

Association for Information Systems AIS Electronic Library (AISeL)

PACIS 1995 Proceedings

Pacific Asia Conference on Information Systems
(PACIS)

December 1995

Guidelines for Strategic Information Systems Planning in Small and Medium Enterprises

Chi-Siong Tan

Government of Singapore Investment Corporation

Hean Poh

National University of Singapore

Follow this and additional works at: <http://aisel.aisnet.org/pacis1995>

Recommended Citation

Tan, Chi-Siong and Poh, Hean, "Guidelines for Strategic Information Systems Planning in Small and Medium Enterprises" (1995).
PACIS 1995 Proceedings. 48.

<http://aisel.aisnet.org/pacis1995/48>

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 1995 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

GUIDELINES FOR STRATEGIC INFORMATION SYSTEMS PLANNING IN SMALL AND MEDIUM ENTERPRISES

Chi Siong TAN
Government of Singapore Investment Corporation

Hean Lee POH, Lee Yong WOO
National University of Singapore

Small and Medium Enterprises (SMEs) constitute 90% of all establishments in the major economic sectors of Singapore. Many of them can become more competitive by adopting information technology (IT). This paper reviews the current work in strategic business and information systems planning (ISP), addresses some of the problems faced, and also assesses their suitability for small businesses. Some guidelines for an ISP framework for SMEs are then discussed. The framework uses simple tools to integrate business planning with IT to achieve competitive advantage.

1 Introduction

Small and Medium Enterprises (SMEs) have an important place in the Singapore economy. Although foreign investments have largely been responsible for Singapore's rapid progress and modernization in the last 25 years, local businesses have also contributed and prospered. To realise the goal of becoming a developed nation by the turn of the century, local enterprises in Singapore will have to stay competitive by applying new managerial and technological skills and know-how (NCB, 1992).

Information Technology (IT) is one such technology. There are many instances where IT, through proper planning, has been used by companies as a strategic weapon to help them stay ahead in today's highly competitive environment. A systematic methodology that provides a structural guide should be adopted for this planning process. Such a methodology is commonly referred to as the *Strategic Information Systems Planning (SISP)*.

Despite the growing number of theoretical frameworks for SISP, most have been developed with large organisations in mind. Many of them involve too many steps and require too much resources to implement. Research in the area of IS planning for small businesses has been limited and is often neglected. It is with this in mind, that the paper has been written. The paper will focus on the following areas.

- To examine processes, tools and techniques used in strategic business planning.
- To establish relationship between business and IT planning for competitive advantage.
- To examine processes, frameworks and methodologies for IS planning and assess their relevance for SMEs.

- And finally to propose guidelines and framework for a methodology that is applicable to small businesses.

2 Small and Medium Enterprises in Singapore

There are more than 65,000 SMEs in Singapore. These small businesses dominate the retail and wholesale trade, supporting industries and service sectors of our economy. Many capital-intensive, concentrated manufacturing industries and large MNCs here are also critically dependent on these small firms in their vertical chain. In the manufacturing, commerce and service sectors, SMEs constitute about 90% of all establishments, 44% of the total employment, 24% of value added, and produces 16% of the total direct exports, EDB (1989).

While Singapore continues to promote foreign investment, the need to foster growth in local enterprises has not been overlooked. For example, the SME Master Plan (1989) provided a blueprint and consolidated the national effort to promote enterprise development.

2.1 Business Practices and Concerns of Local SMEs

Separate surveys were conducted by Kau, A. K. (1988), Cheng, L. C. (1990) and the SMA (1992) to determine the business practices and concerns of local small businesses. Their findings revealed that the productivity, management skills, marketing expertise and technology of the SMEs are in general lagging behind the larger firms and their foreign counterparts. Most small firms either do not have a business plan (31%) or plan for a short period of less than one year. Few firms are aware of the importance of information and are hesitant to invest in expensive information processing equipment. Although, over the past two years, more firms have become more dependent on the use of computers and have been applying IT more extensively, less than 12% of all small firms actually uses IT for their primary business activities (NCB, 1994).

