

Chapter 3 Research Method

3.1 IT Capital

In this section, we give a formal definition to IT capital from the viewpoint of capital. First, we briefly introduce the definition and classification of IC. After that, we will formally define IT capital.

3.1.1 Intellectual Capital

The concept of intellectual capital (IC) first appeared in the letter which is written by Galbraith to Kaleeki, who is the editor-in-chief of the Economist Magazine, in 1969 (Masoulas, 1998). Galbraith attempted to explain the value gap between market value and book value with the concept. He considered that IC means intellectual action rather than knowledge or pure intellect and exists in the knowledge that helps firms create differential advantage and accelerate the creation of value through valuable IC to connect the working team inside or outside the enterprises, customers, and suppliers (Galbraith, 1969). It implied that IC can be seen as a form of value creation. (J. Ross, G. Ross, Dragonetti, & Edvinsson, 1998)

With the coming of knowledge-based economy and the development of IC, many researchers gradually gave IC almost the same definition and classification. Most researchers principally divide IC into human, customer, relationship, process, and innovation capital. In this research, we adopt and extend the concept of IC proposed by Edvinsson & Malone (1997) to be the basis of IT capital.

Edvinsson & Malone (1997) consider that IC is the possession of the knowledge, experience, organizational technology, customer relationships, and professional skills that provide organizations with a competitive edge in the market. They divide IC into human capital and structural capital based on whether it belongs to organizations or not and further divide structural capital into customer capital, which exists outside the organization, and organizational capital, which is created internally by organizations. Finally, they divide organizational capital into innovation capital and process capital (Figure 3.1). The following describes the definition of human, relationship, process, and innovation capital (Edvinsson & Malone, 1997).

- *Human Capital*. Human capital means all individual capabilities, knowledge, skills, and experience of employees and managers in the company. It also has to capture the dynamics of an intelligent organization in a changing competitive environment.
- *Customer Capital*. Customer capital means customer satisfaction, longevity, price sensitivity, and the financial well-being of long-term customer.

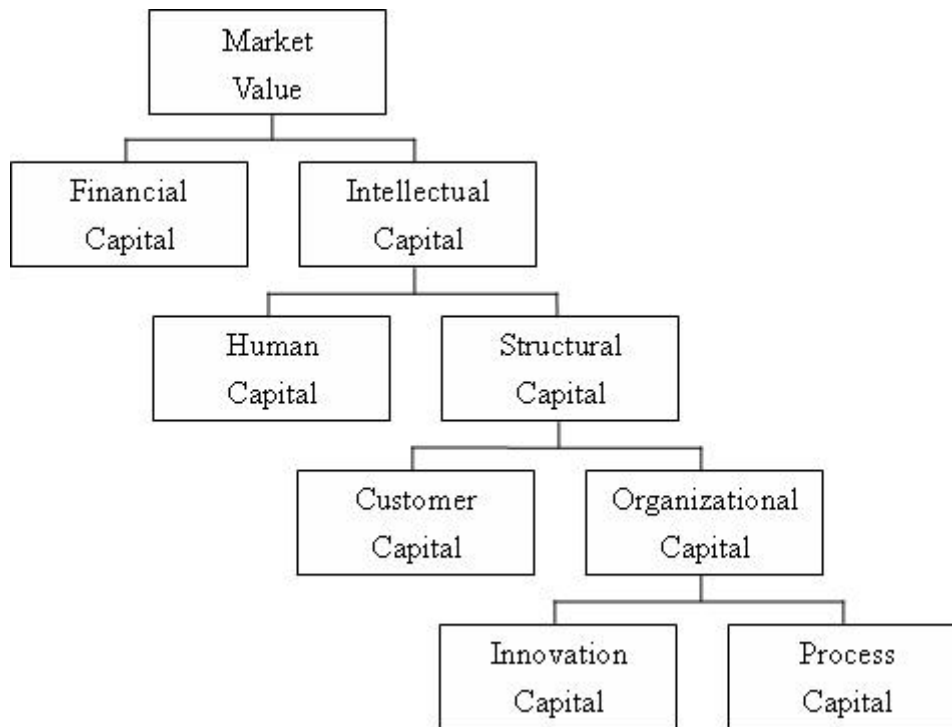


Figure 3.1 Skandia Market Value Scheme

Source: Edvinsson & Malone (1997)

- *Process Capital*. Process capital is those work processes, techniques (ISO 9000), and employee programs that augment and enhance the efficiency of manufacturing or the delivery of service. It is the kind of practical knowledge used in continuous value creation.
- *Innovation Capital*. Innovation capital refers to the renewal capability and the results of innovation in the form of protected commercial rights, intellectual property, and other intangible assets and talents used to create and rapidly bring to market new products and services.

3.1.2 IT Capital Definition

Figure 3.2 is based on Skandia Market Value Scheme (Figure 3.1) proposed by Edvinsson and Malone (1997). This research extends it to be the basis of IT Capital and considers that there is a positive inter-relationship between IT capital and each intellectual capital. The other capitals often depend on IT capital to offer a computerized environment and assist them in deal with the application of information.

When they need innovation and services, they will rely on IT, such as automation and computerization, to achieve their goals. For example, the business process, which is a quite important component within the organization, represents the procedures, steps, and the core of departments. Thus, how to improve it is always the top task that

managers and executives concern. Through the help of IT, the operating efficiency not only can be enhanced but also the competitiveness can be improved.

