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APPENDICES

APPENDIX A

THE EXECUTIVE SUPPPORT SYSTEM (ESS)

APPENDIX A
THE EXECUTIVE SUPPORT SYSTEM (ESS)

1. The Introduction of the ESS

Nowadays, there is little disagreement on the potential uses of information technology as a competitive weapon in today's business. Companies have realized many opportunities for improving their business performance through the development and use of information systems. It is now almost impossible to operate any businesses without assistance from computer whether they are large or small companies.

In many large or medium companies where resources are readily available, information systems are considered as a necessity to remain competitive. They usually have their own IS managers or otherwise they hire the consult companies to design or develop the effective systems for them. On the other hand, many small companies can not afford to do that. They usually have limited personnel and time to allocate for this matter. Many of them also have little or no experience about strategic information systems planning. The development of information systems is then usually lack of sufficient analysis or consideration for their particular competitive environment. The results are inefficient systems that provide little or no benefit to their companies.

There is a variety of strategic planning frameworks written in many books. However, still so many owners or managers of these small business have neither time nor opportunity to understand and evaluate many of the proposed frameworks that have been conducted to help identify strategic opportunities for information systems. Therefore, the development of a decision support tool that can help them to understand how these frameworks or analysis tools can be best used for their particular competitive environment is necessary.

The objective of this research is therefore to design an executive support system (ESS) to guide the owners of small enterprise in developing a strategic plan for using information systems in their business.

The designed ESS will provide the analysis of the three important perspectives of a competitive role for information systems in the business: the business environment, the enterprise environment, and the use of information systems. The specific details in each one can be summarized as follows:

The business environment

- Analysis of the external environment (Competitive five forces, PEST analysis)
- Analysis of pressure groups and stakeholders (customer, competitors, stakeholders)

The company environment

- Analysis of the internal environment of the company (SWOT analysis)
- Development of the business vision, objectives/goals, and strategies.

The use of information systems

- Analysis of the critical success factors (CFSs) for business success.
- The use of frameworks such as strategic thrusts and strategic option generator for strategic information systems opportunities.
- Identification of possible information system strategy.
- Suggestion of criteria for strategy selection.

2. The Content of the ESS

The content of the ESS can be categorized into 4 major steps in developing SIS as follows:

3. The Finished Software

Based on the model shown in chapter 3 and the requirements from the users discussed in the previous section, the ESS is developed by using the Microsoft Frontpage software 2000. It is presented in the form of web pages and can be viewed on the web browser such as Microsoft Internet Explorer version 5.5 or higher. It contains approximately 21 screens of content, including frameworks, models, tables, and information needed in understanding and developing strategic information systems. Users can use this ESS either off or on line (some processes though need web server or personal web server to be done). The examples of some screens in the ESS are displayed in figure A-1 below.

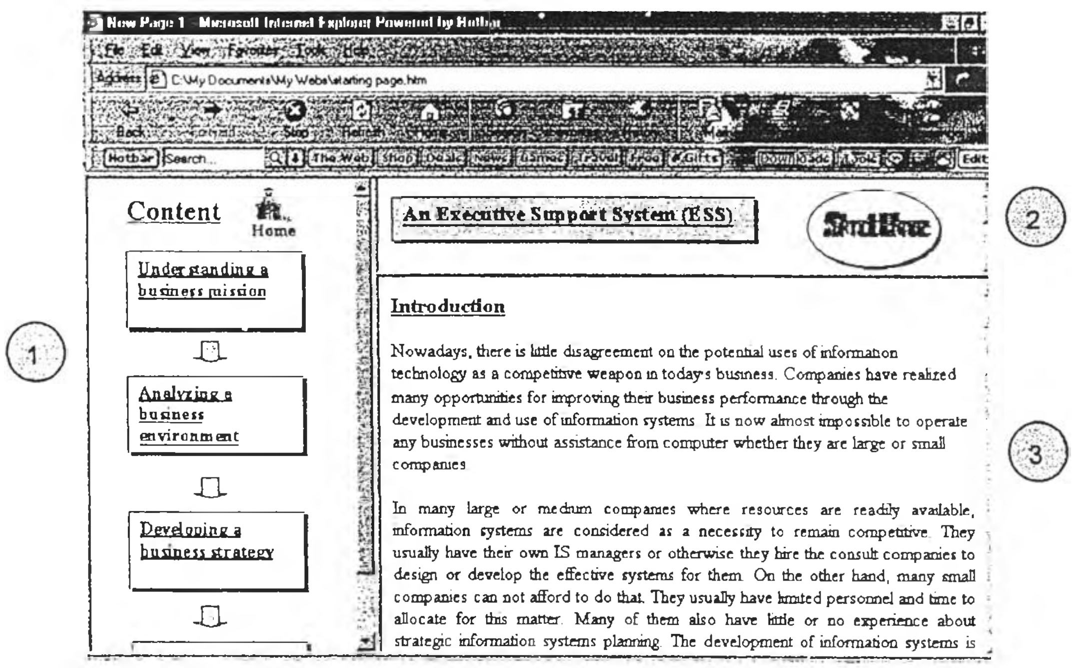


Figure A-1 The Example Screen of the ESS

The ESS begins with the introduction of the designed model content, the needs for IS to support and create competitive advantage for the business, and the guideline to use the ESS. The content of the ESS includes 4 important sections of developing SIS: understanding a business mission, analyzing a business environment, developing a business strategy and identifying IS strategy.

4. The Components of the ESS

From figure A-1, the ESS is presented including the following components:

1) Content

The content includes the major 4 steps in developing strategic information systems: understanding a business mission, analyzing a business environment, developing a business strategy and identifying IS strategy. Users can move to these screens by simply clicking each label (some screens though are not included in this content but can be reached by clicking forward arrow or backward arrow shown in header section).

2) Header

The header shows the current screen's name and forward and backward arrow for moving to the next or previous screen.

3) Context

The screen's context features pictures, tables, frameworks, and models needed in developing strategic information systems, including explanations embedded in these figures. By simply clicking these figures, an explanation will be demonstrated in the left frame by replacing the content screen.

5. How to use this ESS

At the first time, users should develop a preliminary understanding about the overall content of this model and how it works before using it. After that, by clicking the start here button, users can begin to develop their own strategic information systems. It is strongly recommended that users should follow the development path screen by screen.

- **Screen 1: The Opening Page of the ESS (Figure A-2)**

Screen 1 is an opening page. Users can enter this program by simply clicking at the "Enter Here" icon.

- **Screen 2: The Starting Page of the ESS (Figure A-3)**

Screen 2 is a starting page. It includes the brief introduction, the conceptual model, and the components of the ESS. When uses understand the overall concept of this program, they can log in by clicking the "Start Here" icon and entering the password for each user's account.

- **Screen 3: Understanding a business mission (Figure A-4)**

The content of screen 3 is to understand a business mission. In this screen, three major components of a business mission: business definition, vision and goals, and philosophies are discussed. Users can view the meaning of each one by clicking at its icon. It is recommended that users should start developing an understanding of a business mission first and then try to understand its three components later. There are 2 languages: Thai and English to select.

- **Screen 4: Understanding an influence of the shareholders (Figure A-5)**

The concept of screen 4 is to realize an influence of the shareholders. Users can view the importance of shareholder expectations by clicking at its icon. Users can also view how influential the shareholder is by clicking at the picture of shareholder position. An explanation will appear at the left frame of this screen.

- **Screen 5: Writing a business mission (Figure A-6)**

After users understand what a business mission is and realize the importance of the shareholder influence, the next step is to write a business mission statement. In this screen, there are some selected questions for users to answer. Users should begin answering from the first to the last question. The answer of each question will provide a rough idea to write a business mission statement in the following screen.

- **Screen 6: Writing a business mission (continue) (Figure A-7)**

In screen 6, users have to write a business mission statement, which includes business definition, vision, goals, and philosophies. This mission statement will be used as a guideline throughout the strategic information systems development. The answers of questions from the previous screen questions will provide a rough idea for owners/managers to identify the definition of their business regarding three dimensions discussed in Abell's model. The first drafted statement may be as long as one page. But after keep refining and polishing, the final drafted statement should be comprehensive and read fluently, may be one or two long, complicated sentences, extending to perhaps half a page. Then later on, a vision or strategic direction, and philosophies can be extracted from this statement.

- **Screen 7: Analyzing a business environment (Figure A-8)**

After a business mission statement is established, the next stage is to analyze the business environment in order to develop a business strategy. There are three levels of business environment to be discussed in this screen: macroenvironment, industry environment, and organization. Users can view the description of each one by clicking at its icon.

- **Screen 8: Macroenvironment (PEST analysis) (Figure A-9)**

The first environment level to be analyzed is the macroenvironment. PEST analysis is used to analyze 4 crucial factors: political, economic, social, and technology. Users can view the meaning of each one by clicking at its icon.

- **Screen 9: Macroenvironment (PEST analysis continue) (Figure A-10)**

In this screen, users are asked to write down issues deemed important in each area of PEST analysis. These issues will be used again in later stage. Users can also view examples of important issues in each area of PEST analysis by clicking at its icon for both Thai and English.

♦ **Screen 10: Industry environment (Five Forces analysis) (Figure A-11)**

Industry environment, the second level, is discussed in this screen. Porter's competitive five-force is the analysis tool used to analyze five forces that shape the competition in the industry. Users can view the explanation and examples of each force by clicking at its icon.

♦ **Screen 11: Industry environment (Five Forces analysis continue) (Figure A-12)**

In this screen, users are asked to write down issues deemed important in each area of Five Forces analysis. User can view questions and issues provided to help generate ideas by clicking at icon of each force. These issues will be used again in later stage.

♦ **Screen 12: Internal analysis (SWOT analysis) (Figure A-13)**

This screen includes the analysis at the organization level, the internal analysis. SWOT analysis is used to discuss 4 areas: strengths, weaknesses, opportunities, and treats. Users can view the description of each one by clicking at its icon.

♦ **Screen 13: Internal analysis (SWOT analysis continue) (Figure A-14)**

After users develop an understanding of SWOT analysis, users are now asked to write down the issues relating to each area. Issues involving opportunities and threats can be derived directly from PEST and Five Forces analysis. For strengths and weaknesses, users can derive from investigating the company capabilities and resources. There are also examples of important areas needed to consider embedded in both icons of external and internal environment.

♦ **Screen 14: Prioritizing external factors (Figure A-15)**

After the SWOT table is completed. Users can prioritize these issues by weighting and rating each issue and then summing up the total scores. The result will be the list of prioritized issues. This screen is for external factors, which are opportunities and threats. Users can view steps in prioritizing external factors by clicking its icon.

- **Screen 15: Prioritizing internal factors (Figure A-16)**

Like screen 14, this screen is for prioritizing internal factors: strengths and weaknesses. Steps in prioritizing are similar to those in the screen 14.

- **Screen 16: Generating strategies using TOWS matrix (Figure A-17)**

The next step is to generate a business strategy. TOWS matrix is used in this screen. The prioritized factors in SWOT analysis will be used in this matrix. SO, ST, WO, and WT strategies will be developed in this screen based on SWOT factors. Steps in creating TOWS matrix can be viewed by clicking at its icon.

- **Screen 17: Evaluating strategies (Figure A-18)**

After the SO, ST, WO, and WT strategies are identified, the next step is to evaluate these strategies to prioritize the importance of each one. A QSPM is used to do that. The process in evaluating is quite similar to those of screen 14 and 15. Each strategy will be weighted against each factor in SWOT analysis. The total scores will indicate which strategy is the most important. Steps in developing a QSPM can be viewed by clicking at its icon.

- **Screen 18: Identifying critical success factors (Figure A-19)**

Screen 18 involves the identification of critical success factors and key performance indicators against each business strategy. Each strategy must have at least one critical success factor and key performance indicator. Steps in conducting CSFs analysis can be viewed by clicking at its icon.

- **Screen 19: Identifying possible IS applications (Figure A-20)**

In this screen, the strategic option generator is used to identify possible IS applications based on the CSFs identified from the previous screen. The strategic option generator consists of three strategic targets: customers, suppliers, and competitors and five strategic thrusts: differentiation, cost, innovation, growth, and alliance. Steps in using the strategic option generator begin with identifying the business and continue through the selection of strategic thrusts, mode, and direction. The results of several analyses from the beginning plus key information requirements derived from the CSF analysis should provide adequate information needed to help identifying the potential strategic IS opportunities by using this model.

♦ **Screen 20: Making the application portfolio (Figure A-21)**

After the possible IS applications are determined, the next step is to create the application portfolio. There are 4 quadrants to be filled in: strategic, high potential, key operational, and support. Users have to select each IS application and write down into each quadrant based on its business contribution. Explanations and examples to help generate ideas can also be viewed by clicking at each icon of these 4 quadrants.

♦ **Screen 21: Managing the application portfolio (Figure A-22)**

Screen 21 describes how to manage IS applications in each quadrant in the application portfolio. Users can view the explanation of each one by clicking at its icon.

6. <u>Mechanism of the ESS</u>

The mechanism of the ESS mostly emphasizes on embedding the explanation of important meanings or instructions in pictures, tables, or icons each stage of the systems. There are also automatic links to transfer information from one stage to another for the convenience of users (screen 14-17). The identified opportunities, threats, strengths, and weaknesses in screen 13 will automatically appear on prioritizing tables for both internal and external factors, TOWS matrix, and a QSPM in screen 14, 15, 16, and 17 respectively.

A built-in calculator is also included in the ESS to facilitate users in every stage involving calculations such as rating or evaluating strategies in screen 14, 15, and 17. Users can save or delete work progress by clicking submit or reset button. Users can also use the ESS with ICQ, MSN or other messenger software to set up Internet meeting for brainstorming or exchange of ideas and information.