Escalating business cost remains a major concern for SMEs, and profits are constantly being eroded by keen competition in both the local and foreign markets. Singapore is fast approaching a turning point in its industrial development. The trend in the next decade will be towards high value-added industries. And for certain industries, the difference between business success and failure will increasingly become dependent on a company's

ability to make good use of technology or to introduce appropriate technologies.

Even though many small firms need not be at the forefront of high technology to succeed, they must acquire the capability to use technology to rapidly differentiate their products or services in a sustainable manner. IT is one technology that is now becoming more cost-effective, affordable and indispensable tool for small enterprises. Hence, the study of strategic information system planning becomes a timely one for the SMEs.

3 Strategic Business Planning for SMEs

Since the late 1970's, several authors have put forth their views on strategic management process. Some recent frameworks were suggested by David, F. R. (1991) and Pearce, J. A. (1988). Simplified strategic planning models for smaller businesses have also been proposed by Moyer, R. (1982) and Curtis, D. A. (1983). In most of these models, the following processes are common.

- Goal Formulation and Objective Setting
- Situation Analysis
- Strategy Formulation
- Strategy Selection and Implementation
- Monitoring, Control and Evaluation

Strategic management is a broader definition that encompasses strategic business planning, strategy implementation and its evaluation. Strategic planning defined by Curtis, D. A. (1983) is the process by which a business prepares to maintain its competitiveness in the marketplace. It aims at formulating a firm's long-term goals and strategies by examining the organisation on a broader perspective against its competitive environment. A strategic business plan typically includes the following components.

1. Mission statement
2. Strategic audit of the company and its environment
3. Goals and objectives
4. Business strategies
5. Critical success factors

It is generally accepted that one of the critical success factors for successful IS planning and implementation is the close linkage between IS strategy and business strategy, Baets, W. (1992). It is thus necessary to incorporate the planning aspects of the strategic business management process into any IS planning process.

3.1 Tools and Techniques for Strategic Business Planning

Many tools and techniques have been used for strategic business planning. In an article by Webster, J., William, E. and Bracker, J. S. (1989), some 30 different tools and techniques were discussed. Many tools and techniques are not directly applicable to small firms. For example, the

Boston Consulting Group matrix is only suitable for large firms with multiple product lines or business units.

A suitable subset of tools based on what each can offer and the skills required to use them can be employed by small firms for business planning. Curtis, D. A. (1983) listed competitive analysis, value-added analysis, cost analysis, and competitive advantage analysis as the few strategic planning tools that are applicable to small businesses. These we felt can be supplemented by tools to help assess external forces from customers, competitors, suppliers and regulators. In addition, we also agreed with Boynton, A. C. and W.Zmud, R. (1984) that using Critical Success Factor (CSF) analysis can be particularly effective in supporting such planning processes and in communicating the role of IT to senior management. All these tools are listed in Table 1.

3.2 Sustaining Competitive Advantage

Although many companies have successfully implemented IT to improve their strategic position, they represent only a small fraction of companies which had attempted to implement IS/IT strategically. More have failed to yield a spectacular return.

Separate studies by Bamberger, I. (1989) and Aaker, D. A. (1989) have been carried out to understand the critical factors to develop competitive advantage in small businesses. The results of both studies showed a high degree of consistency with product quality, service reliability, and good business image ranked at the top. In this aspect, small firms are similar to large organisations. Both have to satisfy the expectations of their customers; providing high quality, value for money solutions and services. Gaining competitive advantage via IT depends on the interaction between industry conditions and internal capabilities to identify and exploit opportunities, Johnston, H. R. (1988). According to Bhabuta, L. (1988), most of the time it is not the mere use of IT or any other technology that lead to competitive advantage but the deployment of such technology to support the business operations in the right manner. Matching the appropriate technology with the right business strategy mix therefore becomes the key for success.

3.3 Problems in Applying Strategic Planning

Planning in small firms is often characterized as being short-term, unstructured, incomprehensive and informal. This was highlighted by Smith, M. L. (1983), Sexton, D. L. and Van Auken, P. M. (1982), and Cheng, L. C. (1990). Lack of time, expertise and unfamiliarity with the many planning techniques and information sources are commonly cited as reasons for lack of business planning. The effectiveness of long-term strategic planning also often becomes questionable as small businesses are more susceptible to minor changes in the external environment than larger companies.

