jakarta consulting engineering industry. This SMIS had to be able to provide Jakarta consulting engineers with an improved understanding of the business environment in which they operate and some advance warning of new trends, thereby extending strategic planning horizons of management and owners of firms.

Definition of a Consulting Engineer

In furthering an understanding of the profession or business of consulting engineering, it is necessary to explore the definition of a consulting engineer. Internationally the term "consulting engineer" is reserved for an independent professional engineer who performs professional engineering services for clients on a fee basis. Consulting engineers are independent contractors in the legal sense because they generally own and manage their firms and serve their clients in terms of a contractual arrangement. As independent contractors or agents consulting engineering firms normally serve a number of clients at the same time. Consulting engineers must be qualified by academic qualification, professional registration, and experience to practice and offer competent professional engineering services. Consulting engineers sell only service, time, knowledge and judgment and their compensation consists of fees paid by their clients for services rendered. The clients served by consulting engineering practices can be both domestic and foreign and can be industrial or commercial concerns in the private sector, financial institutions, and departments in any tier of government, international agencies, and even individuals. Consulting engineers serve some clients indirectly through services performed for architects and other design professionals or through associations with such professionals.
Any organization or individual in need of engineering services is therefore a potential client of a consulting engineer. Having such a potentially diverse client base and offering such a key service in any modern free economy, the consulting engineering profession can rightfully claim to be an important contributor to the international economy, and more particularly to the developing Jakarta economy. The relevance of this study, which has as its principal aim to develop a better understanding of the consulting engineering industry and its business environment in Jakarta, should therefore be obvious. A better level of understanding can contribute meaningfully towards more informed management decisions by the owners and managers of Jakarta consulting engineering practices with resultant improvements in the utilization, efficiency and effectiveness of consulting engineers as a scarce national economic resource.

**Evolution of the Consulting Engineering Profession**

Since the advent of consulting engineering in Jakarta nearly a century ago, the world of business has changed in many respects and the consulting engineering industry also had to adapt to changes in its operating environment or become irrelevant and disappear. In order to understand the modern profession or business of consulting engineering an understanding of these evolutionary changes should be developed.

Consulting engineering practices are business entities and can therefore be classified in terms of their form of ownership. The form of ownership has many implications for the management of consulting engineering practices and it is therefore essential to gain an understanding of both the preferred forms of ownership, the historic and other reasons for such preferences and the primary implications thereof. Historically, the legal status of the professional consulting engineering practice in Jakarta was that of either a sole practitioner or a partnership. The company as such was for many years reserved for commercial enterprises where the liability of shareholders was limited to the value of their shareholding in the company. The company’s liability was thus limited, but its way of operating was closely regulated and reported in compliance with legislation. With the passage of time this form of enterprise became the generally accepted legal basis for business operations around the world. The company was, as late as the middle 1970’s, not regarded as an applicable form of business for professional consulting engineering practices in Jakarta. The liability of shareholders and, in most circumstances, the liability of directors of a company was limited and this was considered to be in conflict with the unlimited liability of the professional person.

This gradual acceptance by stakeholders of more liberal business structures for Jakarta consulting engineering practices can primarily be ascribed to the following: client risk, with regard to the consulting engineering input in their projects, is currently mostly covered by professional indemnity insurance taken out by either the professional practice (for all its operations) or the client (for a specific project). Internationally the modern contracting trend is furthermore to identify, quantify and allocate risk in terms of all aspects of a project and not to have an unfair and unreasonable situation where it is expected of any of the contracting parties to accept unknown and un-quantified risks without compensation. Geographical spread of the larger partnerships have, with the passage of time, resulted in a situation where a partner could be held jointly and severally liable for issues over which he had no control or of which he may not even be aware. The advent of multi-disciplinary practices resulted in unacceptable situations where professionals in partnerships were being held jointly and severally liable for issues, which were totally outside their field of knowledge or expertise. The ever-increasing size and complexity of large projects resulted in a situation where the “protection” being gained by holding partners personally liable could often be insignificant when compared with the amount of potential claims.
The pool of professional engineers, technologists and technicians constitute a valuable resource in the economy of any country and even more so in a developing country. The Jakarta consulting engineering profession employs a significant proportion of this resource pool. It is widely acknowledged that services are the crucial force for change towards a global economy and that the next wave of world economic growth will mostly originate in the services sectors, especially in the area of intellectual services. In the era of globalization it is therefore imperative for any country to look after its services sector and especially its intellectual professional services sector. In the local environment, Jakarta consulting engineers furthermore have a key role to play in improving the quality of life of all Jakarta and of the people of the greater region. This role will primarily be to manage the creation of new infrastructure and to optimize the utilization and management of existing infrastructure.

In the light of the key role that consulting engineers can play in regional development as well as their potential for contributing to the economic success of Jakarta, it is important to improve our knowledge and understanding of the health, external business environment and dynamics of the local consulting engineering industry and thereby to optimize the management and utilization of these professional service firms.