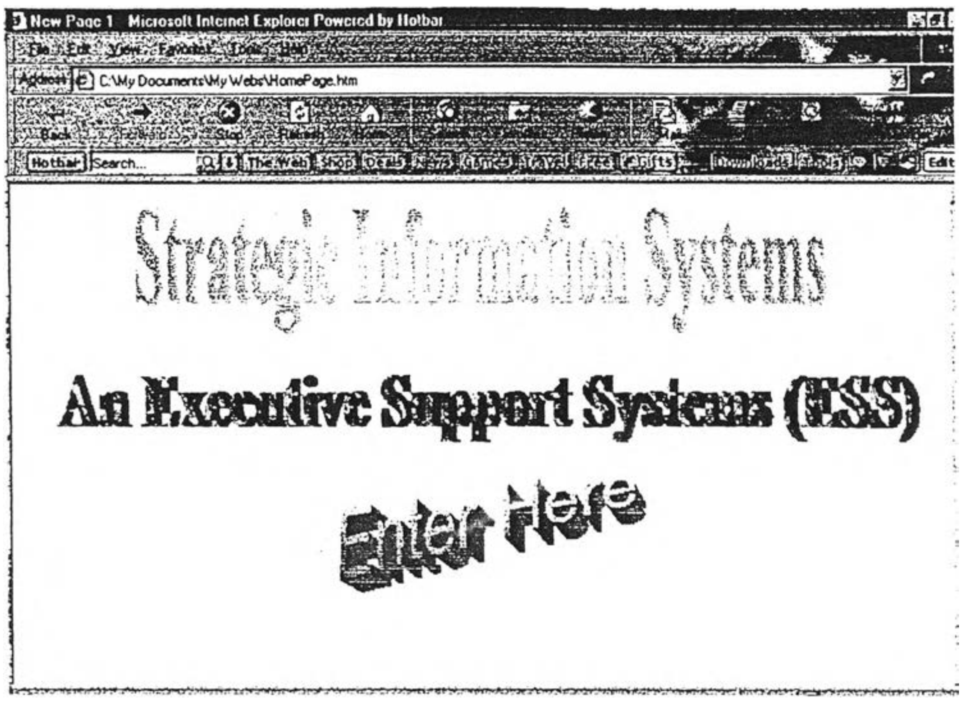


Figure A-2 Screen 1: The Opening Page of the ESS

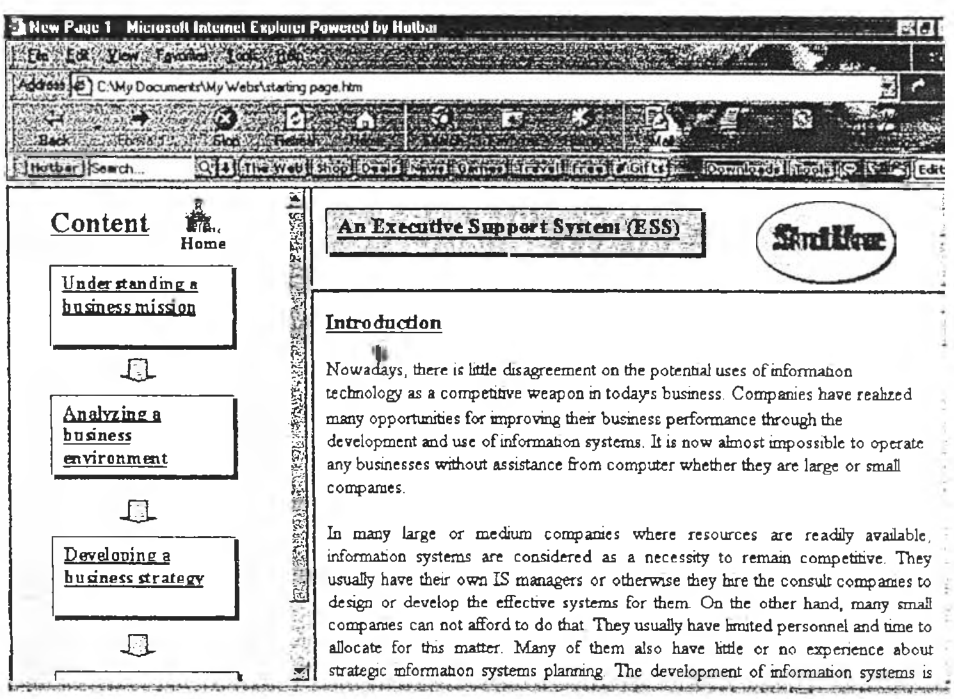


Figure A-3 Screen 2: The Starting Page of the ESS

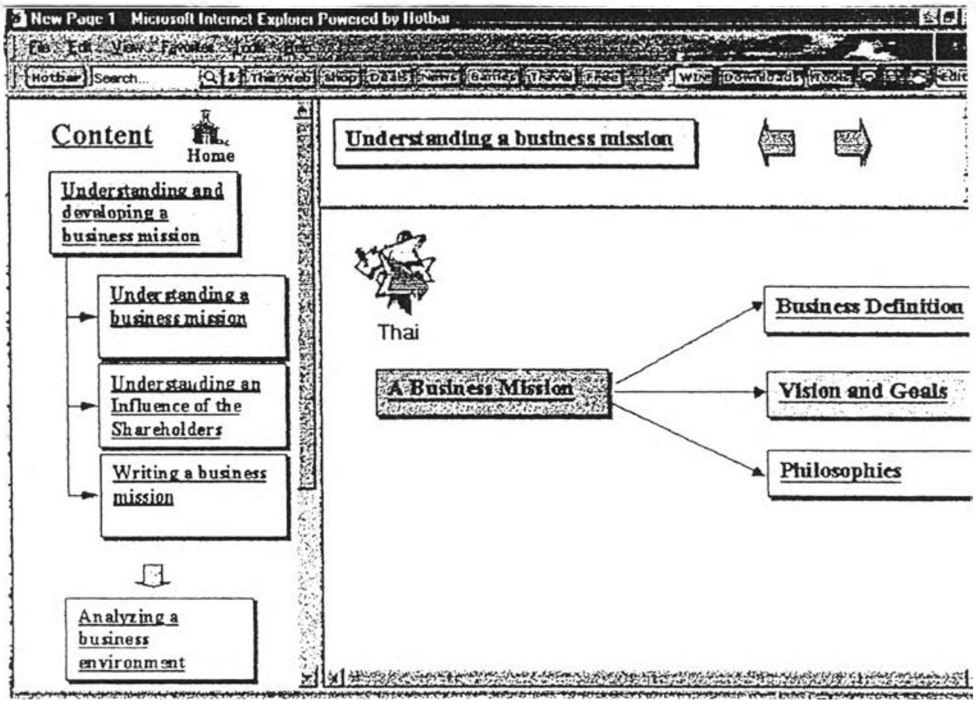


Figure A-4 Screen 3: Understanding a business mission

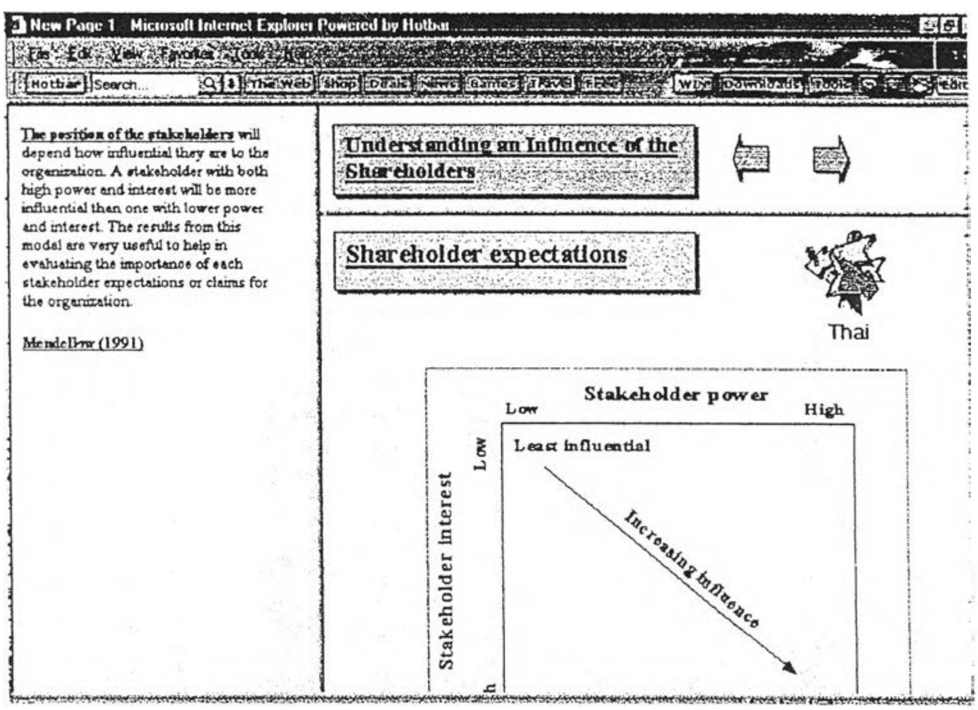


Figure A-5 Screen 4: Understanding an influence of the shareholders

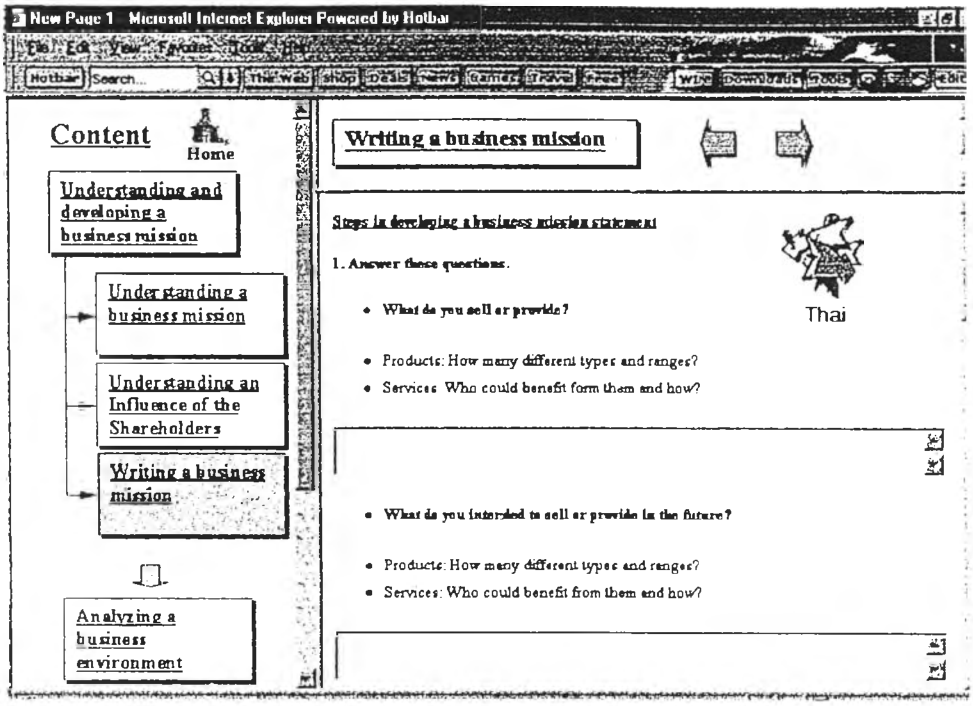


Figure A-6 Screen 5: Writing a business mission

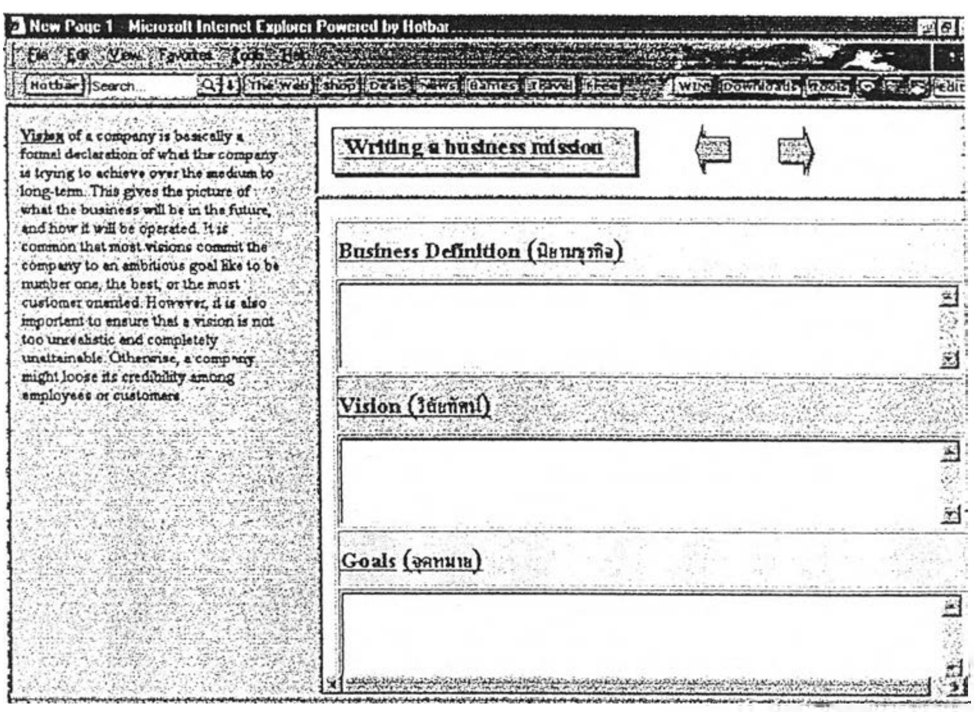


Figure A-7 Screen 6: Writing a business mission (continue)

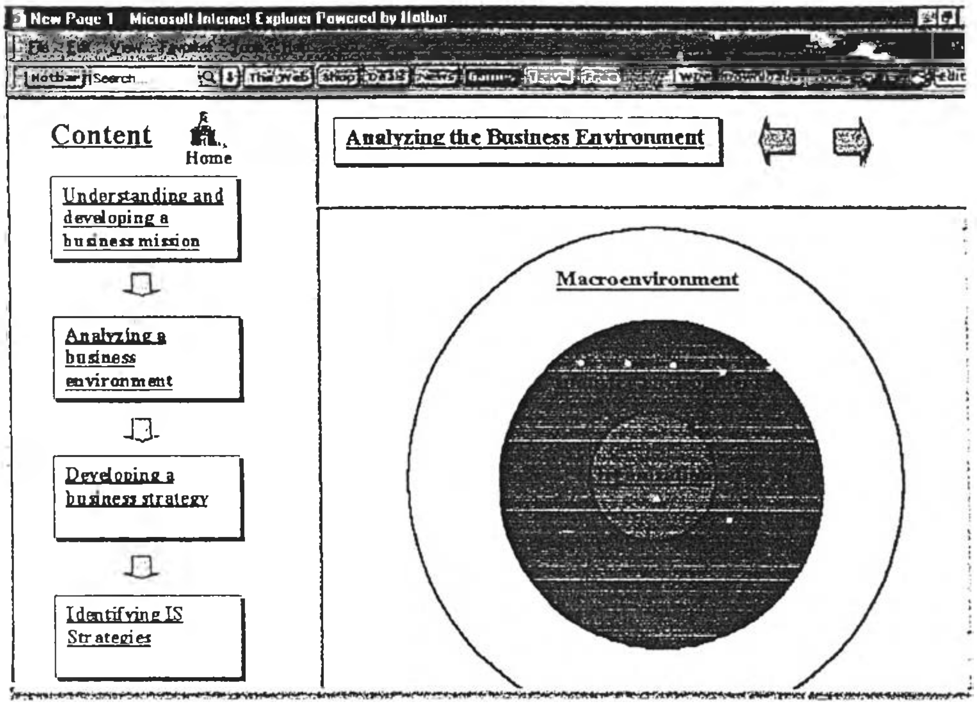


Figure A-8 Screen 7: Analyzing a business environment

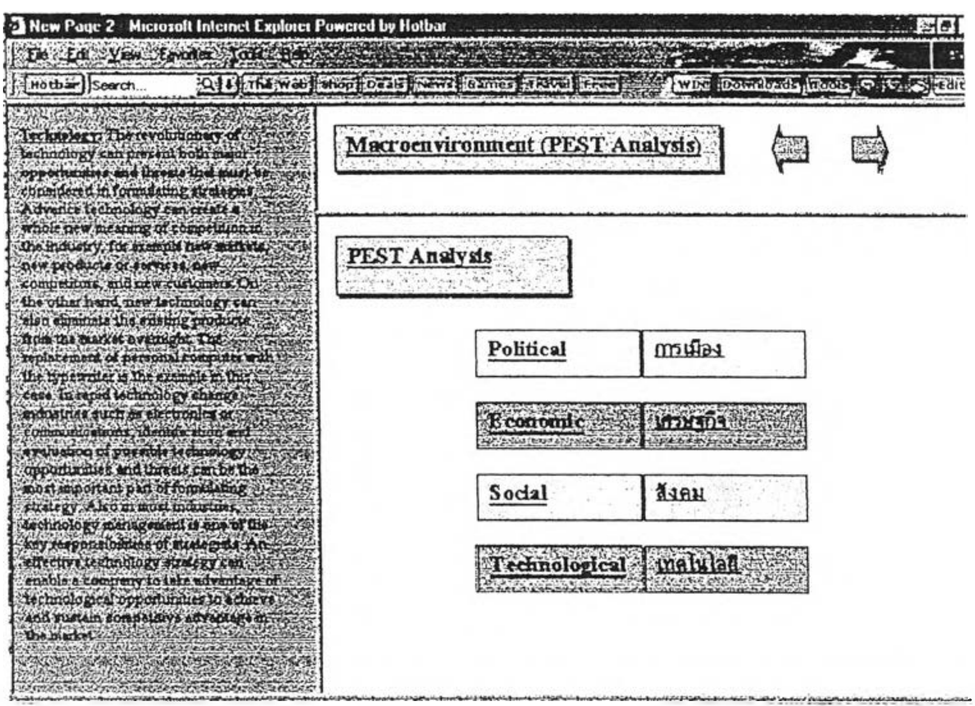


Figure A-9 Screen 8: Macroenvironment (PEST analysis)

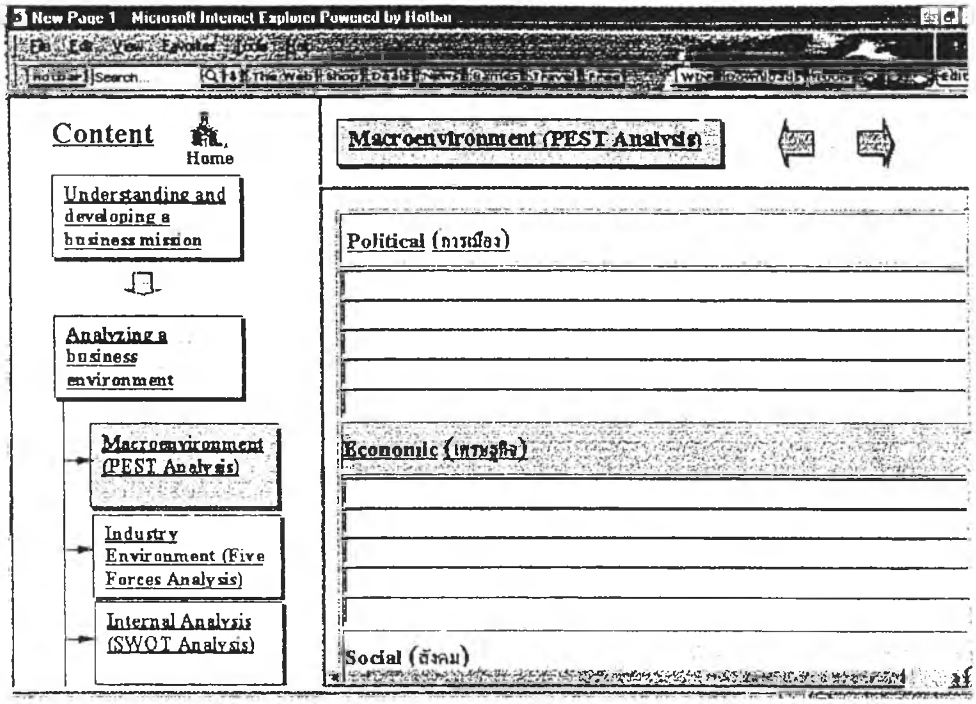


Figure A-10 Screen 9: Macroenvironment (PEST analysis continue)

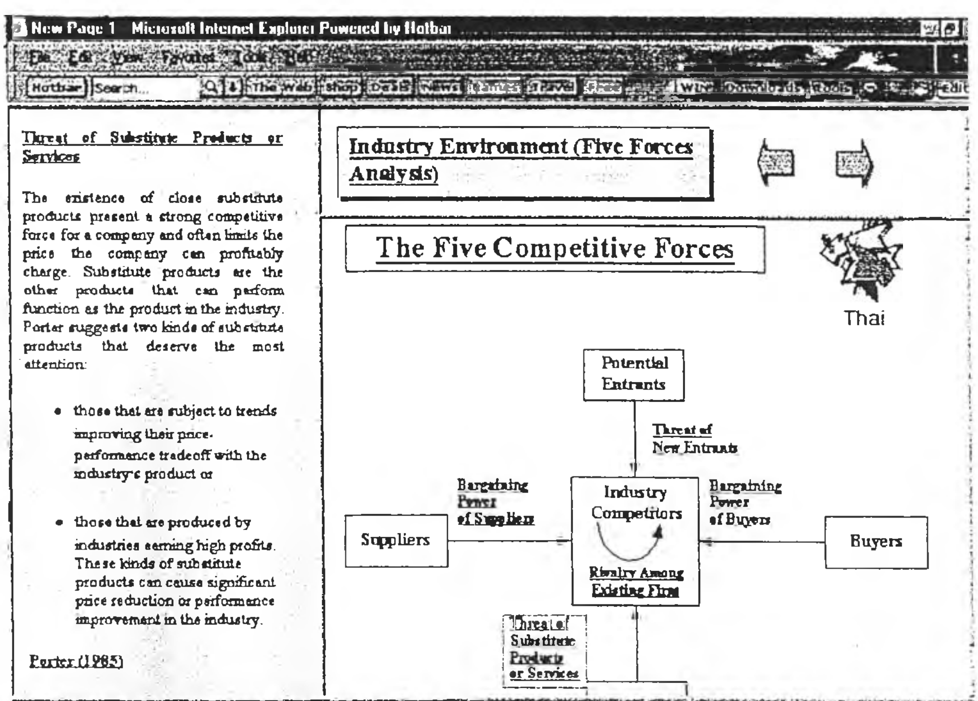


Figure A-11 Screen 10: Industry environment (Five Forces analysis)