<i>Name of the Planning Tools and Techniques</i>	<i>Time and Cost</i>	<i>Form (skills)</i>	<i>Brief Descriptions</i>
1. Value Chain Analysis	Moderate Moderate	Qualitative skills	A diagnostic process for identifying and analyzing primary and support activities that add value to product or service.
2. Situation Analysis (SWOT)	Extensive Moderate	Qualitative skills	Systematic development and evaluation of past, present, and future data to identify internal strength and weaknesses, and external threats and opportunities.
3. Critical Success Factors (CSF) Analysis	Moderate Low	Qualitative skills	Identification and analysis of a limited number of areas in which high performance will ensure successful and competitive position.
4. Environment Scanning, Forecasting and Trend Analysis (PEST)	Extensive Moderate	Both	Continuous process of monitoring external factors, events, situations, and the projections or forecasts of trends (political, social, environmental and technological).
5. Competitive Analysis (Porter's Industry Structure)	Moderate High	Qualitative skills	Appraisal of five major forces: potential new entrants, buyers, potential product substitutes, suppliers, and competitors.
6. External Factor Evaluation (EFE) matrix	Moderate Low	Quantitative skills	Summarise and evaluate economic, social, cultural, demographic, geographic, political, governmental, legal and competitive information.

Table 1. Common Tools and Techniques for Strategic Planning
(Adapted from Webster J., Reif, W. E., Bracker, J. S., 1989)

Despite such problems encountered, we should not undermine the usefulness of a business plan to a small firm. Being difficult to implement does not mean that it should be dropped completely. Although the right amount and structure for planning varies from one company to another, most authors will agree that some level of strategic planning is always necessary. Studies have shown that firms engaging in strategic planning in fact out-perform those which do not. A summary of the surveys and findings to support these arguments can be found in the paper written by Pearce, J. A. and Robinson, R. B. (1984). In the paper, the authors suggested that the structure for small firms' strategic business planning should preferably cover shorter time horizon (under 2 years), and the process itself should not be too formal, sophisticated and time consuming.

4 Competitive Advantage and Information Technology

A strategic business plan defines 'what' can be done. Executing the plan requires the proper blend of resources and technologies and therefore considers 'how' it can be done. This section examines how IT could be used to create competitive advantage.

There are many articles describing models and frameworks to help companies exploit IT and implement information systems (IS) to improve their competitive posture in the industry. Michael Porter (1979,1985) described the industry structure and business competition

through the five competitive forces. These forces then together determine the industry profitability and how companies that reduce the impact of these forces can improve their strategic position vis-à-vis their competitors. Porter also described the three generic strategies for achieving competitive advantage: lowering cost, enhancing product differentiation, and focusing on market niches. Porter and Miller (1985) further suggested how a firm can put these generic strategies into practice through the use of a 'value chain'.

Several other writers have built upon Porter's work on competitive strategy to examine the strategic potential of IT. These include Rockart J. F.'s (1982) Critical Success Factors, Porter and Miller's (1985) Information Intensity Matrix, McFarlan F. W.'s Strategic Grid, Ives and Learmonth's (1984) Customer Resource Life Cycle, Wiseman, C. and Macmillian, I. C.'s (1984) Strategic Option Generator, and Sinclair S. W.'s (1986) on Three Domains of IT. They have come up with frameworks and models that are intended to help practitioners identify opportunities for exploiting IT in their own industry or firm. Because of its validity and wide acceptance, we suggest that Porter's frameworks and those listed in Table 2 be used by small business in their IS planning.

The whole process which encompasses strategic business planning to create a company's vision and goals and strategic use of IS/IT to help realising these goals, can be regarded as strategic information systems planning. A methodology packages all the frameworks and tools in a systematic manner to guide such a planning process.