**Strategic MIS for Jakarta Consulting Engineers**

A suitable strategic management information system (SMIS) should provide strategic management with information relating to decision situations on large strategic management issues 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 and geographical office location. Table 1 illustrates the extent to which the consulting engineering SMIS has succeeded in providing the industry with such strategic information.
### Table 1
Consulting Engineering SMIS with regard to generic Strategic Management Issues

<table>
<thead>
<tr>
<th>Strategic management issue</th>
<th>Information provided by SMIS</th>
</tr>
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<tbody>
<tr>
<td>New business ventures</td>
<td>Capital requirements (e.g., statistics on slow payment, trends with regard to the product cycle; statistics on typical income and expenditure); Profitability (e.g., profitability trends including 6 month forecast; statistics for differentiated firms); Level of competition and trends with regard to competition in the industry; Growth potential (e.g., geographical, service and client type growth trends); Utilisation of capacity (utilisation of current capacity and expected future utilisation); Confidence index as indicator of health and future potential</td>
</tr>
<tr>
<td>Core competencies</td>
<td>Detailed statistics on the size and growth trends with regard to 26 sub-disciplines or competencies including the regular identification of new competencies</td>
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<tr>
<td>Mature or undesirable market interests</td>
<td>Detailed statistics on the market size and growth trends with regard to 26 sub-disciplines or competencies including the regular identification of new competencies and services; Detailed statistics by client type or market size and growth trends; Detailed statistics by geographical area or market size and growth trends</td>
</tr>
<tr>
<td>Long-term market and service development</td>
<td>Statistical information limited to historical data and 6 month forecasts.</td>
</tr>
<tr>
<td>Development of human resources</td>
<td>Detailed statistics on staff composition by functional category and race classification; Statistics regarding expenditure on education and training; Statistics on recruitment trends and problems</td>
</tr>
<tr>
<td>Restructuring, Re-engineering, corporate culture</td>
<td>Detailed statistics on staff composition by functional category and race classification; Detailed statistics by client type or market size and growth trends; Detailed statistics by geographical area or market size and growth trends</td>
</tr>
<tr>
<td>Range of services</td>
<td>Detailed statistics on the market size and growth trends with regard to 26 sub-disciplines or competencies including the regular identification of new competencies and services</td>
</tr>
<tr>
<td>Mergers and acquisitions</td>
<td>Detailed data on the trends with regard to firm size (profitability, client base, debtor performance etc.); Geographical market sizes and growth trends</td>
</tr>
<tr>
<td>Geographical office location</td>
<td>Detailed statistics by geographical area or market size and growth trends</td>
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Sample data from each survey had to be sufficiently representative to give a semblance of data for the South African consulting engineering industry. It was therefore essential for the effectiveness of the SMIS to obtain regular survey returns from a sufficiently large number of firms. The sample furthermore had to be statistically representative in terms of firm size categories, geographic location categories and discipline or competency categories.
Surveys were therefore planned to be user-friendly in order to encourage participation by individual firms. Ongoing communication with firms was kept up throughout the study period. Communication reported initially on progress with the development of the SMIS and later on progress with individual surveys or survey reports. Periodic communication to all firms furthermore attempted to illustrate the potential value that regular participation in the surveys could have for the individual firm and reminded participants of the systems that assured confidentiality of their data.

**Conclusion**

The Jakarta consulting engineers, whose main business it is to supply technology-based consulting intellectual services for the built and natural environment, play a pivotal role in capital formation projects to the value of approximately R32,000 million per annum. This represents a significant amount in a small developing country economy with a gross domestic product (GDP) of R942.832 million and gross domestic fixed investment (GDFI) of R148.540 million. The strategic management of an enterprise is the ongoing process of analysis, planning, and action that attempts to keep the enterprise aligned with its external environment while capitalizing on organizational strengths and environmental opportunities and minimizing or avoiding organizational weaknesses and external threats.

An information system is a set of people, procedures, and resources that collect, transform, and disseminate information in an organization. Information systems can play a vital role in business success. They can provide the information that a business needs for efficient operations, effective management, and competitive advantage. A management information system is an information system developed primarily to provide information and support for effective decision-making by managers. Such information and support can be for the decision-making needs of strategic (top) management, tactical (middle) management, and operating (supervisory) management. The SMIS was successfully developed to have the following specific characteristics: An up to date or current reporting system, a system that ensures confidentiality of source data from individual firms, a system to ensure that primary data collected through surveys is statistically representative of the Jakarta consulting engineering industry.

The industry-wide strategic management information system for the consulting engineering industry complied with the primary criterion for such a system in that it provides strategic decision-makers with the previously unavailable industry information that they need to make critical decisions that will affect the future of their enterprises. The SMIS furthermore provided strategic management with much-needed information relating to decision situations on large strategic management issues such as new business ventures, core competencies, mature or undesirable market interests, long-term market and service development, development of human resources, restructuring, range of services, mergers and acquisitions and geographical office location. The SMIS achieved all the pre-set goals in terms of meeting the different management information needs of diverse industry stakeholders, such as top (strategic), tactical and operational management of consulting engineering firms, industry lobbyists, the media, human resource managers, financial managers and other construction industry participants.

**References**