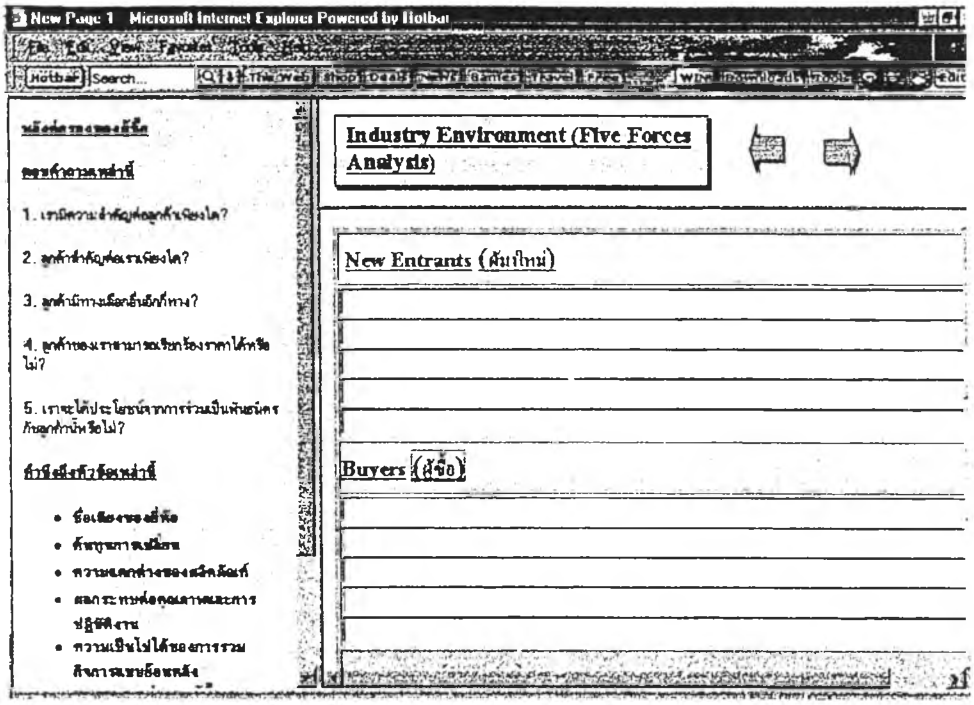


Figure A-12 Screen 11: Industry environment (Five Forces analysis continue)

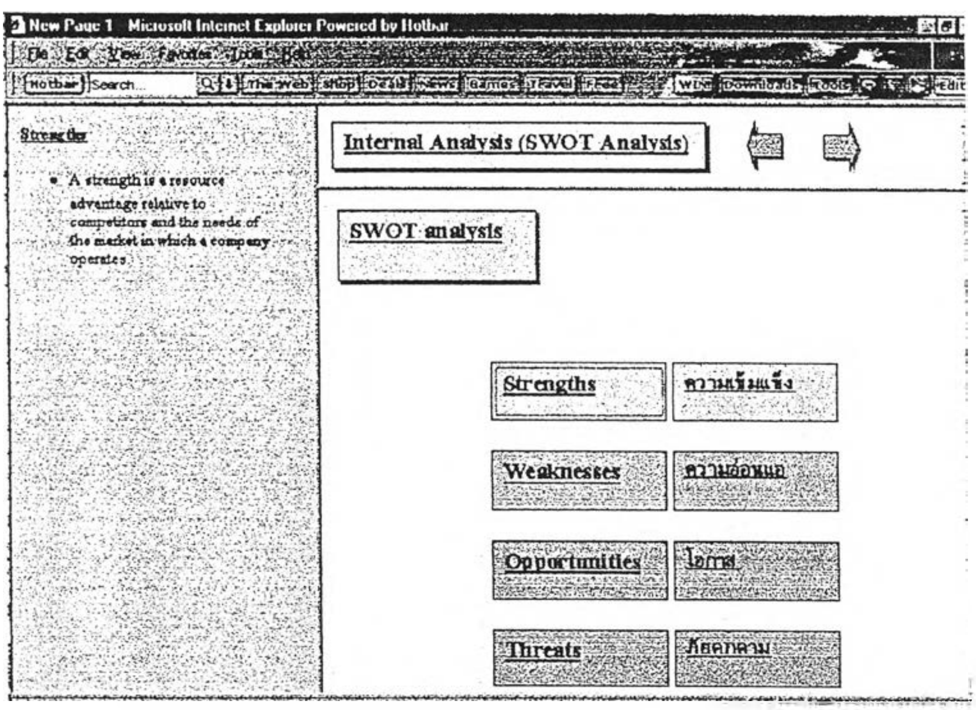


Figure A-13 Screen 12: Internal analysis (SWOT analysis)

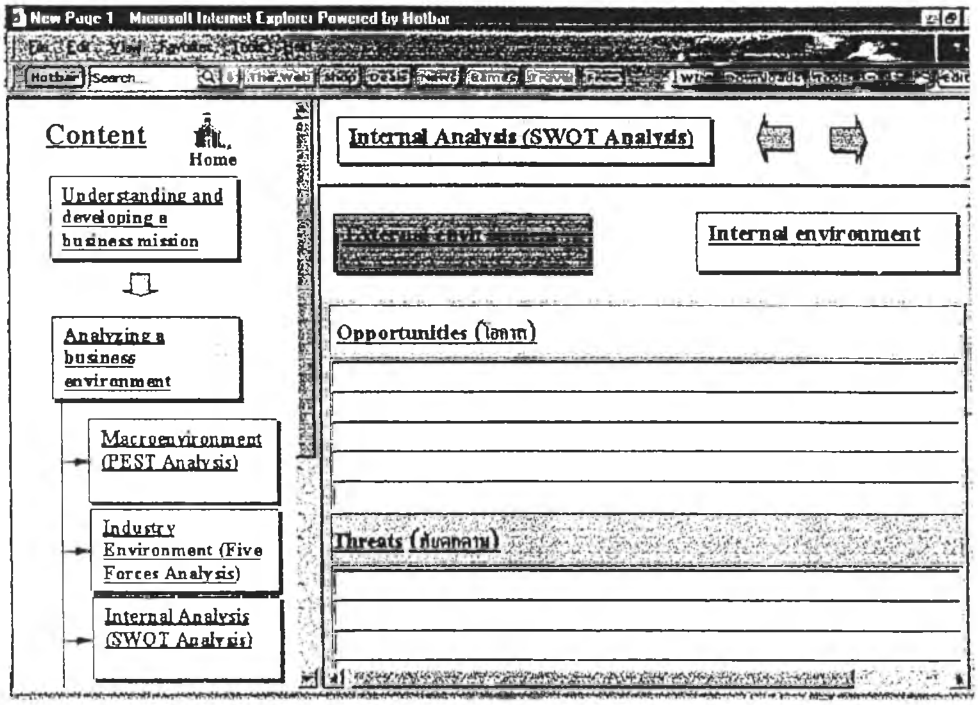


Figure A-14 Screen 13: Internal analysis (SWOT analysis continue)