<i>Authors, Models and Frameworks</i>	<i>Summarizing Key Points Raised</i>
<u><i>Critical Success Factors (CSF)</i></u> - Rockart J. F., Bullen C. V. and Bull L. (1982)	<ul style="list-style-type: none"> • Provides a mean for top-level executives to define their information needs by determining those factors that help them achieve successful operation. • Expanded later by Rockart and Bullen into a MIS planning tool.
<u><i>Information Intensity Matrix</i></u> - Porter, M. E. and Miller, V. E. (1985)	<ul style="list-style-type: none"> • Stressed how IT is changing the rule of competition and IT as a strategic tool for creating competitive advantage. • Information Intensity Matrix measures the information intensity of the value chain and information content of the product. The matrix can be used to predict the scope, degree and rate of change induced by IT for different industries.
<u><i>Strategic Option Generator</i></u> - Rackoff, N., Wiseman C. and Ullrich, W. A. (1985)	<ul style="list-style-type: none"> • Five types of strategic thrust (cost, differentiation, growth, innovation or alliance), three types of strategic targets (customer, supplier or competitor), two modes (offensive or defensive) and two directions (use or provide). • Matrix of strategic thrusts versus strategic targets helps identify areas in which IS can be adopted. • 'Mode' indicates whether the thrust is being used to attack or defend in the competitive arena. 'Direction' describes whether the firm is using the strategies options itself or providing it for the target's use.

Table 2. Achieving Competitive Advantage through IT: Three frameworks for Small Businesses

The next section examines some of the existing planning methodologies before one is proposed for small businesses.

5 Strategic Information Systems Planning (SISP) Methodologies

Lederer (1988) described strategic information systems planning as the process of identifying a portfolio of computer-based applications that will assist an organization in executing its business plan and realizing its business goals. Although arduous, strategic IS planning gives information managers the opportunity to identify broad initiatives, specific applications and critical technologies to help their organisations carry out their current business strategies more successfully, Parson, G. L. (1983), McFarlan, F. W. (1984), Ives, B. and Learmonth, G. P. (1984), Wiseman, C. (1984) and Clemons, E. K. (1986). It also offers them a means to identify opportunities for using information systems to create new business strategies.

IS planning is not something new and has been around for more than 20 years. Understanding what existing methodologies can offer helps to propose a suitable one for small businesses. The methodologies most commonly adopted here include the Andersen Consulting's Method/1, Lederer, A. L. and Gardiner, V. (1992), IBM's Business Systems Planning, BSP (1975), NCB's IS Planning Methodology (1988), and James Martin's Information

Engineering, IE (1990). The key characteristics of these methodologies are summarised in Table 3.

5.1 Problems with Existing Strategic IS Planning Methodologies

Although many large organisations conduct some form of IS planning, recent studies confirmed that despite the increasing number of frameworks and methodologies for SISP, severe problems do exist in the execution of a SISP. Some of these are listed in Table 4. The findings of Lederer, A. L. and Sethi, V. (1988), for example, challenged the utility of the planning methodologies which are in common use. Their results revealed that the overall satisfaction with the methodology, its resource requirement, processes, output and final execution were not particularly high. The authors also pointed out that IS planning methodologies may produce satisfactory plans but organisations often lack the management commitment and control mechanisms to ensure that they follow the plans. Simplicity in any proposed SISP methodology for small businesses can avoid some of the problems. We felt that what smaller firms require is one that is useful, easy to adopt and does not require too much resources.