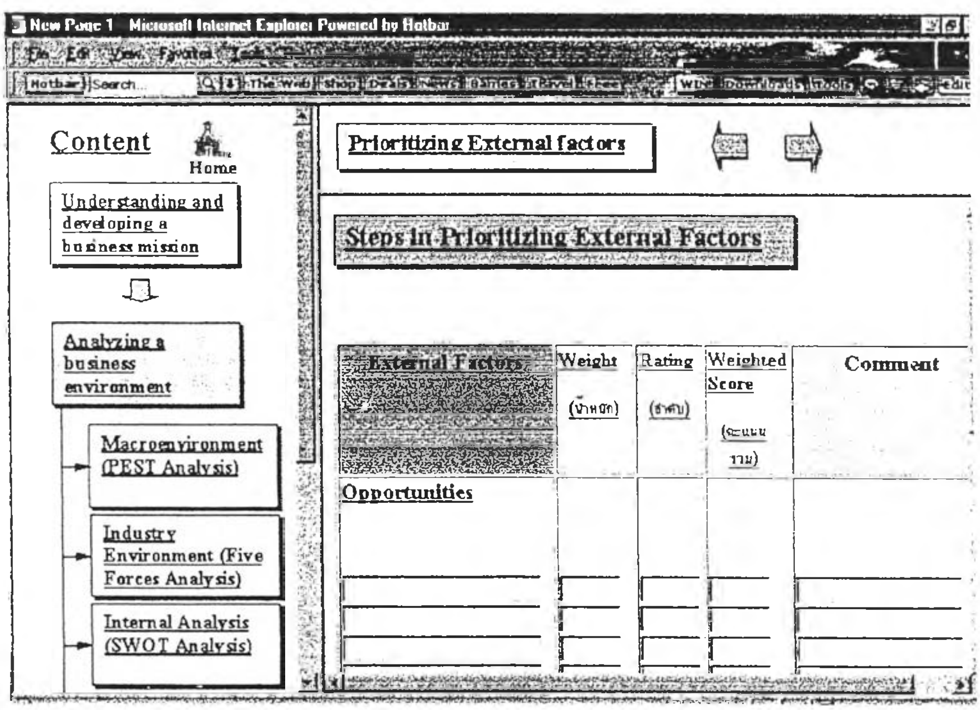


Figure A-15 Screen 14: Prioritizing external factors

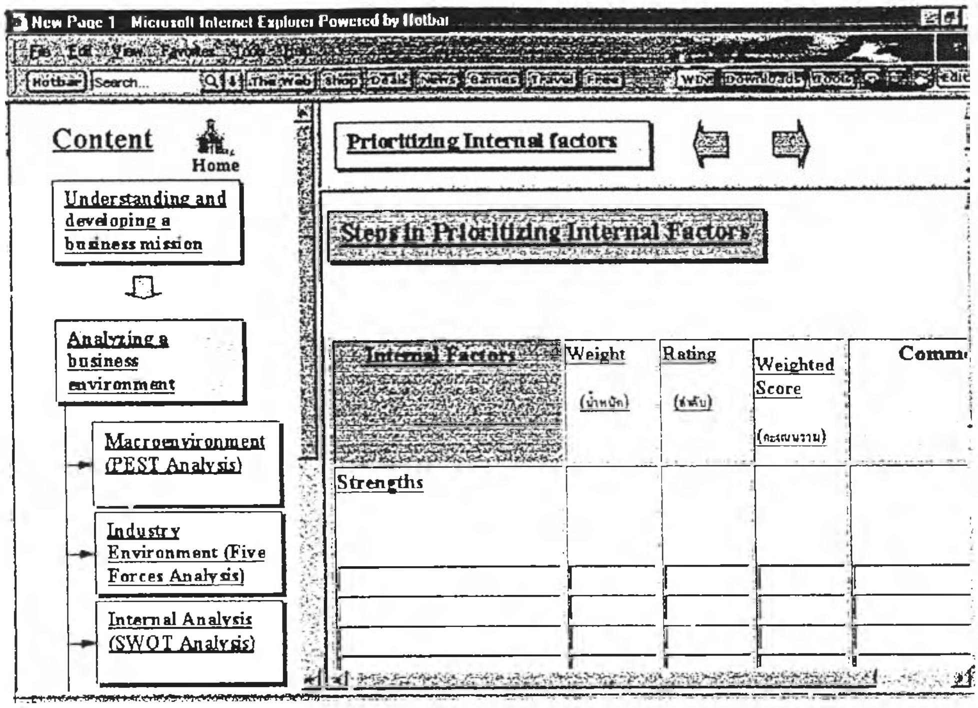


Figure A-16 Screen 15: Prioritizing internal factors

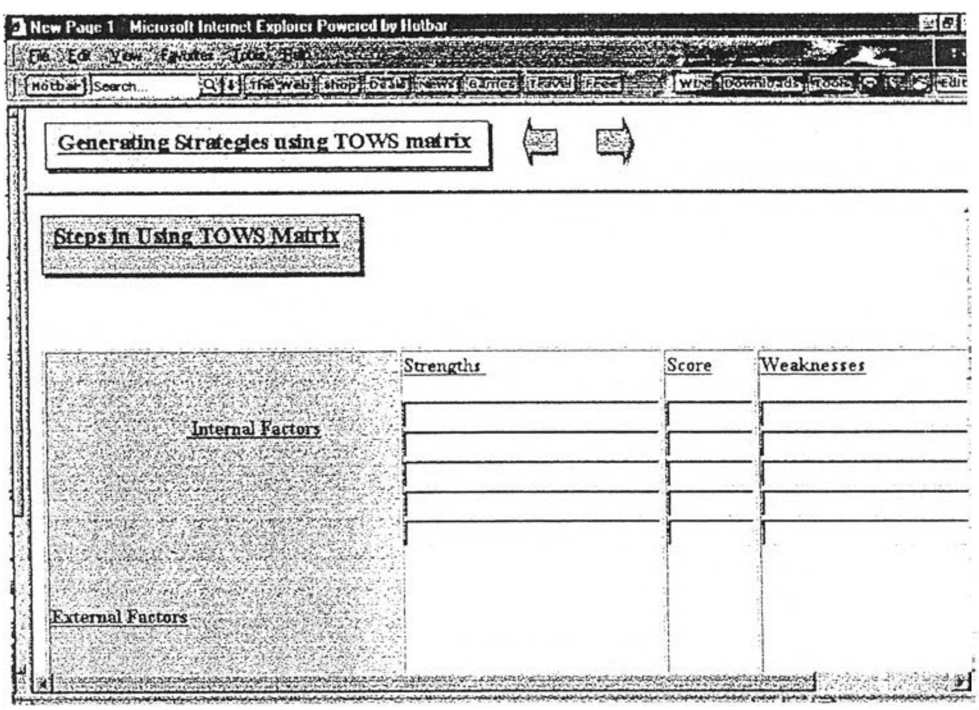


Figure A-17 Screen 16: Generating strategies using TOWS matrix

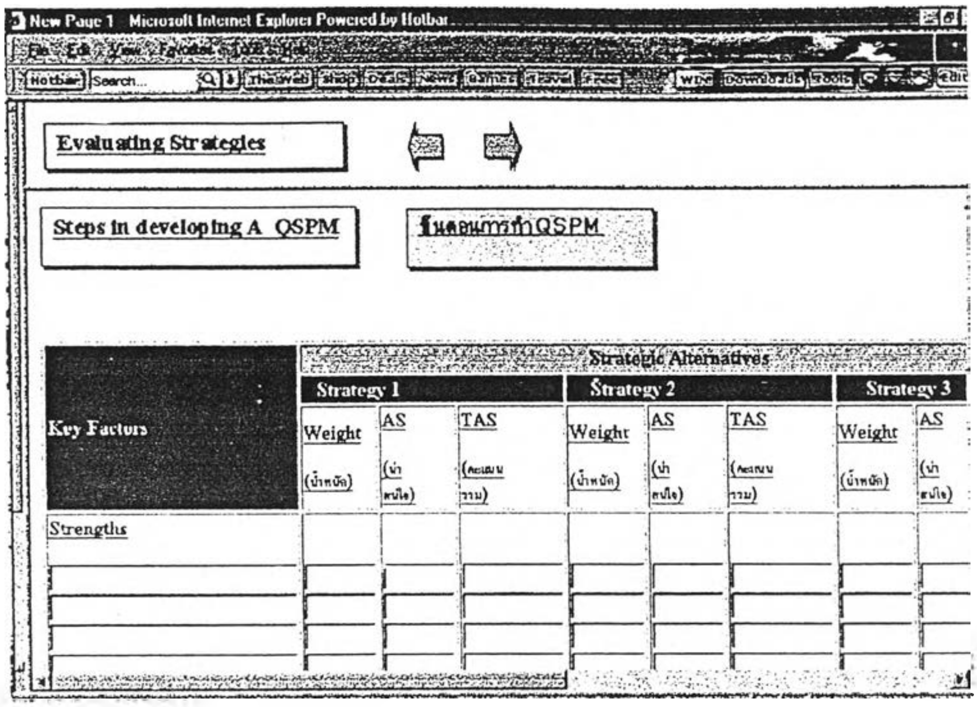


Figure A-18 Screen 17: Evaluating strategies

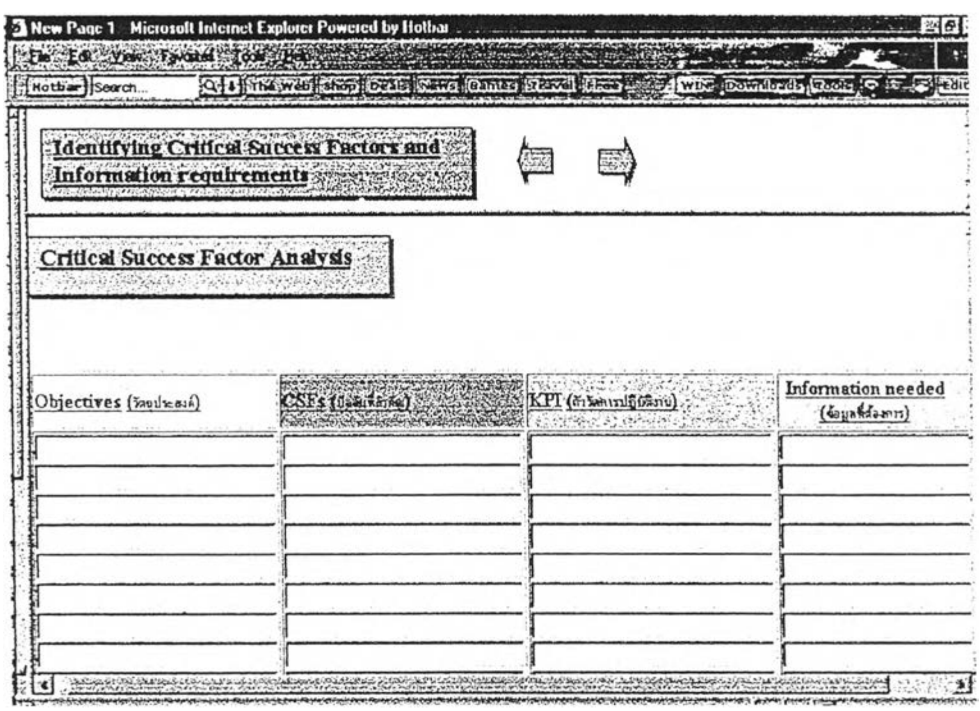


Figure A-19 I Screen 18: Identifying critical success factors

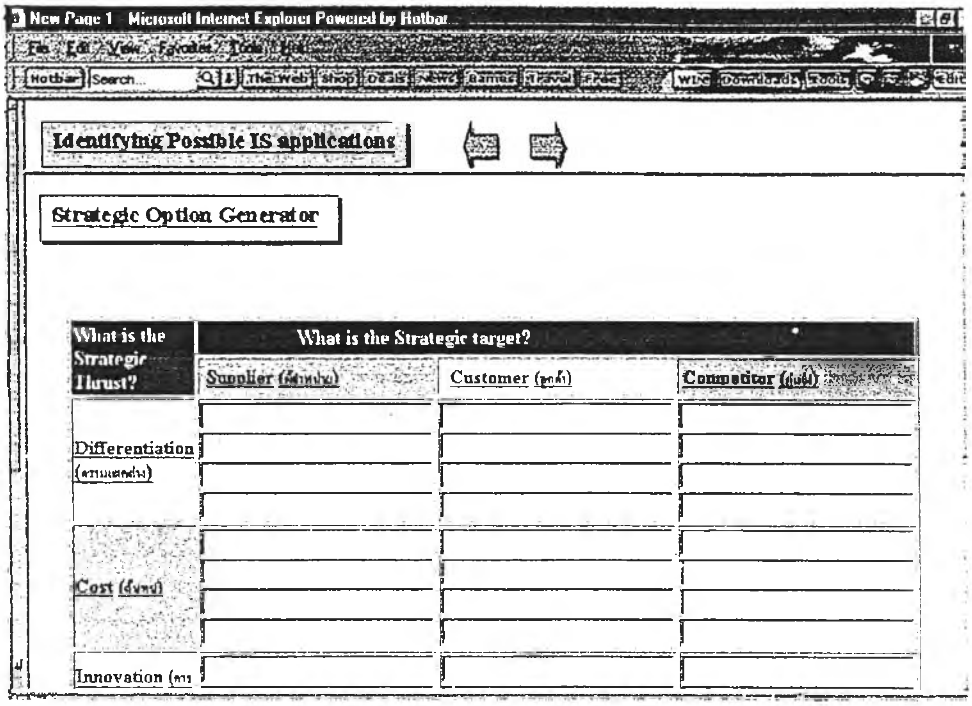


Figure A-20 Screen 19: Identifying possible IS applications

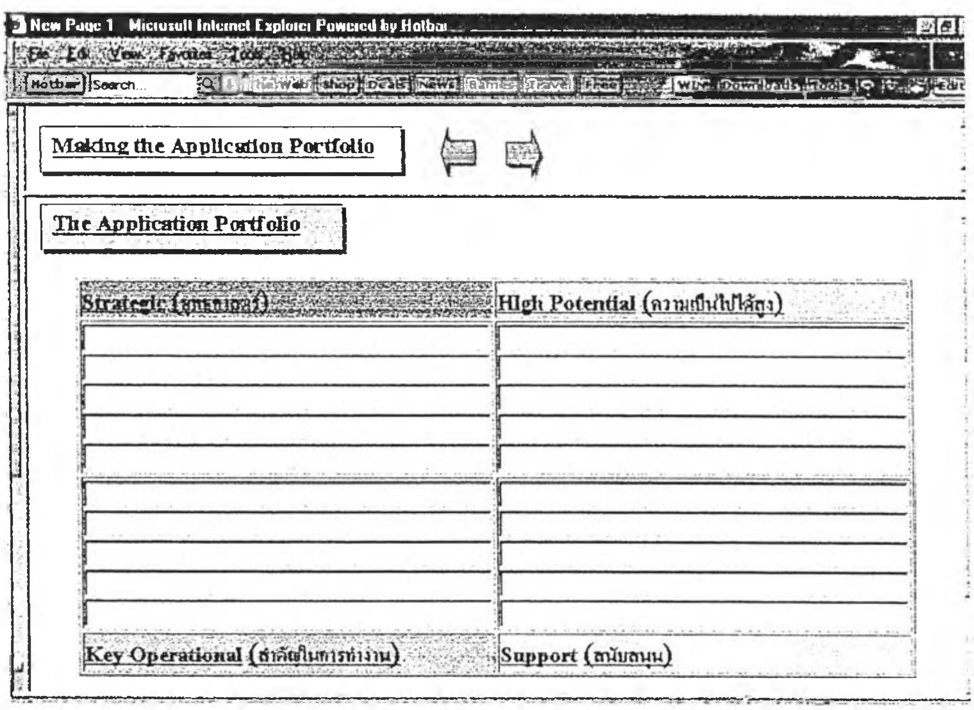


Figure A-21 Screen 20: Making the application portfolio

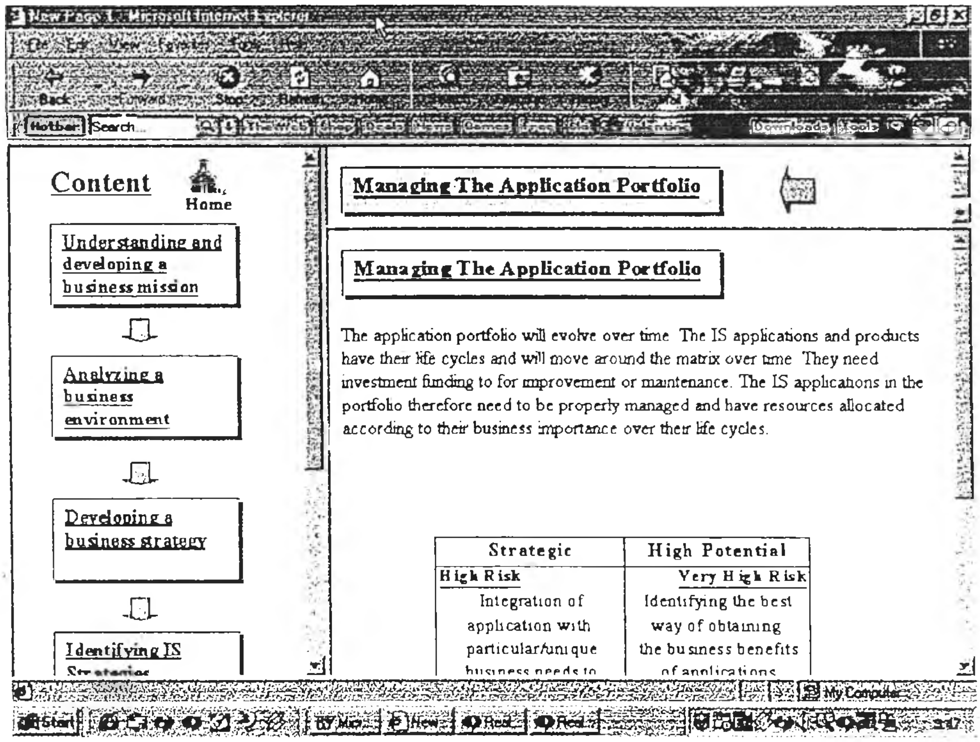


Figure A-22 Screen 21: Managing the application portfolio

APPENDIX B

THE QUESTIONNAIRE

APPENDIX B
THE QUESTIONNAIRE

The following information is given as brief introduction to information systems, strategic information systems, and strategic information systems planning to the subject before filling in the questionnaire.

Information Systems (IS)

According to Andreu et al (1992), Information Systems (IS) is understood as:

" The formal group of processes that, operating on a collection of data structured according to the needs of a company, complies, elaborates and distributes part of the information necessary for the operation of the company, and for the related management and control activities, supporting, in part, the decision-making processes necessary to carry out the business functions of the company. "

Strategic Information Systems (SIS)

Strategic Information Systems (SIS) are characterized by its ability to support or shaped the firm's competitive strategy. SIS does this through its contribution to the strategic goals of the company and/or its ability to increase performance, productivity, and effectiveness significantly.

Strategic Information Systems Planning (SISP)

Remenyi (1991) identifies that a SISP is a process of establishing a program for implementation and use of IS in such a manner that it will optimize the firm's information resources and use them to support the objectives of the whole corporate as much as possible.

The concept of SISP has been evolving over the last decade. People have realized that only the hardware and software requirements approach to IS planning was not enough for the company. In fact, SISP involves matching the IS applications with the objectives of organizations. Earl (1993) summarizes that SISP includes the following areas:

- Aligning investment in IS with business goals.
- Exploiting IS for competitive advantage.
- Directing efficient and effective management of IS resources.
- Developing technology policies and architectures.

The first two areas involve with information systems strategy whereas the third and fourth are concerned with information management strategy and information technology strategy respectively.

Questionnaire

The following questionnaire is developed by the author of this thesis. The intent of the study is to evaluate the user's satisfaction of using the software designed specifically to help developing strategic information systems. The questionnaire will take only 5 to 10 minutes to fill out at your convenience. Your name and personal information will in no way be connected with the questionnaire. Your answer will be used for evaluation purpose only and will be held in the strictest confidence.

1. How long have you completed all the steps in this software?
   - ◯ 1 day
   - ◯ 1 or 2 weeks
   - ◯ more than 2 weeks

2. Do you need any assistence while using this software?
   - ◯ Yes
   - ◯ No

   if yes, what kind of assistences are you needed? (more than one choice can be selected)
   - ◯ Using instructions
   - ◯ Overall concept of this software
   - ◯ The meanings of each steps
   - ◯ Examples of how to complete in each step
   - ◯ Advice from strategist

3. Comparing to your previous strategy development, if any, do you think that using this software helps you organize your thinking more systematically?
   - ◯ Yes, very much
   - ◯ Yes, but only when I had used it for a while
   - ◯ Yes, but only when I had my strategist helping me
   - ◯ Not at all

4. After using this software, please rate the following items that you experience.

	5	4	3	2	1
Ease of use	◯	◯	◯	◯	◯
Understandability of operating instructions	◯	◯	◯	◯	◯
Sufficiency of Information provided	◯	◯	◯	◯	◯
Arrangement of order of context	◯	◯	◯	◯	◯
Usefulness in terms of decision support syste	◯	◯	◯	◯	◯
Style of presentation	◯	◯	◯	◯	◯
Ability to help understanding of strategic information system development	◯	◯	◯	◯	◯

Note: 5 = Excellent, 4 = Good, 3 = Average, 2 = Fair, 1 = Poor

5. Comparing to your previous knowledge, did you think that your knowledge about strategic information systems improved after using it?
   - ◯ Significantly improved
   - ◯ Slightly improved
   - ◯ About the same
   - ◯ Not at all

6. After using this software, do you think it meets your requirements?
   - ◯ Fully met
   - ◯ Partially met
   - ◯ Not at all

7. Considering the usefulness to strategic information system development, how satisfied or dissatisfied are you with this software?
   - ◯ Completely satisfied
   - ◯ Mostly satisfied
   - ◯ Neither satisfied or dissatisfied
   - ◯ Mostly dissatisfied
   - ◯ Completely dissatisfied

8. What changes/improvements would you like to see in this software?

____
____
____
____
____
____

9. Finally, what is your overall comment of this software?

____
____
____
____
____
____

The following questions are about personal information.

10. What is your highest level of education you have completed?

- ◯ No formal education
- ◯ Some grade school
- ◯ Completed grade school
- ◯ Some high school
- ◯ Completed high school
- ◯ Some college
- ◯ Completed college
- ◯ Some graduate work
- ◯ A graduate degree

11. What is your present occupation?

- ◯ Business and professional
- ◯ Salaried and semiprofessional
- ◯ Skilled worker
- ◯ Laborer
- ◯ Student

12. Do you have your own business?

- ◯ Yes
- ◯ No

if yes, how important Information is to your business?

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

13. Have you considered using information systems in your business or your organization?

- ◯ Yes
- ◯ No
- ◯ Yes, but not knowing where to start

14. Have you ever involved with formulating any Information System strategy before?

- ◯ Yes
- ◯ No

if yes, how did you do that? (more than one choice can be selected)

- ◯ hire consultant
- ◯ did by yourself through reading books relating to strategy development
- ◯ did by teamwork
- ◯ did by yourself without prior knowledge about strategic development

15. Are you satisfied with your existing Information System strategies, if any ?
- ○ Yes
- ○ No

if not, what are you dissatisfied with about your existing Information System strategies? (more than one choice can be selected)
- ○ They not properly serves your business objectives
- ○ They are not suitable to your existing business environment
- ○ They are not suitable to current technological environment
- ○ They are not capable of creating competitive advantage to your business

16. Before using this software, please select the following items that you familiar. (more than one choice can be selected)
- ○ PEST analysis
- ○ SWOT analysis
- ○ Industry analysis (Competitive five forces)
- ○ TOWS matrix
- ○ Critical Success Factors analysis
- ○ Strategic Option Generator
- ○ The Application Portfolio

17. Have you ever used any of these analysis tools shown in question 7 before?
- ○ Yes
- ○ Yes, but still not quite understand
- ○ No

18. Have you ever used a software specifically designed for strategic information system development before?
- ○ Yes
- ○ No

Thank you very much for your assistance.

Questionnaire Results

The following information is derived from the questionnaire sent to user 1 and 2 in the subject case company, the sales manager and the marketing manager, respectively. This result is shown only the first part of the questionnaire that relates to the use of this software. The interpretation of the full questionnaire can be viewed in chapter 3 at the questionnaire results section.

Interviewer no. __1__

1. How long have you completed all the steps in this software?
   - ○ 1 day
   - ○ 1 or 2 weeks
   - ○ more than 2 weeks

2. Do you need any assistence while using this software?
   - ○ Yes
   - ○ No

   if yes, what kind of assistences are you needed? (more than one choice can be selected)
   - ○ Using instructions
   - ○ Overall concept of this software
   - ○ The meanings of each steps
   - ○ Examples of how to complete in each step
   - ○ Advice from strategist

3. Comparing to your previous strategy development, if any, do you think that using this software helps you organize your thinking more systematically?
   - ○ Yes, very much
   - ○ Yes, but only when I had used it for a while
   - ○ Yes, but only when I had my strategist helping me
   - ○ Not at all

4. After using this software, please rate the following items that you experience.

	5	4	3	2	1
Ease of use	○	○	○	○	○
Understandability of operating instructions	○	○	○	○	○
Sufficiency of Information provided	○	○	○	○	○
Arrangement of order of context	○	○	○	○	○
Usefulness in terms of decision support system	○	○	○	○	○
Style of presentation	○	○	○	○	○
Ability to help understanding of strategic information system development	○	○	○	○	○

Note: 5 = Excellent, 4 = Good, 3 = Average, 2 = Fair, 1 = Poor

5. Comparing to your previous knowledge, did you think that your knowledge about strategic information systems improved after using it?
   - ◯ Significantly improved
   - ◯ Slightly improved
   - ◯ About the same
   - ◯ Not at all

6. After using this software, do you think it meets your requirements?
   - ◯ Fully met
   - ◯ Partially met
   - ◯ Not at all

7. Considering the usefulness to strategic information system development, how satisfied or dissatisfied are you with this software?
   - ◯ Completely satisfied
   - ◯ Mostly satisfied
   - ◯ Neither satisfied or dissatisfied
   - ◯ Mostly dissatisfied
   - ◯ Completely dissatisfied

8. What changes/improvements would you like to see in this software?

more simple arrangement of content.
need sources for information support.

9. Finally, what is your overall comment of this software?

should have some options or helping choices for decision-making.

Questionnaire Results

Interviewer no. __2__

1. How long have you completed all the steps in this software?
   - ○ 1 day
   - ○ 1 or 2 weeks
   - ○ more than 2 weeks

2. Do you need any assistance while using this software?
   - ○ Yes
   - ○ No

   if yes, what kind of assistance's are you needed? (more than one choice can be selected)
   - ○ Using instructions
   - ○ Overall concept of this software
   - ○ The meanings of each steps
   - ○ Examples of how to complete in each step
   - ○ Advice from strategist

3. Comparing to your previous strategy development, if any, do you think that using this software helps you organize your thinking more systematically?
   - ○ Yes, very much
   - ○ Yes, but only when I had used it for a while
   - ○ Yes, but only when I had my strategist helping me
   - ○ Not at all

4. After using this software, please rate the following items that you experience.

	5	4	3	2	1
Ease of use	○	○	○	○	○
Understandability of operating instructions	○	○	○	○	○
Sufficiency of Information provided	○	○	○	○	○
Arrangement of order of context	○	○	○	○	○
Usefulness in terms of decision support system	○	○	○	○	○
Style of presentation	○	○	○	○	○
Ability to help understanding of strategic information system development	○	○	○	○	○

Note: 5 = Excellent, 4 = Good, 3 = Average, 2 = Fair, 1 = Poor

5. Comparing to your previous knowledge, did you think that your knowledge about strategic information systems improved after using it?
   - ◯ Significantly improved
   - ◯ Slightly improved
   - ◯ About the same
   - ◯ Not at all

6. After using this software, do you think it meets your requirements?
   - ◯ Fully met
   - ◯ Partially met
   - ◯ Not at all

7. Considering the usefulness to strategic information system development, how satisfied or dissatisfied are you with this software?
   - ◯ Completely satisfied
   - ◯ Mostly satisfied
   - ◯ Neither satisfied or dissatisfied
   - ◯ Mostly dissatisfied
   - ◯ Completely dissatisfied

8. What changes/improvements would you like to see in this software?

More features about example ideas, creative thinking, and considerations

9. Finally, what is your overall comment of this software?

Mostly satisfied

APPENDIX C

CONCEPTS EMPLOYED IN THIS RESEARCH

APPENDIX C
CONCEPTS EMPLOYED IN THIS RESEARCH

This section contains academic materials used in developing a conceptual model shown in figure 1 for the executive support systems (ESS).

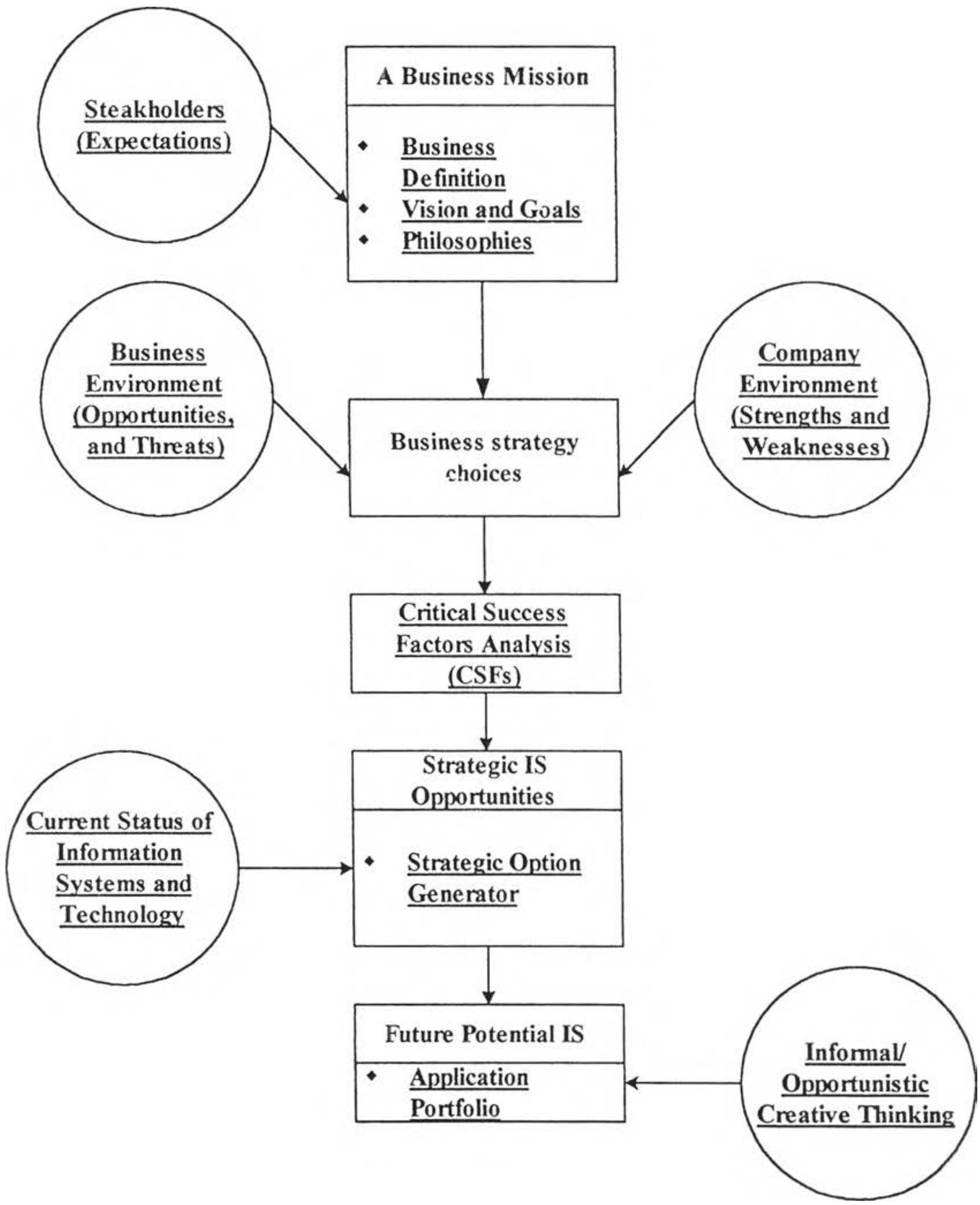


Figure C-1 The Conceptual Model for the Executive Support System

Figure C-1 illustrates steps in conceptual model for the ESS. The model begins with the development of a business mission, generates business strategy, identifies critical success factors, generates the possible IS applications, and then creates the application portfolio.

To develop this model, many issues involving strategic information systems have been investigated. The concepts used in this research can be concluded into two sections: the strategy formulation process and the development of information systems strategy.

1.1 The Strategy Formulation Process

1.1.1 The Business Mission
1.1.2 Developing a Business Mission Statement
1.1.3 The Business Environment
1.1.4 The Company Environment
1.1.5 Generating and Evaluating a Business Strategy

1.2 The Development of Information Systems Strategy

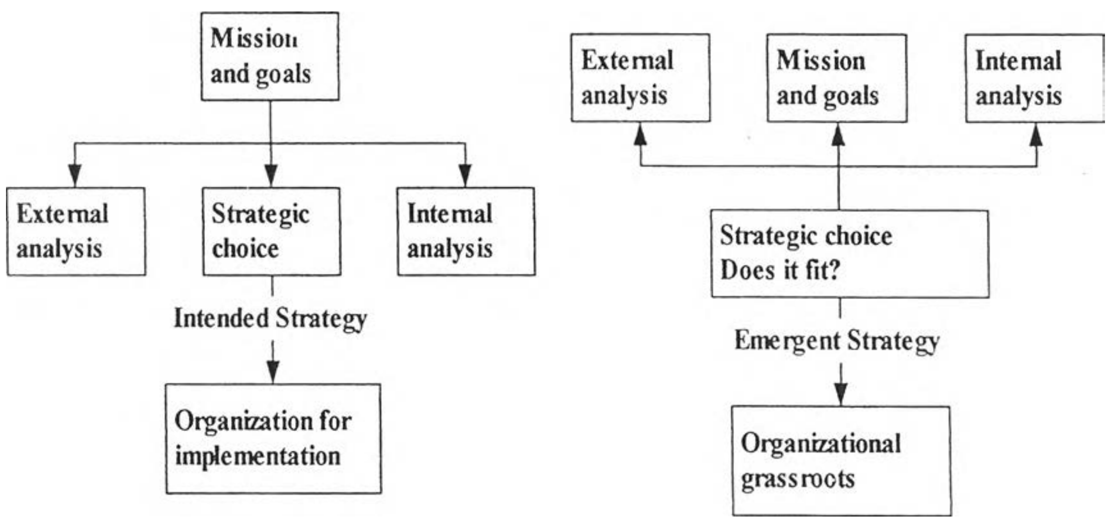
1.2.1 Critical Success Factors Analysis (CFS)
1.2.2 Using Model for SIS Opportunities
1.2.3 Current Status of IS and IT in the Industry
1.2.4 Determining the Future Application Portfolio
1.2.5 Managing the Application Portfolio
1.2.6 Informal/Opportunistic Creative Thinking

Firstly, the first section includes the strategy formulation process. It begins with the development of a business mission that includes business definition, vision, goals, and philosophies. To generate a business strategy, the business environment and the company environment must be investigated. Several analysis and development tools are also discussed in this section, including PEST analysis, TOWS matrix, Five Forces analysis, SWOT, and QSPM.

After the business strategy has been identified, the development of information systems strategy has been discussed. Critical success factors, the strategic option generator, and the application portfolio are the selected tools to be used in this section. Details in each step are discussed in the following sections:

1. 1 The Business Strategy Formulation Process

The strategy formulation is basically the process of analyzing the organization's external and internal environment and then selecting an appropriate strategy. Hill and Jones (1995) note that the traditional approach of strategy formulation process as shown in figure C-2 begins with identifying the mission statement and goals of the corporate, analyzing the external, internal environment, and then determining strategic choices. This top-down strategy formulation approach is widely used when formulating and implementing intended strategies. Emergent strategy, on the other hand, is usually a bottom-up approach by considering each emergent strategy whether it fits the organization's needs and capabilities.



Source: Adapted from Hill and Jones (1995)

Figure C-2 The Strategic Management Process

There are, however, criticisms of formal planning systems like these two models as shown in figure C-2. Prahalad and Hamel (1989, 1990) have attacked that the formal strategic planing models, known as the fit models, are too static and limiting. They state that adopting the fit model to strategy formulation lead management to focus too much on the degree of fit between the existing resources of a company and the current environmental opportunities, and not enough building upon new resources and capabilities to create and exploit future opportunities. Therefore, strategies formulated by the fit model tend to be more concerned with today's problems than tomorrow's opportunities. As a result, companies that depend mostly on the fit model approach are unlikely to be able to create and sustain a competitive advantage.

This is not meant that companies should neglect the analysis of external environment to identify opportunities and threats, the analysis of internal environment to realize their strengths and weaknesses, or the structural process required to implement different strategies. On the other hand, they do have to do all the steps mentioned earlier. What Prahad and Hamel suggest is that the strategic management process should begin with challenging goals. Then through out the formulation process the objective should be to find strategies to develop resources and capabilities to achieve these goals rather than using the existing strengths to take advantage of existing opportunities. Many successful companies in Japan, according to Prahad and Hamel, all had bold ambitions, which usually beyond their existing resources and capabilities. Then they are out to build the resources and capabilities that would enable them to achieve their goals.

1.1.1 The Business Mission

According to Ackoff (1987): "A business mission is the foundation for priorities, strategies, plans, and work assignments. It is the starting point for the design of managerial jobs, and, above all, for the design of managerial structures. Nothing may seem simpler than to know what a company's business is."

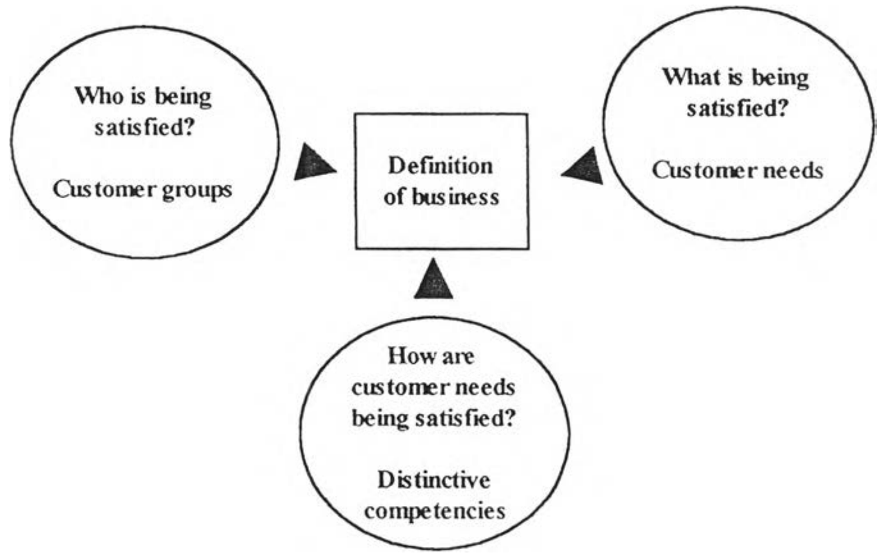
To better understand a business mission, it is useful to start from the beginning of the business. David (1997) suggests that basically, a new business is a collection of creative ideas. An owner believe that a new company can offer some product or service, to some customers, in some geographic areas, by using some type of technology, at a profitable price. This concept and philosophy of the business, when put into writing, reflects the same basic ideas that compose a mission statement.

Basically a mission statement includes three components: business definition, vision and major goals, and philosophies. The development of each one is discussed as follows:

♦ *Business definition*

A business definition is simply what our business is, what it will be, and what it should be. The answers vary, depending on whether the organization is a single business or a diversified enterprise. For a single business company, to define the business, Abell (1980) has suggested that a company should determine its business in terms of three dimensions: who is being satisfied (customer groups), what is being satisfied (customer needs), and how are customer needs being satisfied (by what skills or distinctive competencies)?

This model as shown in figure C-3 is very much a consumer-oriented not product-oriented business definition since to satisfy customer is the priority of the company's function. Abell notes that using consumer-oriented business definition can aslo prevent companies from being caught by major shifts in demand. Many evidences have shown that product-oriented companies failed to see what their business would become and consequently they declined such as the U.S. railroads, which went bankrupt by defining their industry wrong.



Source: Adapted from Abell (1980)

Figure C-3 Abell's framework for defining the business

♦ *Vision and Major goals*

Vision of a company is basically a formal declaration of what the company is trying to achieve over the medium to long-term. This gives the picture of what the business will be in the future, and how it will be operated. It is common that most visions commit the company to an ambitious goal like to be number one, the best, or the most customer oriented. However, it is also important to ensure that a vision is not too unrealistic and completely unattainable. Otherwise, a company might loose its credibility among employees or customers.

After stating their vision, a company can then identify the major goals in its mission statement. These goals are the lists of major achievement that will accomplish the vision. To be more precise, the purpose of these goals is to specify what must be done if the company is top achieve its vision. Hill and Jones (1998) suggest that to be meaningful, goals should have the following four characteristics

- Precise and Measurable.
- Address important issues.
- Challenging but realistic.
- Specify a time period.

Normally, the most important goal of almost every business organizations is survival since a company that is unable to survive will be incapable of satisfying the aims of any of it stakeholders. As a time goes by, however, goals concerning other issues may become among the most important. Examples of goals are shown as follows:

- Economic goals: survival, growth, and profitability.
- Social goals: deliver social benefits
- Competitive goals: beat competitors.

Both vision and goals will therefor provide the direction the company mission statement and further guide the formulation of the strategy.

♦ *Corporate philosophy*

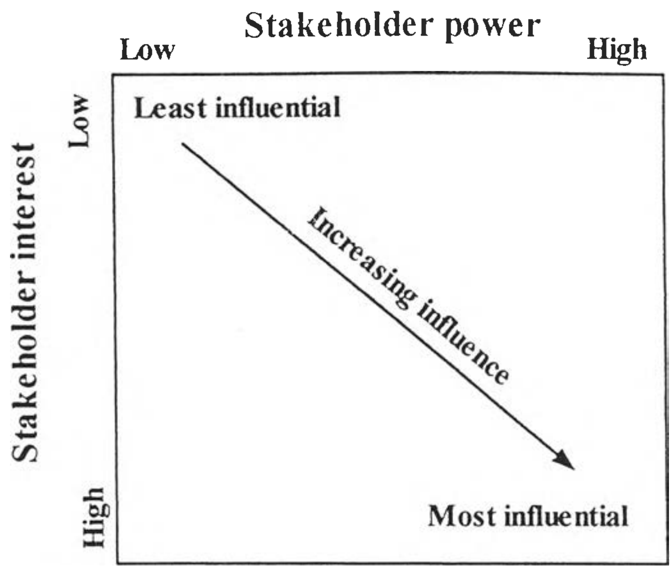
The corporate philosophy is the basic beliefs, values, aspirations and ethical priorities. It implies how the company intends to do business and usually reflects what responsibilities the company has to consumers, communities, minorities, environmentalists, and other groups. The corporate philosophy has direct impacts to the company's customers, products and services, markets, technology, self-concept, and the public image. The outlook of the business is sometimes quite important, especially with large companies whose businesses involve with many people and often many countries.

Business Stakeholders

Another issue that has to be considered during the development of business mission statement is the expectation form stakeholders. Rarely does only one person establish the business. There are always individuals or groups that provide a company with capital and in exchange expect and a reasonable return on their investment. Consequently, deciding the mission statement should be included the stakeholders' interests and concerns. A company should first identify its own stakeholders and their interests and concerns, evaluate what expects are the most important and likely to be made, and then determine their claims that can incorporate in the mission statement. These claims are very important for identifying business strategy as well.

Mendelow (1991) proposes one of the most widely used and useful models as shown in figure C-4 for understanding the influence of the stakeholders. According to this model, the stakeholders can be ranked depending on two variables: interest and power. Stakeholder interest refers to the willingness or the concern to influence the organization while stakeholder power means the ability to influence the organization. The result of the stakeholder influence is:

Stakeholder influence = power x interest



Source: Adapted from Mendelow (1991)

Figure C-4 The Stakeholder Map

The position of the stakeholders will depend how influential they are to the organization. A stakeholder with both high power and interest will be more influential than one with lower power and interest. The results from this model are very useful to help in evaluating the importance of each stakeholder expectations or claims for the organization.

1.1.2 Developing a business mission statement

To help owners/managers in developing a business mission statement step by step, Wootton and Horne (1997) suggest that they need to answer the following questions.

- What do you sell or provide?
  - Products: How many different types and ranges?
  - Services: Who could benefit form them and how?
- What do you intended to sell or provide in the future?
  - Products: How many different types and ranges?
  - Services: Who could benefit form them and how?
- Why would people use your product or service rather others?

- Who are your customers?

    - Individual members of the public?
    - What social class and locality?
    - Manufacturing companies? What size, nature, area?

- How do you reach your customers?

    - Passing trade, press advertisements, direct mail shots or through sales representatives or selling agencies?

- How do you obtain products or supplies?

    - Manufacture from raw material?
    - Assemble from intermediates?

- How do you provide your services?

    - Through partners, employees, contractors, franchisees?

- How do you sell to your customers?

    - Direct to the public, via manufacturers, through shops, using conventional or electronic mail?

- How do you support your sales or services?

    - How and where do you deliver?

The answers of these questions will provide a rough idea for owners/managers to identify the definition of their business regarding three dimensions discussed earlier in Abell's model. The first drafted statement may be as long as one page. But after keep refining and polishing, the final drafted statement should be comprehensive and read fluently, may be one or two long, complicated sentences, extending to perhaps half a page. Then later on, a vision or strategic direction can be extracted from this statement.