<i>Methodology</i>	<i>IBM Business Systems Planning (IBM BSP)</i>	<i>James Martin Information Engineering (IE)</i>	<i>NCB Information Systems Planning (NCB ISP)</i>	<i>Andersen's Method/1</i>	<i>Rockart and Bullen's CSF methodology</i>	<i>Proposed SME SISP methodology</i>
<i>Focus</i>	Internal	Int and External	Int and External	Int and External	Internal	Int and External
<i>Time span</i>	12 weeks	24-52 weeks	26 weeks	N/A	VARY	4-5 weeks
<i>Emphasis</i>	Information systems planning to minimise inconsistencies	Build application rapidly through rigorous info req. specification	Identify goals, objectives and resource allocation	Competitive advantage and identifying projects	Elicit critical success factors and information requirement	Competitive advantage thru aligning IT with business strategies
<i>Focus competitive advantage thru IT</i>	NO	NO	NO	YES	WEAK	YES
<i>Continuity to analysis & design</i>	NO	YES	WEAK	WEAK	NO	NO
<i>Define data/models architecture</i>	YES	YES	YES	YES	NO	YES
<i>Automated tools</i>	NO	YES	NO	YES	NO	PROPOSED
<i>Strategic business planning</i>	NO	YES	YES	YES	NO	YES
<i>Info. requirement analysis</i>	YES	YES	YES	YES	YES	YES
<i>Resource allocation plans</i>	NO	YES	YES	YES	YES	YES
<i>Project planning</i>	NO	YES	YES	YES	NO	YES
<i>Design and Implementation</i>	NO	YES	NO	NO	NO	NO

N/A Not Available

Table 4. Comparison Chart of Different IS Planning Methodologies

<i>Relevant Problems Highlighted in Lederer, A. L. and Sethi, V. (1988) Study</i>	<i>Implications on Small Firms</i>
1. Difficult to secure senior management commitment for implementing the plans Difficult to convince senior management to approve the methodology.	May be more severe if the management is from a 'older' generation as in many small businesses. They may not readily accept new technologies.
2. Implementing the projects and the data architecture identified in the plan requires substantial further analysis. Methodology fails to take into account issues related to plan implementation.	Strategic plan should provide long term directions. The plan is a useful guide for implementation which can stretch over 2 to 5 years. Small firms that do not have the expertise nor the resources to undertake the complexity of managing technology may find outsourcing a good option. Detailed project planning may not be necessary.
3. The success of the methodology greatly depend on the team leader. It is difficult to find a team leader who meet the criteria specified by the methodology.	More severe given the lack of expertise. A simpler methodology may ease this problem.
4. The planning exercise takes very long. The methodology lacks sufficient computer support.	Methodology should not have too many steps and should not take too long to complete.

Table 4. Problems with SISP and their Implications on SMEs (Lederer, A. L. and Sethi, V., 1988)

6 SISP Methodology for SMEs: Some Practical Guidelines

An IS planning methodology targeted for SMEs should attempt to address those problems mentioned earlier. We felt that the following guidelines can serve as the basis for formulating such a methodology.

1. The methodology should be structured, easy to understand and use. It should not be too lengthy or too technical. Many existing methodologies developed for large firms are complex, time-consuming and require too much resources to implement.
2. Instead of re-inventing tools, existing planning tools and models should be used. Frameworks such as the Porter's Industry Structure and SWOT analysis have been widely adopted and are easily understood.
3. Business planning should be included and integrated with IT planning. In many instances, successful implementation of information systems is a result of using appropriate IT to support the right business strategies.
4. The methodology should not only examine information systems that improve efficiency and productivity but also be able to identify strategic information systems that will help position the company at a competitive edge.
5. The planning process should provide a direction for the firm's computerisation in the next 2 to 5 years by developing an IT blueprint for the company. This should integrate any existing and future systems to eliminate redundancies and inconsistencies.
6. The derived IS plan should identify and establish priorities and time frame for the development of information systems. A planning schedule to guide the

implementation of the methodology would also be useful.

7. The methodology should include activities to stimulate creativity and thinking. Conducting an IS planning exercise can promote organizational learning especially among the senior managers and focus their attention and awareness on the importance of IT.

Based on the guidelines above we propose an integrated business and IS planning framework as shown in Figure 1.

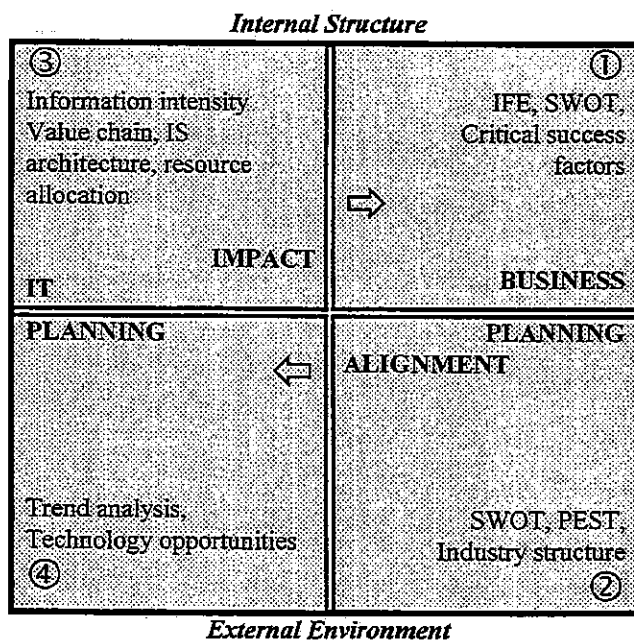


Figure 1. Simplified SISP Framework for SMEs

The most important criterion for a successful implementation of IT in business is that the effects and implications of IT are in line with corporate business strategies. This framework ties business planning with IT planning. Within each quadrant are some simple tools for the purpose. Business strategies are first developed by assessing external opportunities (Quadrant 2) against company's internal strengths and weaknesses (Quadrant 1). They serve as the basis where IT may possibly be used. Formulating IT strategies then involves evaluating company's information requirement (Quadrant 3) alongside technology opportunities (Quadrant 4). The usage of IT are strategically aligned with its business operations to help the firm achieve its goals and objectives.

Based on this framework, we then develop a four-phase methodology. The different phases each having a number of steps, techniques and tools are shown in Table 5.

Phase 1, *Preliminary Assessment*: this is intended to provide management with a quick assessment of the potential of using IT in their business. The objective is to introduce the SISP methodology to the management and to obtain endorsement from the CEO before proceeding further.

Phase 2, *Business Strategy Analysis*: the emphasis is to understand the nature of the business, and to help formulate business objectives, goals and strategies. It also examines the potential role of IT in that industry and the business.

Phase 3, *Strategic IT Planning*: the aim is to match business strategies with IT opportunities and to assess the information requirements of the business at a high level so as to construct a business information architecture that will satisfy those requirements.

Phase 4, *IT Implementation Planning*: the final phase tries to map out functional requirements and resources needed for each IS application domain. It performs a cost, benefit and feasibility assessment to select appropriate applications for implementation. This phase also concludes the planning exercise with the preparation of a strategic IS planning report and a presentation of the key findings and recommendations to the management.

7 Field Testing the Proposed Methodology

A strategic IS planning exercise was conducted using the above proposed methodology with a small air freight company in Singapore. It illustrated how a small firm can plan for its IS/IT needs in a systematic manner. The field study could possibly be written as a separate paper, readers can refer to Tan, C. S. (1993) for full details on the methodology and field study.

Data for the field testing were collected primarily through structured interviews and secondarily through field trips and reviews of reports, brochures, trade journals and newsletters. Worksheets and checklists helped to guide and collect the relevant data from each interview.

The exercise provided an opportunity for us to use the recommended tools and techniques. It helped to verify the

sequence of steps and allowed the team to assess the usefulness of each activity that was specified in the proposed planning methodology. Several ideas which have surfaced during the field testing are worth mentioning here.

- *Information volume and complexity* - This can be added as another dimension to the Porter's information intensity matrix. A "high-high" information volume and complexity often indicate good potential for using IT.
- *Information content of product and services* - Brainstorming on ways to increase the information component of both product and processes can help a firm to differentiate their product or services from their competitors.
- *Roles and impact of IT* - The role and impact of IT need to be considered simultaneously and viewed from a broader perspective. This was achieved by examining the internal operations of the firm (through Porter's value chain analysis) and external competitive forces (through Porter's industry structure analysis)

This entire exercise was completed over a period of 6 weeks, during which the team focused on understanding the air-freight business and formulating strategic business and IS plans. We looked at existing applications used in the industry and identified some areas which are relevant to the company. We felt that immediate benefits could be reaped from implementing an air-freight management system to help manage the daily operations and that the company's participation in sector-wide air cargo network (electronic market) could be a strategic IT move.