A vision, as discusses earlier, should state an organization aspiration for the future, embracing what it want and ought to do, as well as what it can do. After having stated a vision that is established on a consumer-oriented definition of the business, the next step is to identify major goals or objectives. The examples of desirable objectives are shown in figure C-5.

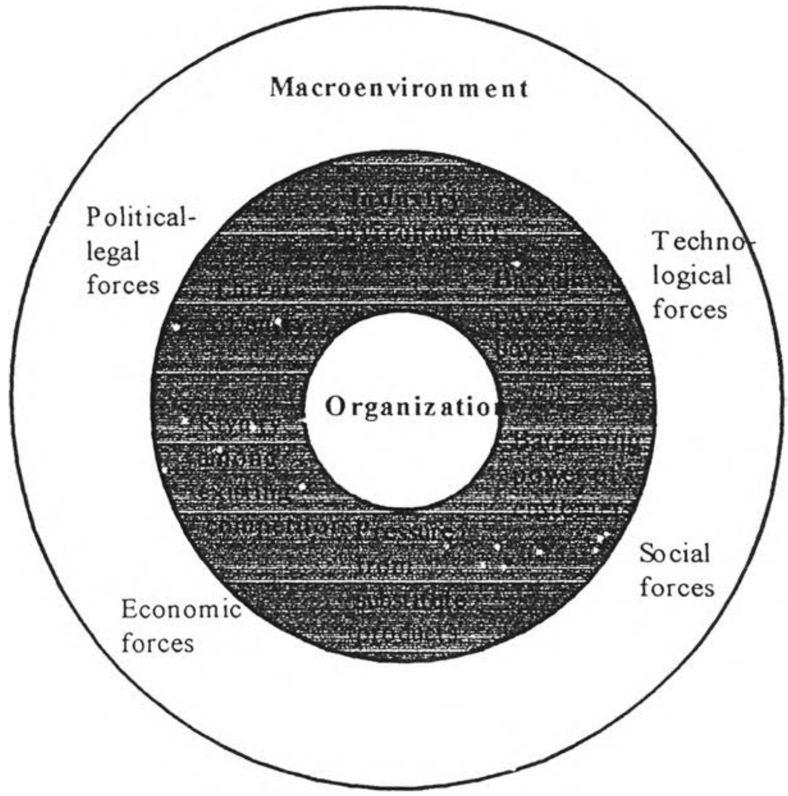
Directional objectives	Examples
Market leadership	Competitive ranking; rate of innovation; market share; licensing deals.
Market spread	Number of different markets; number of customer groups; number of industries; number of countries.
Performance objectives	
Growth	Increase in sales, output, profit, capital.
Investment	Return on capital; return on assets.
Profitability	Profit margin on sales; earning per share.
Internal objectives	
Efficiency	Ratio of sales to total assets; sales to stock
Personnel	Employee relations; morale; staff development; average employee pay; retention; levels of skill.
External objectives	
Social responsibility	Public relations; percentage recycled; community involvement; emissions; miles travelled by staff, suppliers, customers or finished goods. Charitable donations, endowmwnts, sponsorships.

Source: Adapted from Greenley (1986)

Figure C-5 Some Examples of Desirable Strategic Objectives

1.1.3 The business environment (External Analysis)

Basically, there are three layers as shown in figure C-6 to be considered when analyzing the environment in which the organization operates: the macroenvironment, the industry, and the organization itself. In this case, the analysis of the business or external environment will consider both the macroenvironment and the industry environment while the company or internal environment will include the analysis of the company itself.



Source: Adapted from Wright et al. (1996)

Figure C-6 Three levels of analysis

The analysis of the macroenvironment is very crucial since in practice every industry is embedded in this environment. Changes in the macroenvironment can have a significant impact on any part of the industry environment, thus shaping the structure of the industry. Another key aspect of the business environment is the industry in which a company competes. The analysis of the industry environment provides a company an understanding the rules of competition. Identifying and evaluating these two determinants can enable companies to develop a clear mission and design strategies to achieve their objectives.

♦ The Macroenvironment

Changes that occurred in the macroenvironment are mostly uncontrollable. Companies have little or no influence over these external factors. Therefore, identifying and evaluating them can significantly help companies to understand and then design strategies to achieve objectives. Basically, the macroenvironment can be divided into 4 factors: economic, social, political, and technology. Each factor is discussed as follows:

➢ Economic

According to Hill and Jones (1995), there are four major indicators of economic environment to be considered. The first is the growth rate of economy since it has a direct impact on competitive pressures. When economic grows, competition is not much intense. Companies have an opportunity to expand their businesses. Conversely, when economy declines, competitive pressures are increased. Companies have to compete with each other to be survived. The level of interest rates can also determine the demand of a company's product. Many consumers usually borrow money to but products. If interest rates increase, buying power from these consumers will be reduced. For a company point of view, rising interest rates can be viewed as a threat for new opportunities.

Currency exchange rates are the third indicator in economic forces. Movement in these exchange rates could turn the company's situation up side down, especially those who have debt with foreign companies or trade goods in foreign currency. Finally, the inflation rates are also the important factor to be concerned. In an inflationary environment, situations are unpredictable. It could slowdown economic growth, fluctuate currency rates, or even increase the interest rates. Usually, high inflation rates are considered as a threat to companies.

The perfect example of economic effects to the industry is perhaps the economic recession in the middle of 1997 through out Asia. For Thailand in particular, almost every industry was declined. Buying power is significantly reduced. Consumers become more conscious of buying unnecessary products. Many companies were out of business overnight from the plunging of Baht's value in 1997, especially those who have debt in foreign currency. Therefore, it is necessary to monitor all of these economic indicators regularly to be responsive to up-coming situations.

➢ Social

Social environment can create both opportunities and threats to an industry. New trends can create a different type of consumer, requirements, or preferences, and consequently new set of strategies. These days, customers become more knowledgeable and well educated. Expectations for the products are much higher. Companies need to carefully analyze this factor. Lifestyle changes can also present opportunities and threats. Many successful companies have recognized these changes early and capitalized on the opportunities or defended themselves against major threats.

➢ Political

Political and legal factors can have a major effect to companies. Laws and regulations imposed by government may restrict the opportunities to expand the business. On the contrary, by eliminating many legal restrictions, deregulation can create many opportunities since barriers to entry are lower but competition is more intense as well. Changes in a political party to manage the government may result in new sets of laws and regulations. Therefore, political forecasting can be crucial for some companies, especially with those that have to deal a lot with government.

➢ Technology

The revolutionary of technology can present both major opportunities and threats that must be considered in formulating strategies. Advance technology can create a whole new meaning of competition in the industry, for example new markets, new products or services, new competitors, and new customers. On the other hand, new technology can also eliminate the existing products from the market overnight. The replacement of personal computer with the typewriter is the example in this case. In rapid technology change industries such as electronics or communications, identification and evaluation of possible technology opportunities and threats can be the most important part of formulating strategy. Also in most industries, technology management is one of the key responsibilities of strategists. An effective technology strategy can enable a company to take advantage of technological opportunities to achieve and sustain competitive advantage in the market.

Campbell et al. (1999) also suggest that when managers carry out a STEP analysis, there are three important areas to consider how each factor might impact upon: the industry in which the organization competes, an organization's markets, and the internal parts of an organization. The analysis begins by scanning and monitoring the macroenvironment for actual or potential changes in social, technological, economic, and political factors and then assessing the relevance and importance of the changes for these three areas.

Macroenvironmental Force	Important Information
Political-Legal	Outcomes of elections, legislation, court judgments, and the decision rendered by various federal, state, and local agencies
Economic	GDP, short and long-term interest rates, inflation, and currency exchange rates
Technological	Scientific improvements, inventions, and the rate of technological change in the industry
Social	Traditions, values, societal trends, consumer psychology, and the public's expectations of the business

Source: Adapted from Wright, et al. (1996)

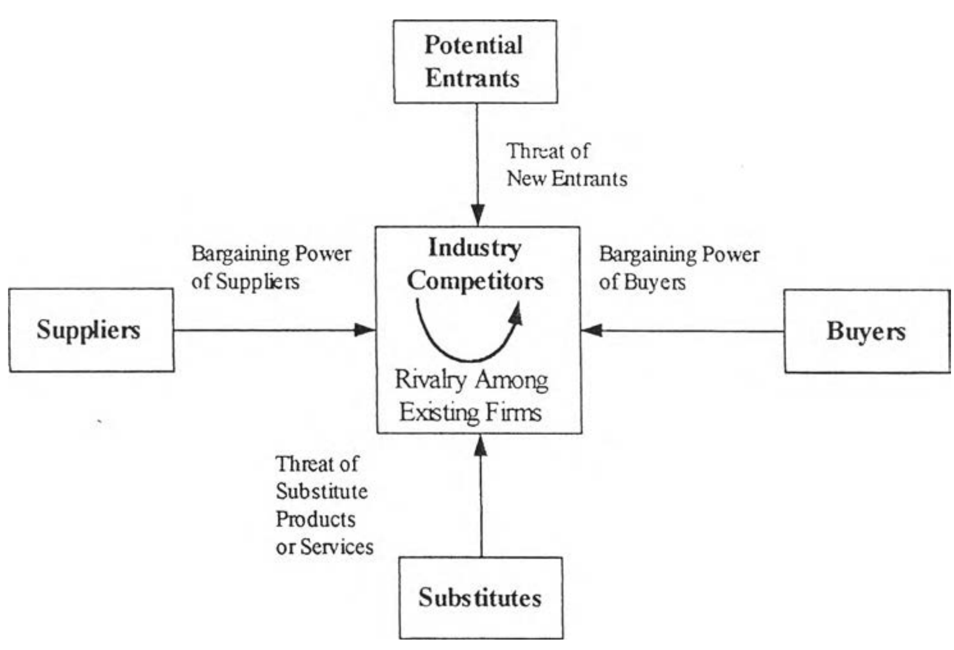
Figure C-7 The Macroenvironment Analysis Important Information

Analyzing these environment factors is very useful for strategy formulation. Johnson and Scholes (1993) suggest that companies need to determine what environmental factors are affecting the organization and then identify which of these are the most important at present time and in the next few years. The result of the analysis will be very important to the identification of long-term drivers of change and can help companies in long-term planning as well. Figure C-7 shows the important information needed to consider in analyzing the macroenvironment.

♦ The Industry Environment

➢ The Structural Analysis of Industries

Industry structure has a strong impact on the rules of competition and the potential strategies available to a company. Formulating a competitive strategy is therefore relating a company to its industry environment and finding a position where it can best compete. Porter (1985) identifies that the state of competition in an industry depends on five basic competitive forces: threat of new entrants, bargaining power of suppliers, bargaining power of buyers, threat of substitute products, and rivalry among existing firms. All of these five forces jointly create the intensity in industry competition and profitability. Understanding these forces is a good starting point for strategy formulation. Figure C-8 illustrates the five competitive forces that shape the industry competition.



Source: Adapted from Porter (1985)

Figure C-8 The Five Competitive Forces that Determine Industry Profitability

➤ Threat of New Entrants

For established companies, new entrants mean more competitors and potential threats to profitability. New companies often enter industries with higher quality products, lower prices, and substantial resources, and thus making them more attractive. Managers need to carefully monitor these new companies in order to counter attack with new strategies, if necessary. The threat of new entrants depends on the barriers to entry that are present and the reaction from the existing competitors. Porter notes that there are seven major sources of barriers to entry to be considered. These major sources imply whether there are significant costs or disadvantages to join an industry.

Economies of Scale

Economies of scale refer to the decline of unit cost when the production volume per period increases. Large companies reduce their costs through mass production, standardized product, or discount on large purchases of raw materials. If cost advantages are significant, then small companies are forced to either come in small scale and put up with cost disadvantages, or spend heavily to produce large volume to reduce their costs.

Product Differentiation

In this case, product differentiation means the brand recognition and customer loyalties of established companies. Product differentiation forces new entrants to spend more money and time to build their brand name in order to overcome existing customer loyalties with established companies. In some industries such as pharmaceutical industry, building a new brand name to beat those of established companies could be very difficult and costly task to be done.

Capital Requirements

High start-up costs, expensive facilities, and other large financial resources required to enter the industry can create a barrier to entry. The huge capital requirements deter small companies or even large companies because the risk is usually high. Investing large capital also means that it is difficult to exit without losses if things go wrong.

Switching Costs

Switching costs are one-time costs facing the buyer to switch from one supplier's product or service to another's. If these cost are high, the buyer is unlikely to change supplier unless major improvement in cost or performance is given by new entrants.

Access to Distribution Channels

If the distribution channels are the major factor to the success of the industry, access to these channels can be an important barrier to the new entrants. Most of established companies already have their distribution channels. Trying to persuade these channels to accept new products or services might be difficult. Sometimes this barrier is so high and even forces new entrants to create their own channels if they need to enter the industry.

Cost Disadvantage Independent of Scale

Sometimes established companies have their cost advantages that can not replicable by new entrants. Product know-how, favorable access to raw materials, favorable locations, government subsidies, or learning curve is the example of these cost advantages.

Government Policy

Government policy can be a crucial barrier to new entrants. In some industries, government may limit a number of companies or the use of raw materials to some extent in specific industries. This makes it much more difficult or even impossible for new entrants to enter those industries.

Another barrier to the new entrants is the expected reaction from existing competitors. If the coming of new entrants is considered a major threat to existing competitors, they might try everything to force new entrants out of their businesses. Condition like this can deter potential entrants to come in the industry.

➢ Intensity of Rivalry Among Existing Competitors

The intensity of rivalry among existing competitors occurs when one or more competitors either feels the pressure or spots the opportunity to improve position. If this force is weak, companies have an opportunity to expand business, raise prices, and earn greater profits. Conversely, if this force is strong, competition is much more intense. Price cuts, advertising battles, resource competition, and retaliatory countermoves are likely to happen. Porter identifies that the intense rivalry is the result of the following interacting structural factors:

Numerous or Equally Balanced Competitors

When numerous competitors exist in the industry, movements or strategy pursued by some companies may not be noticed. On the other hand, if existing competitors are equally balanced, they may be prone to vigorously fight with each other to compete for their positions or resources. When one or a few companies have dominated the industry, the leader or leaders usually impose rules or disciplines in the industry through devices like price leader ship.

Slow Industry Growth

In slow industry growth, competition is usually expanding the market. Companies are fighting in terms of market share competition. In rapid industry growth, companies are just keeping pace and expanding with the industry.

High Fixed or Storage Costs

If companies have high fixed costs, large production volume is expected to break even. This usually leads to excess capacity and price cuts eventually. Likewise, if storage costs for products are costly, companies are vulnerable to reduce prices in order to increase sales.

Lack of Differentiation or Switching Costs

The lack of differentiation (preferences and loyalties) and switching costs, described earlier, can lead to intense competition, especially in commodity market. Purchasing decision from buyers is mostly based on prices or services. Therefore, intense price and service competition result.

Capacity Augment in Large Increments

Large additional capacity can periodically affect the industry supply/demand balance. Recurring periods of over capacity and price-cutting can occur, especially in the industry where economies of scale and large incremental capacity are the key factors of cost advantages.

Diverse Competitors

When facing diverse strategies, goals and characteristics from many competitors, the company may find it difficult to compete properly with them. Strategic options right for one competitor may be wrong for others.

High Strategic Stakes

If there are a number of companies having high stakes in achieving success in the industry, rivalry among these companies becomes very intense. Each one will have to fight for its own success since there are not many differences in company's capabilities.

High Exit Barriers

High exit barriers can also keep companies competing in business even they may earning low or even negative returns on investment. High fixed costs of exit and strategic interrelationships between businesses are the examples of these barriers. Government restrictions are also a major factor for companies to abandon their businesses. The concern of job loss and regional economic effects force a government to have regulations with companies in some industries to stay for at least a certain period before exiting the business. The battle of these desperate companies is often violent.

➢ Threat of Substitute Products or Services

The existence of close substitute products present a strong competitive force for a company and often limits the price the company can profitably charge. Substitute products are the other products that can perform function as the product in the industry. Porter suggests two kinds of substitute products that deserve the most attention: (1) those that are subject to trends improving their price-performance tradeoff with the industry's product or (2) those that are produced by industries earning high profits. These kinds of substitute products can cause significant price reduction or performance improvement in the industry.

➢ Bargaining Power of Buyers

Buyers can be viewed as a competitive force to companies when they force to reduce prices or demand higher quality and more services. The significance of their powers depends on market situation characteristics and the relative importance of their purchases to the overall business. Porter identifies the following circumstances where buyers are powerful:

1. When purchase volume is large.
2. When purchased products represents a significant fraction of the buyer's costs or purchases.
3. When products are standard or undifferentiated.
4. When switching costs are few.
5. When buyer earns low profits.
6. When buyer pose a threat of backward integration.
7. When the product is not important to the quality of buyers' products or services.
8. When the buyer has full information about demand, actual market prices, and supplier costs.

When buyers are in the driving seat, they often negotiate selling prices, warrantee coverage, and whatever options possible to a great extent. Companies, however, may try to alter this power by selecting buyers who possess the least power as possible to be able to raise prices and earns greater profits.

➢ Bargaining Power of Suppliers

Suppliers can also pose a threat to companies by raising prices or reducing the quality of goods and services. Weak suppliers, on the other hand, give a company to force down prices demand higher quality of the products. The conditions that make suppliers powerful are quite a reflection to those of buyers. According to Porter, suppliers are powerful if the followings apply:

1. When only few companies dominate the industry.
2. When suppliers are not obliged to contend with other substitute products in the industry.
3. When the industry is not an important customer of the supplier group.
4. When the suppliers' product is an important part of the buyer's business.
5. When the supplier group' s products are differentiated or it has high switching costs.
6. When the supplier group poses a credible threat of forward integration.

Porter also suggests that labor can be viewed as a supplier as well. Highly skilled employees can have a significant bargaining power to a company for higher paid. Again, companies can also reduce by posing a threat of backward integration or seek to eliminate switching costs as discussed in bargaining power of buyers earlier.

To summarize the questions and issues to be considered during the analysis of Porter's five forces, the five forces applied are shown in figure C-9.

♦ The Application of Porter's Five Forces Model

To Analyze	*Ask These Questions:*	*Consider These Issues:*
Customers	How critical am I to my customer? How critical is my customer to me? How many alternatives does my customer have? Can my customer demand pricing concessions? Would I profit from an alliance with this customer?	Brand identity Switching costs Product differences Impact on quality/performance Likelihood of backward integration Buyer concentration: supplier concentration
Suppliers	Should I form an alliance with this supplier? What options do I have besides this supplier? What options does this supplier have besides me? Is this particular supplier critical to my success? Is the good or service being supplied critical to my success? Can this supplier force its cost increase on me in the form of higher supply prices?	Supplier concentration Differentiation of supplier Threat of forward integration Substitute supplies available Likelihood of forward integration Importance of volume to supplier Supplies' impact on cost or differentiation Switching costs of suppliers and firms in industry Supply costs relative to total purchase in industry
New entrants	Who would be most likely to want to enter this market? Why? How can I retaliate when a new entrant comes into this market? What would discourage new competitors from entering this market? How can my advantages as an incumbent be made more obvious to would-be entrants? As and incumbent, what advantages would I have that new entrants would need to overcome? How can I signal my intention to retaliate before a new competitor actually enters this market?	Switching costs Government policy Economies of scale Expected retaliation Capital requirements Access to distribution Proprietary learning curve
Substitutes	If goods or services like the ones I offer did not exist, how would my customers meet their needs that I 'm supplying today? How easy would it be to convince my customer to adopt an entirely different approach to meeting the needs I fill for them? Are there alternatives to my goods and services that are radically cheaper or better? Is there anyone trying to develop a totally different approach to serving my customers? Who outside my industry would be most interested in stealing my customers?	Switching costs Buyer propensity to substitute Number of dimensions of customer value Relative price performance of substitutes

Rivalry	Who are my most powerful competitors? How do I compare to these powerful competitors? Is there a way that I can reduce the level of rivalry in this market? What are my competitors' different sources of marketplace power? What factors are likely to heighten or diminish competition in this industry? Do my competitors aggressively combat one another, or is there more of a live and let live attitude?	Exist barriers Brand identity Industry growth Switching costs Product differences Diversity of competitors Concentration and balance of rivals

Source: Adapted from Miller (1998)

Figure C-9 The Five Forces Applied

1.1.4 The Company Environment (Internal Analysis)

After assessment of external environment of the business, it is equally important to perform an internal audit to be able to identify the resources and strategic capability of the organization. All organizations have strengths and weaknesses in their business. Understanding of these issues is very critical to the formulation of the business strategy. According to Ward and Griffiths (1996), the internal analysis includes the following analysis of:

- the resource available within the organization for the use of products or services being offered by the organization,
- the financial status of the organization,
- the people, their skills, training, experience, motivation, and the competitiveness of the organization,
- the physical assets, technology employed, its usefulness,
- research and development, the quality of the past history of R&D function,
- the organization, its structure, relationships, attitudes and culture, and the effectiveness of the operation and management and its ability to adapt to changing circumstances.

The purpose of this analysis is to enable a company to position itself to take advantage of particular opportunities and to avoid or minimize environmental threats. This type of analysis is often called SWOT (Strengths, Weaknesses, Opportunities and Threats). SWOT analysis is based on an assumption that an effective strategy derives from a good fit between internal resources and capabilities of an organization (strengths and weaknesses) and its external environment situation (opportunities and threats). Once the analysis has been completed, a company can then find ways to use its strengths to exploit opportunities, while identifying its weaknesses and defending the possible threats.

♦ SWOT Analysis

➢ Strengths

A strength is a resource advantage relative to competitors and the needs of the market in which a company operates. A company's strength that can not be easily matched by competitors is called a distinctive competence. Recognized brand, customer loyalty, product differentiation, cost advantage, or highly skilled employee is the example of strengths to be considered.

➢ Weaknesses

A weakness is a resource disadvantage relative to competitors that deter a company performance. Limitation in human resources, capital, equipment, distribution channel, or lack of brand identity could be viewed as a possible threat to a company, for example.

➢ Opportunities

Opportunities are trends or situations that are favorable in a company's environment. For instance, growing market, increasing demand, laws or registrations that are favorable to the company's business could be considered as an opportunity to the company.

➢ Threats

In contrast with opportunities, threats are major unfavorable in a company's environment. The entrance of new competitors, economic recession, increased bargaining power of suppliers and customers, the up coming new substitute products, new registrations or laws against the operation of the company are the examples of possible threats that could endanger the company's situation in the business

Figure C-10 summarizes the sources of possible external environmental opportunities and threats and possible organizational strengths and weaknesses to be considered. The results from the business environmental analysis discussed earlier will provide the information needed to identify both external opportunities and threats, the first part of SWOT analysis.

Sources of Possible External Environmental Opportunities and Threats			
Economic forces	Political-legal forces	Social forces	Technological forces
Industry forces			
Possible Organizational Strengths and Weaknesses			
Access to raw materials	Distribution	Management	Purchasing
Advertising	Economies of scale	Manufacturing and Operations	Quality control
Board of directors	Environmental scanning	Market share	Research and development
Brand names	Financial resources	Organizational structure	Selling
Channel management	Forecasting	Physical facilities/ equipment	Strategic control
Company reputation	Government lobbying	Product/service differentiation	Strategy formulation
Computer information system	Human resources	Product/service quality	Strategy implementation
Control systems	Labor relations	Promotion	Technology
Costs	Leadership		
Customer loyalty	Location	Public relations	Inventory management
Decision making			

Source: Adapted from Wright et al. (1996)

Figure C-10 The Framework for SWOT Analysis

1.1.5 Generating and Evaluating A Business Strategy

After a company has identified its business mission statement, analyzed its external environment, and internal environment, the next step of strategy formulation is to generate feasible alternative strategies. David (1997) notes that there are three major stages of a comprehensive strategy-formulation framework: the input stage, the matching stage, and the decision stage. The input stage is to summarize the basic input needed to formulate strategies such as external and internal analysis. The second stage is to match external and internal factors in order to generate feasible alternative strategies. Finally, the decision stage is to use input from stage 1 to objectively evaluate alternative strategies define in stage 2.

♦ The Input Stage

The information from the external and internal analysis provides a number of the lists of strengths, weaknesses, opportunities, and threats. These lists are often too many issues to consider for most people to use in strategy formulation. Therefore, it is more useful to condense these lists into a reasonable number like 10 or so strategic factors. This is done by simply reviewing and weighting each factor by good judgment. The result is the priority lists of each factor to be considered as a key factor of the company success. Figure C-11 shows the selection of strategic factor priority.

Internal Factors	Weight	Rating	Weighted Scored	Comments
Strengths				
S1	0.20	4	0.80	
S2	0.10	3	0.30	
S3	0.10	2	0.20	
Weaknesses				
W1	0.15	2	0.30	
W2	0.25	4	1.00	
W3	0.10	3	0.30	
W4	0.10	1	0.10	
Total	1.00		3.00	

External Factors	Weight	Rating	Weighted Scored	Comments
Opportunities				
O1	0.15	5	0.75	
O2	0.25	4	1.00	
O3	0.10	2	0.20	
Threats				
T1	0.30	3	0.90	
T2	0.05	1	0.05	
T3	0.05	2	0.10	
T4	0.05	1	0.05	
T5	0.05	1	0.05	
Total	0.95		3.10	

Note: The weight column must total 1.00

Figure C-11 The Selection of Strategic Factor Priority

♦ The Matching Stage

According to Wheelen and Hunger (2000), the TOWS matrix illustrates how the external opportunities and threats facing a particular company can be matched with its internal strengths and weaknesses to result in four set of possible strategic alternatives: SO, WO, ST, and WT strategies. This matrix is a good way to collect ideas from brainstorming to create alternative strategies, which otherwise might not be considered. It can be used to generate corporate as well as business strategies. Figure C-12 shows the TOWS matrix used in this study.

INTERNAL FACTORS / EXTERNAL FACTORS	Strengths (S) List 5-10 internal strengths here	Weaknesses (W) List 5-10 internal weaknesses here
Opportunities (O) List 5-10 external opportunities here	SO Strategies Generate strategies here that use strengths to take advantage of opportunities	WO Strategies Generate strategies here that take advantage of opportunities by overcoming weaknesses
Threats (T) List 5-10 external threats here	ST Strategies Generate strategies here that use strengths to avoid threats	WT Strategies Generate strategies here that minimize weaknesses and avoid threats

Source: Adapted from Welhrich, (1982)

Figure C-12 TOWS Matrix

♦ Steps in Using TOWS Matrix

- List external opportunities available in the company's current and future environment and external threats facing the company now and in the future.
- List the areas that the company has strengths and weaknesses now and in the future.
- Generate a series of possible strategies based on the considerations of the four combinations of the matrix (SO, WO, ST, and WT strategies).

The lists of strengths, weaknesses, opportunities, and threats can be obtained from the selection of strategic factors discussed in the previous section. The results obtained by this matrix are the lists of feasible alternative strategies. Not all of these strategies will be selected for implementation. The selection of these strategies is discusses in the following section.

♦ The Decision Stage

Given a number of feasible strategies that could benefit the company, managers or strategists need to limit this number into a manageable set of most attractive strategies to be implemented. There are a number of tools and techniques conducted to provide an analysis of strategy evaluation. The selected method that will be used in this research is the Quantitative Strategic Planning Matrix (QSPM). This matrix uses input from the input stage and the matching stage described in the previous section to decide objectively among the given alternative strategies. Figure C-13 shows a QSPM used in this study.

	Strategic Alternatives					
	Strategy 1			Strategy 2		
Keyl Factors	Weight	AS	TAS	Weight	AS	TAS
Strengths						
S1						
S2						
S3						
S4						
S5						
Weaknesses						
W1						
W2						
W3						
W4						
W5						
Opportunities						
O1						
O2						
O3						
O4						
O5						
Threats						
T1						
T2						
T3						
T4						
T5						
Total						

Source: Adapted from David (1997)

Figure C-13 The Quantitative Strategic Planning Matrix (QSPM)

♦ Steps in Using QSPM

- ➢ List the four external and internal key factors in the left column. These factors should be taken directly from the selection of strategic factor priority.
- ➢ Assign weights to each factor. These weights are identical to those in the selection of strategic factor priority.
- ➢ Identify strategic alternatives that the organization should consider implementing.
- ➢ Define the attractiveness score of each strategy relative to each external and internal strategic factor by examining the effect of each factor on a given strategy.

- Compute the total attractiveness scores.
- Compute the sum of total attractiveness scores.

The QSPM can be applied to virtually any type of organization. This technique objectively indicates which alternative strategies are best. Evaluating alternative strategies using QSPM also ensures that major external and internal factors affecting these strategies are not overlooked. However, the QSPM obviously requires good intuitive judgment. Weighting assigned to each factor and strategy should be rational and reasonable. Therefore, discussion among managers, strategists, employees is required to make a rational decision. The other limitation of this model is that it largely depends on the information obtained from the analysis of external and internal environment of the organization. If this analysis is not appropriately conducted, the result from QSPM is then unlikely to be appropriate.

1.2 The Development of Information Systems Strategy

After the business strategies have been established, the next step is to identify the information that is critical to the success of these strategic goals. Therefore, the organization can identify what information systems are needed. There are a number of techniques proposed to develop a picture of an organization's strategic information requirements. Among them, Critical Success Factor analysis, one of the most widely used techniques, will be used in this research.

1.2.1 Critical Success Factor Analysis (CSF)

Critical Success Factor analysis (CFS) was first proposed by Rockart (1979) as a tool to help IS management identify their needs in terms of information that is critical to them. The factors identified are then used as the basis for the company's management information systems. CSF analysis therefore clearly links the possible information system applications to business objectives and thus demonstrates alignment with the business strategy. Ward and Griffiths (1996) state that CSF analysis is a most effective technique in involving management in IS planning since it is completely rooted in business issues, and in gaining their commitment to propose IS applications.

Remenyi (1991) also confirms that these CSFs are the thing that must be identified if the corporate strategic plan is to be realized. In the process of developing strategic information systems, these CSFs will be matched against specific IS application systems to assist the rationalization of the plan. Figure C-14 shows a role of CSFs as a bridge into information requirements.

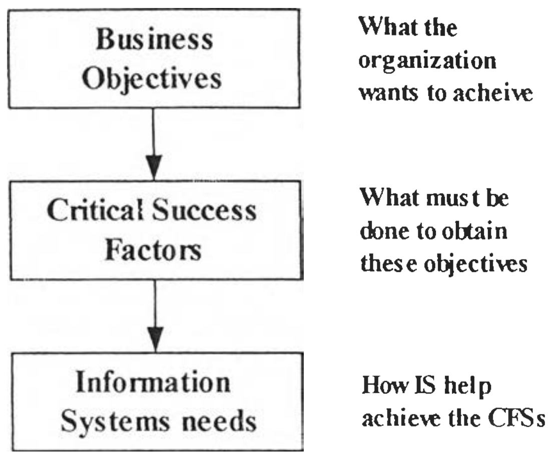


Figure C-14 Critical Success Factor Analysis as a bridge into information requirements

♦ Steps in Using a CSF analysis

➢ Interpret the business strategy

Interpreting the business strategy will result in specific objectives for parts of the organization. These objectives are usually the strategic objectives or tactical objectives, which the company wants to achieve in medium and short term.

➢ Identify CSFs against each objective

The second step is to identify which factors are critical for accomplishing these objectives. In this stage, a number of CSFs may occur. Therefore, prioritizing is needed. Between 5-8 CSFs for each objective is a reasonable number to be analyzed.

➢ Determine key performance indicator

Key performance indicators serve as a bridge between what is important and the IS applications essential to support it (the information requirement). These indicators refer to measurements that can be used to identify whether things are going right or not.

♦ Sources of Critical Success Factors

- **Industry** (competitive forces in industry)
- **Company** (strategy, strengths and weaknesses)
- **Environment** (political, economic, social, and technology)
- **Temporal** (areas that might be important and required temporarily attention)

Objectives	CSFs	Key performance indicators
Improve customer satisfaction	Improve product quality	Number of customer complaints
	Reduce service time	Average service time/job
	Reduce ordering processes	Average
	Reduce delivery lead-time	Average lead-time/order
Increase sales	Find new markets	Sales reporting
	Find new products	
	Find new customers	

Figure C-15 The Example of Critical Success Factor Analysis

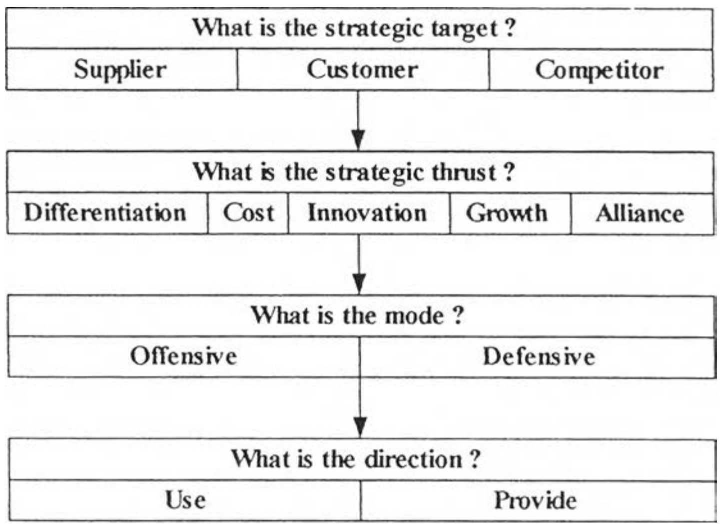
The results from CSF analysis are the most important part for the IS strategy since they define the most important factors of the business success. However, it is recommended that CSF analysis should be established by a group process involving key personnel rather than separate interviews since it is important to achieve consensus throughout the process. Once agreement is reached, then the potential IS opportunities for each CSF should be considered. Figure C-15 shows the example of critical success factor analysis.

1.2.2 Using model for Strategic Information System Opportunities

After identifying key information needs from a CSF analysis, the company can then consider strategic information system opportunities to provide information required. There are several IS strategic planning models to be considered such as Porter and Millar's model, McFarlan's framework or Wiseman's strategic option generator. In this research, the author uses Wiseman's strategic option generator to identify some possible IS specific opportunities in the decision support system.

♦ Strategic Option Generator

Based on the theory of strategic thrusts, Wiseman (1985) develops an instrument, the strategic option generator, to identify possible strategic information system opportunities. The strategic option generator serves as a conceptual model by prompting a series of questions related to four major issues: strategic targets, strategic thrusts, mode, and direction to the users to systematically search for the possibility of strategic IS opportunities.



Source: Adapted from Wiseman (1985)

Figure C-16 Strategic Option Generator

Wiseman suggests that the purpose of strategic option generator, as shown in figure C-16, is to simply to assist users in generating a hit list of potential strategic targets as many as possible. It is from this list that the company selects those that are likely to be suitable for attack by strategic thrusts and information systems.

The strategic option generator approach requires a thorough understanding of the industry, the company's competitive position, and a clearly understood of business strategy. Therefore, the results of several analyses from the beginning plus key information requirements derived from the CSF analysis adequately provide information needed to help identifying the potential strategic IS opportunities by using this model. Details of each stage of the strategic option generator are discussed in the next sections.

➢ Strategic Targets

According to this model, there are three generic classes of strategic targets: suppliers, customers, and competitors that should be considered when using information systems to gain a competitive advantage. Some companies have focused on multiple targets. However, it is important to identify and understand the primary target. Callon (1996) suggests that the real value in using the strategic option generator is to understand the focus and logic of a major business strategy that results in the successful use of information systems.