The strategic IS planning exercise had been beneficial to the firm. Even if the firm were to decide not to implement any system, the senior managers agreed that an awareness has been established and it had helped them focus on industry trends so that they could be more competitive through the use of IT.

The team also agreed that strategic IS planning, like any other form of planning, should be regarded as an ongoing activity. The plan should be adjusted and fine-tuned from time to time, taking into consideration changing needs, emerging competitive forces and opportunities. And, if a strategic plan were simply prepared and shelved, little would likely be derived from the effort expended to make the plan. Much of the impact of the plan would have been lost!

8 Conclusion

Good planning often stimulates learning. There is strong evidence that the ability to learn and to adapt to changing environment, especially among the senior management and decision makers of an organisation, is the key to survival and renewal, Genus, A. P. De. (1988).

IS planning therefore should be viewed as being an integral component of business planning. Conducting an

	<i>Phase 1: (1 week) Preliminary Assessment</i>	<i>Phase 2: (2 weeks) Business Strategy Analysis</i>	<i>Phase 3: (3 weeks) Strategic IT Planning</i>	<i>Phase 4: (2 weeks) IT Implementation Planning</i>
Objectives:	Quick assessment to the potential of IT in the company under study.	Strategic understanding of the business. Formulate long-term business objectives and strategies.	Match business strategies with IT opportunities.	Provide recommendations for the implementation of systems.
Main steps:	<ol style="list-style-type: none"> 1. Obtain information on company's operation (e.g. size, scope, process, market share, product etc.). 2. Assess information intensity of company's value chain and product (internal). 3. Assess company's competitive environment (external). 4. Identify IT trends and technology relevant to this industry. 	<ol style="list-style-type: none"> 1. Define nature of business and mission statement. 2. Perform situation analysis using PEST, value chain, SWOT, and industry structure analysis. 3. Formulate strategy - a. match strengths, weaknesses with threats, opportunities, b. Identify important industry and firm's CSFs, c. Establish long term objectives, d. Match objectives with generic business strategies. 4. Identify aggregate information requirements. 	<ol style="list-style-type: none"> 1. Identify basic application areas and also systems that are more strategic. 2. Match business strategies and objectives with IT opportunities. 3. Assess role and impact of IT to help achieve step 2. 4. Identify main business entities and information flow in the company's operations. 5. Define business information architecture and scope of all information systems. 	<ol style="list-style-type: none"> 1. Define all computing, human, communication, data and applications requirement... 2. Recommend acquisition decision. 3. Prioritize, rank, and then select projects based on different factors/constraints.
Tools/Techniques:	<ol style="list-style-type: none"> 1. Introductory workshop 2. Coy. operation checklist 3. Info. Intensity matrix 4. Competitive business and IT environment checklist 	<ol style="list-style-type: none"> 1. PEST analysis 2. Value chain analysis 3. Industry structure analysis 4. SWOT analysis 5. CSF interviews 	<ol style="list-style-type: none"> 1. SIS brainstorming session 2. IT opportunity matrix 3. Data flow modelling tools 	<ol style="list-style-type: none"> 1. Feasibility analysis 2. Capacity planning 3. Cost & benefit analysis
Deliverables:	<ol style="list-style-type: none"> 1. Company's IT potential assessment 2. Recommendation to proceed to Stage 2 or abort 	<ol style="list-style-type: none"> 1. Company's internal & external assessment 2. List of CSFs 3. Mission statement, long-term objectives and strategies 	<ol style="list-style-type: none"> 1. List of IT Opportunities. 2. a. Bread & Butter applns b. Strategic applications 3. Business processes and information flow 4. Business information architecture 	<ol style="list-style-type: none"> 1. Information systems portfolio 2. Prioritized projects 3. Requirement specifications 4. SME SISP report

Table 5. Proposed Strategic Information Systems Planning Methodology for Small Businesses

SISP exercise provides such a valuable learning experience. Even when strategic plans are not fully implemented, the IS planning process would have helped to bring about awareness and educate top management about the roles of IT in their organisation and its potential use in the future.