1. Supplier targets

Supplier targets include organizations that provide what the company needs to make its product ready for sale such as those providing raw materials, finished goods, labor, capital, utilities, services, transportation, and the like.

2. Customer targets

Customer targets include consumers and direct customer that purchase the company's product for their own use or for selling it to end-users such as consumers, retailers, wholesalers, government, distributors, middlemen, or financial institutions.

3. Competitor targets

Competitor targets include organizations selling or potentially selling very similar or substitutable products to the company's product. Wiseman defines competitors into three subclasses: direct competitors (those selling the similar or same products), potential competitors (those who may enter industry to sell the same or similar products, and substitute competitors (those selling, or who may sell substitutable products).

Evaluating what target is the primary target can be difficult since most of competitive strategies have directly or indirectly focused on industry competition. In making this decision, it is essential to start with the target considering in the business strategy. Then the company can think of possible IS to gain and sustain competitive advantage from them. Figure C-17 shows the example of question that might be used to the identification of the strategic targets.

Callon (1996) also suggests a logical and simple advice regarding this evaluation that " when in doubt, think customer". It is probably safe for a new company with a new business strategy supported by information systems to consider customers as the primary target since impressing them from the first time is very important to gain their supports for the next.

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1. *Suppliers:* **can we use IS/IT to:**
    - Gain leverage over our suppliers (improving our bargaining power or reducing theirs)?
    - Reduce buying costs?
    - Reduce the supplier's costs?
    - Be the better customer and obtain a better service?
    - Identify alternative sources of supply?
    - Improve the quality of products/services purchased?
2. *Customers:* **can we use IS/IT to:**
    - Reduce customers' costs an/or increase their revenue?
    - Increase our customers' switching costs (to alternative suppliers)?
    - Increase our customers' knowledge of our products/services?
    - Improve support/service to customers and/or reduce the cost of existing services?
    - Discover more about our customers and their needs?
    - Identify new potential customers?
3. *Competitors:* **can we use IS/IT to:**
    - Raise the entry cost of potential competitors?
    - Differentiate (or create new) products/services?
    - Reduce our costs/increase competitors' costs?
    - Alter the channel of distribution?
    - Identify/establish a new market niche?
    - Form joint ventures to enter new markets?

Source: Adapted from Ward and Griffiths (1996)

Figure C-17 The Strategic Targets Analysis Questions

➢ Strategic Thrusts

1. Differentiation

Differentiation is concerned with being better in terms of the quality of the product or service, thus making competitors less appealing to the customers, and being better customer of suppliers to obtain preferential service. Sources of differentiation can be many things. Wiseman classifies differentiation into three categories: expected product, augmented product, and marketing support. Expected product refers to the minimal expectations for the product from customers. Information systems used to support this is usually concerned with respect to marketing mix elements such as:

- **Product:** products available, product features.
- **Price:** product prices, credit terms, discount, and allowance available
- **Distribution:** channel of distribution, time of delivery.
- **Promotion:** sales promotion, advertising.

Augmented product refers to things that beyond the customer's minimal expectation for the product. Whatever benefits or pleases customer and can be added to the expected product should be considered as a differentiation thrust for the company. The followings are the examples of augmented product differentiation with respect to the marketing mix elements.

- **Product:** new up coming products, new ordering methods.
- **Price:** daily updated price.
- **Distribution:** product delivery status.
- **Promotion:** new methods of advertising.

The use of information systems to support or shape the marketing support is concerned with activities related to the company's differentiated product. These activities include product planning, marketing planning, media selection, promotion, and research and development.

2. Cost

Strategic cost thrusts are strategies intended to reduce the company's costs or enable suppliers or customers to reduce their costs, thus making the company more attractive to do business with them. Alternatively, some strategies may be used to increase competitors' costs. The examples of the uses of information systems regarding strategic cost thrusts are:

- Reduce labor costs by using computer systems.
- Reduce inventory holding costs by forecasting demand in advance from marketing information.
- Reduce the costs of purchasing by new ordering methods.

3. Innovation

Innovation thrusts refer to adopting of new products, processes or services that can help change the company's operating style or even the competitive forces in the industry. Innovation can be divided into 2 classes: a product innovation and a process innovation. A product innovation provides unexpected satisfaction to customers while a process innovation improves the efficiency or effectiveness of a process associated with a product.

4. Growth

The growth of companies involves 2 dimensions: product and function. Product growth refers to the expansion of product lines or product ranges, thereby entailing the expansion of markets, customer bases, or new technologies. Functional growth concerns the activities relating to the company's product such as production, distribution, or inventory. However, these thrusts should not incur any additional or indirect overhead costs to the company, if implemented effectively.

5. Alliances

Alliance thrusts include the use of information systems to enhance the relationship with customers or suppliers. There are three forms of strategic alliances: acquisition, joint venture, and agreement. Partnership may include the product integration, product distribution, product extension, or product development. This forming of partnership help to achieve advantage or increase the effectiveness of the other thrusts mentioned earlier.

➢ Mode

The mode of a strategic thrust refers to whether the thrust is used offensively to create a competitive advantage over selected targets or to defensively to reduce a competitive advantage possessed by one of the targets. Selecting which mode depends on the risks involved both business and technology. Being first could have a significant advantage, but the risk might be higher than approaching with the proven methods.

➢ Direction

The direction of a strategic thrust indicates the users of the information systems selected by the company. If the information systems are used within the boundaries of the company then the direction is "use". If the use of the systems extends beyond the boundaries of the company that is providing the systems, the direction is "provide".

♦ Using the Strategic Option Generator

Steps in using the strategic option generator begin with identifying the business and continue through the selection of strategic thrusts, mode, and direction. The target identification is quite straightforward, common mistakes, however, usually occur during the strategic thrust selection. According to Porter, differentiation or cost must be selected, but not both. Beyond this, none or any of the combination of the other thrusts can be logically added. The company can be either offensive or defensive with the mode, and can select the direction of use or provide or both of them for the purposes of information systems.

1.2.3 <u>Current Status of Information Systems and Technology in the industry</u>

Identifying IS applications is inevitably involving the technology at some extent. Some applications need to be integrated with others in order to achieve the intended objectives. Current technology in the industry then needs to be considered before selecting the systems. If there are no facilities or systems to support, the selected applications could not be implemented. Therefore, it is important that, while identifying IS applications, we have to consider the existing capabilities of technologies, facilities, and support systems available in the industry.

1.2.4 <u>Determining the Future Applications Portfolio</u>

After refining the strategic information systems applications from the previous part, the company needs to bring those strategic and high potential applications derived from various routes, assess them, and then classify them in terms of their contribution to the business now and in the future order to ensure that they are managed success fully.

♦ The Application Portfolio

The application portfolio is a simple model providing an analysis of existing, planned, and potential applications into four quadrants based on as assessment of the current and future business importance of applications. An application can be classified as strategic, high potential, key operational, and support, depending on its current business contribution to the company.

Strategic	High Potentail
applications which are critical to sustaining future business strategy	applications which may be important in achieving future success
applications on which the organization currently depends for success	applications which are valuable but not critical to success
Key Operational	Support

Source: Adapted from Ward and Griffiths (1996)

Figure C-18 Information Systems and Their Business Contribution: Application Portfolio

Like the products, the IS applications in the portfolio have their life cycles. The will move around the matrix over time. High potential applications could become strategic applications. When these applications are commonly in place across the industry, they move to key operational. Ultimately, when the competition is changed, applications may be of support value only.

1.2.5 Managing the Application Portfolio

As mentioned in the previous section, the application portfolio will evolve over time. The applications and products have their life cycles and will move around the matrix over time. They need investment funding to for improvement or maintenance. The IS applications in the portfolio therefore need to be properly managed and have resources allocated according to their business importance over their life cycles. Ward and Griffiths suggest the following approaches to achieve this:

♦ Strategic

A strategic IS application is one that the company is dependent upon for future success in a competitive market where any advantage can be eroded quickly. The value of the application can be measured by its effectiveness against competitors. The followings are the suggested approaches.

- ***Continuous innovation*:** The systems need to be continuously improved to increase the value added by the systems as an integral part of the business. Improvements should be business driven in order to sustain the perceive advantage. Judging the decision to spend money should not be made only on ROI calculations but also the risk involving if the systems fail.

- ***High value added and vertical integration*:** User has to decide how the systems can add value to the business process and then have the ability to implement the needs as when required. The systems management should be vertically integrated with the business unit management to obtain maximum strategic advantage from information as a value adding resource.

- Access to new information about markets, customers, competitors, suppliers, or other external bodies, to improve competitiveness.
- Establishment of electronic links with external bodies, to speed up and improve communications, and, in some cases, to lock in trading partners.
- Access to external information, such as market research databases or database marketing facilities to gain external intelligence.
- Restructured existing information in order to meet the critical success factors of the business or its external partners.
- Capability to integrate and utilize multimedia data.
- Very fast access to integrated information so that visibility is provided from end to end of the key processes, and information-based services can be delivered effectively throughout the processes.
- Access and filtering mechanisms for unstructured information to satisfy executive information needs relating to critical business issues.
- Performance measures to monitor progress on strategic factors.
- Modeling data to perform "what if" analysis on crucial business issues.
- Better information about staff to enable more effective use of the human resource.

Source: Adapted from Ward and Griffiths (1996)

Figure C-19 Typical Strategic Information Requirement

♦ High Potential

IS high potential applications include those dealing with high degree of uncertainty of success. Many will fail, usually. Managing these kinds of IS application involves dealing effectively with the failures and not wasting money and resources. The followings are approaches to achieve this:

- ***Process R&D*:** Focus on how to make, market, distribute, resource the new product, not just discover the ultimate in product design. Many IS have failed because the organization have not implemented them appropriately.

- ***Minimal integration*****:** Risky ventures should be separated from mainline activities while being evaluated and the business should not have become dependent on them. A key part of evaluation is to decide how the integration can be best achieved.

- ***Cost control*****:** Budgeting should be considered carefully. Project evaluations must be made in order to determine whether further investment is worthwhile.

♦ Key Operational

A company expects its key operational systems to make a significant contribution to the business. This involves maintaining the systems in line with current market and business demands in the most cost-effective way.

- ***Defensive innovation*****:** Key operational systems should only be enhanced and developed in response to changes or threats resulted from a reduction of their competitive capability.

- ***High Quality*****:** Compromises on the key operational systems should be avoided if they are expected to have an extended life over which they make a significant business contribution.

- ***Effective resource utilization*****:** Key operational systems should not be allocated resources as much as given to strategic systems. This implies that the systems should share resources, supports, and expertise to reduce cost.

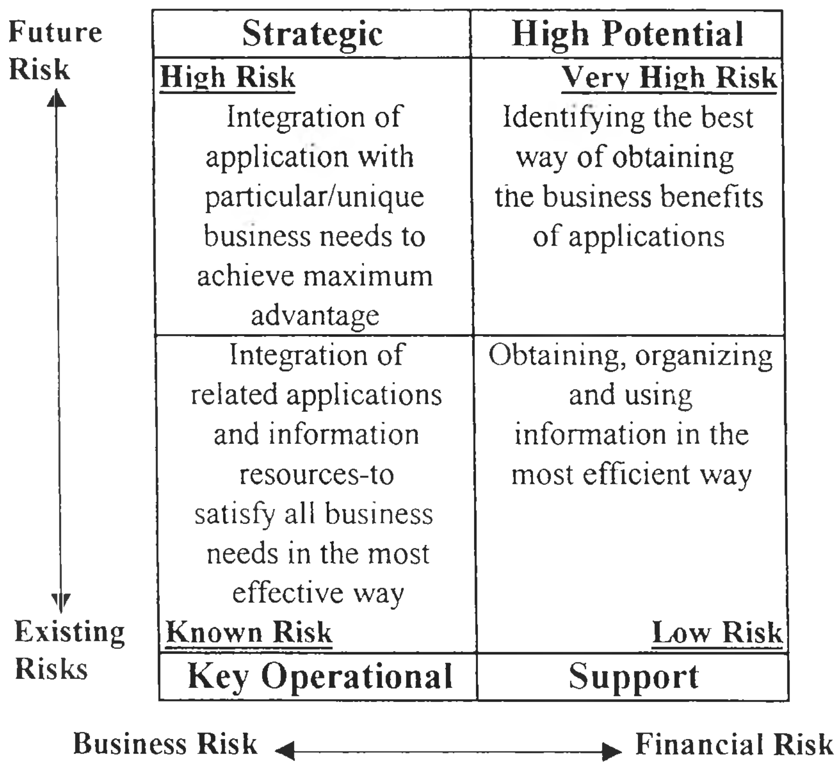
♦ Support

Support IS applications are not critical to an organization's future success unless they waste valuable resources or the market changes. The management approaches are therefore:

- ***Disinvest/rationalize*****:** An organization should rationalize the systems, which offer no competitive advantage. Many systems can be replaced by outsourcing from the other companies, so the organization's commitments to systems are reduced.

- ***Sustained quality and efficiency*****:** The quality of the system should be maintained in appropriate proportion. Generally, the system should not be enhanced unless there is a clear demonstration of economical advantage to ensure that resource is consumed where a return is certain.

Figure C-20 summarizes the critical issues in managing segments of the portfolio.



Source: Adapted from Ward and Griffiths (1996)

Figure C-20 Critical Issues in Managing segments of the Portfolio

Although criticized that it is of limited value since every company is likely to have systems in all four categories, the application portfolio still has proved effective in providing a framework to reach consensus on the portfolio of IS applications. Once the agreement has been concluded, the company can then move toward the delivery of the required portfolio. The value of the application portfolio also lies in the recognition that applications in each quadrant require different management approach. Understanding the issues raised by each segment of applications provide a direction toward planning and implementing of applications as they evolve over time. Some key issues of driving forces and critical requirements to be satisfied in the deliver of the applications are addressed in figure C-21.

Segment	Driving forces	Critical requirements
High potential	New business idea or technological opportunity Individual initiative, owned by a "product champion" Need to demonstrate the value or otherwise of the idea	Rapid evaluation of prototype and avoid wasting effort/resource on failures Understand the potential (and the economics) in relation to business strategy Identify the best way to proceed, the next step
Strategic	Market requirements, competitive pressures or other external forces Business objectives, success factors and vision of how to achieve them Obtaining an advantage and then sustaining it	Rapid development to meet the business objective, and realize benefits within the window of opportunity Flexible system that can be adapted in the future as the business evolves Link to an associated business initiative to sustain commitment
Key operational	Improving the performance of existing activities (speed, accuracy, economics) Integration of data and systems to avoid duplication, inconsistency and misinformatio Avoiding a business disadvantage or allowing a business risk to become critical	High quality, long life solutions and effective data management Balancing costs with benefits and business risks, identify the best solution Evaluation of options available by objective feasibility study
Support	Improved productivity/efficiency of specific (often localized) business tasks Legal requirements Most cost effective use of IS/IT funds and resources available	Low cost, long-term solutions, often packaged software to satisfy most needs Compromise the needs to the software available Objective cost/benefit analysis to reduce financial risk and then control costs carefully

Source: Adapted from Ward and Griffiths (1996)

Figure C-21 Some Key Issues in the Segments of the Portfolio

Ward and Griffiths conclude that the rationale behind adopting an application portfolio management concept as a core part of the IS/IT strategic management approach consists of two parts:

1. The need to use business strategic planning concepts to ensure the closest possible linkage between business and IS/IT strategy.

2. The end result of the process is inevitably a set of applications, therefore the way of producing and managing them must always be a focus of attention, before, during and after the development of a strategy.

3.2.6 Informal/Opportunistic Creative Thinking

It is also important that informal, opportunistic, or creative thinking should be brought into the application portfolio. In high potential applications, most of them are usually come from new business idea, technological opportunity or individual initiative. However, these kinds of creative ideas need to be reasonably demonstrated their value or contribution to the business and then acquire a consensus agreement before adopting them into the portfolio.

1.3 Summary

In this part, the model for strategic information systems planning has been developed. This model includes important steps needed in relating the business needs to the IS applications. It begins with the development of a business mission that constitutes of business definition, vision, goals, and company philosophies. The important issue to be considered during the development of a business mission is the stakeholders' expectation. A company should identify its own stakeholders, their interests and concerns to the business, evaluate what expectations are the most important and likely to be achieved, and then decide what to be include in the mission statement.

The next step is to develop a business strategy for the company. In doing so, the business environment that the company is operating has to be considered. Externally, there are two levels to be taken into account: macroenvironment and industry environment. From this analysis, the company should be able to identify both opportunities and threats relating to its business. After the assessment of external environment of the business, it is equally important to perform an internal audit to be able to identify the strengths and weaknesses in terms of the resources and strategic capability of the company. By considering these four factors: opportunities, threats, strengths, and weaknesses, the company can generate a set of feasible strategies that appropriately match its external opportunities and threats with internal capabilities.

After the business strategies have been identified, the next step is to determine the information that is critical to the success of these strategic goals. Critical success factors are therefore served as a linkage between the company's strategies and the information requirements. After identifying key information needs from a CSF analysis, the company can then consider possible IS applications to provide required information. Strategic option generator is the selected tool to generate IS choices using the strategic thrust concepts: differentiation, cost, innovation, growth, and alliance. During this step, the current status of information systems and technology in the industry have to be taken into account too.

Finally, following the identification of the possible strategic information systems applications from the previous part, the company needs to bring those strategic and high potential applications derived from various routes, assess them, and then classify them into 4 quadrants of the application portfolio in terms of their contribution to the business now and in the future order to ensure that they are managed success fully.

BIOGRAPHY

The author, Supakorn Sookpunya, was born in September, 16, 1974. The author was graduated from Khon Kaen University in 1996 in Mechanical Engineering. After that, the author worked at Siam-Asahi Technoglass Company as a production and maintenance engineer for about 2 years and then left the company in 1998. Since the middle of 1999, the author has studied for the Master of Engineering in Engineering Management and Master of Science in Engineering Business Management at Regional Centre for Manufacturing Systems Engineering.