Research in the area of strategic business planning for local small businesses has been thin. While many authors have suggested on how small firms can formulate their business plans, how to go about developing a strategic IS plan is not obvious. This paper provides some starting ground for further research on this important, but neglected, area in MIS.

References

- Aaker, D. A. "Managing Assets and Skills: The Key to a Sustainable Competitive Advantage." *California Management Review*, Winter 1989, pp. 91 to 106.
- Bamberger, I. "Developing Competitive Advantage in Small and Medium-Size Firms." *Long Range Planning*, 1989, Vol. 22, No. 5, pp. 80 to 88.
- Baets, W. "Aligning Information Systems with Business Strategy." *Journal of Strategic Information Systems*, September, 1992, Vol. 1, No. 4.
- Bhabuta, L. "Sustaining Productivity and Competitiveness by Marshaling IT." *Information Technology Management for Productivity and Competitive Advantage*. IFIP TC-8 Open Conference, 7-8 March, 1988, Singapore.
- Boynton, A. C. and W.Zmud, R. "An Assessment of Critical Success Factors." , *Sloan Management Review*, Summer, 1984.
- Cheng, L. C. *Strategic Management for Small and Medium Enterprise in Singapore*. Academic exercise submitted in partial fulfillment of the requirements for the Degree of Bachelor of Business Administration with Honours, National University of Singapore, January 1990/91.
- Cheng, W. "Strategic Information Planning." Proceedings of the Singapore Computer Society Third Annual Conference, December, 1986.
- Clemons, E. K. "Information Systems for Sustainable Competitive Advantage." *Information and Management*, November, 1986, Vol. 10, No. 4, pp. 131-136.
- Curtis, D. A. *Strategic Planning for Smaller Businesses*. D.C Heath and Company, Canada, 1983.
- David, F. R. *Concepts of Strategic Management*. 3rd edition, Maxwell Macmillian Pub., New York, 1991.
- Economic Development Board (EDB). *Small and Medium Enterprise Master Plan*. The SME Committee, Singapore, May 1989.
- Genus, Arie P.De. "Planning as Learning." *Harvard Business Review*, March-April, 1988.
- IBM Corporation. *Business Systems Planning - Information Systems Planning Guide*. IBM's Publication, 1975.
- Ives, B., and Learmonth, G.P. "The Information System as a Competitive Weapon." *Communications of ACM*, December 1984, Vol. 27, No. 12, pp. 1193-1201.
- Johnston, H.R., Carrico, S.R. "Developing Capabilities to Use Information Strategically." *MIS Quarterly*, March 1988, Vol. 12, No. 1, pp. 37-48.
- Kau, A. K. *Business Practices of Small and Medium Enterprises in Singapore*. Singapore, 1988.
- Lederer, A. L. and Gardiner, V. "The Process of Strategic Information Planning." *Journal of Strategic Information Systems*, March 1992, Vol. 1, No. 2.
- Lederer, A. L. and Sethi, V. "The Implementation of Strategic Information Systems Planning Methodologies." *MIS Quarterly*, September 1988, Vol. 12, No. 3.
- Martin, J. *Information Engineering: Volume 2 Planning and Analysis*. Prentice-Hall Pub., 1990.
- McFarlan, F.W. "Information Technology Changes The Way You Compete." *Harvard Business Review*, May-June, 1984.
- Moyer, R. "Strategic Planning for the Small Firm." *Journal of Small Business Management*, July 1982, Vol. 20, No. 3, pp. 8-14.
- National Computer Board. *NCB Information Systems Planning Manual*. First Edition, Singapore, 1988.
- National Computer Board. *Survey Report on Usage of Information Technology in Singapore*. Singapore, 1994.
- National Computer Board. *Vision of an Intelligent Island: IT2000 Report*. April, Singapore, 1992.
- Parson, G. L. "Information Systems: A New Competitive Weapon", *Solan Management Review*, Fall, 1983, Vol. 25, No. 1, pp. 3-14.