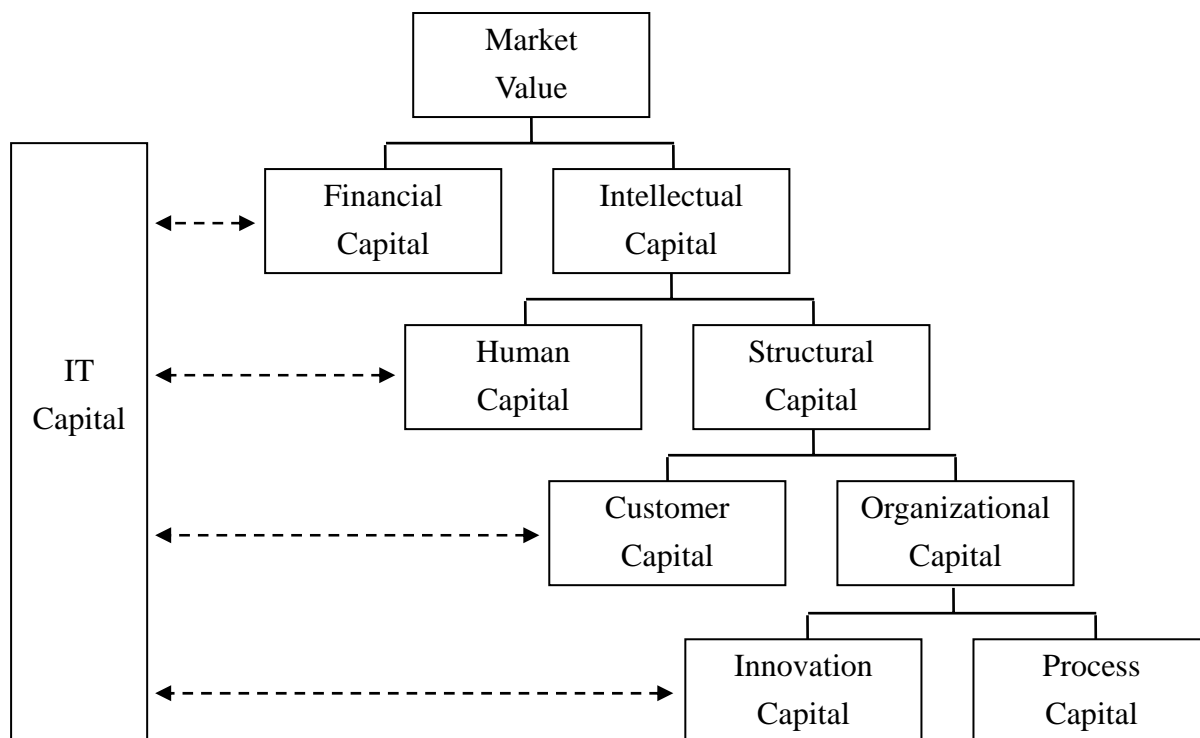


Figure 3.2 IT Capital Structure

Source: extended from Edvinsson & Malone, 1997

Given a definition to IT capital, it is IT capabilities and assets that firms accumulate over a long period of time. It can be divided into tangible and intangible assets. Tangible IT capital belongs to a portion of structural capital within the organization, such as IT infrastructure, hardware, software, network, and intellectual properties. Intangible IT capital includes the IT staffs’ capability and experience, the collaboration between end users and IT department, and the capability of IT management and investment. These are called IT capital. It also can be described from four aspects as follows.

1. Tangible IT infrastructure;
2. The capability and industrial knowledge of IT staffs;
3. The experience of cooperation between users and IT staffs, and the capability that organizations apply IT to create business model and enterprise processes;
4. The policy and procedures of IT management.

These aspects correspond not only to “Financial Performance”, “Relationship Performance”, “Process Performance”, and “Innovative Performance” of the strategic

map but also to “Structural Capital”, “Process Capital”, “Relationship Capital”, and “Human Capital” in the intellectual capital structure. In short, IT Capital is firms’ core infrastructure and also is a source of capability and value.

3.2 Research Dimensions and Indicator of IT Capital

3.2.1 Development of Dimensions and Indicators

In order to understand IT capital in the organization, this study integrates three IT assessment views described in Section 2.1, the concept of intellectual capital, and the types of information system to develop the research dimensions and performance indicators of IT capital. In the next Section 3.2.2, we will explain the relationship between theories and research dimensions and indicators of IT capital in detail. The following will describe the development of dimensions and indicators of IT capital first.

In this research, we divide IT capital into two dimensions, which are “IT Input Dimension” and “IT Output Dimension.” Based on the definition of IT capital and three IT assessment views, we subdivide IT Input dimension into five sub-dimensions, which are “IT Human Resources”, “IT Infrastructure”, “IT Application Capability”, “IT R&D Capability”, and “Organizational Structure & Culture.” As to IT Output dimension, we subdivide it into seven sub-dimensions, which are “Strategy Contribution & Decision Quality”, “Innovative Products & Services”, “Reducing Cost”, “Process Efficiency”, “Supplier/Customer Relationship”, “Knowledge Management & Organizational Learning”, and “Intellectual Property.” Besides, we develop the performance indicators based on each sub-dimension, which describes as follows. The classification of IT capital is as shown in Figure 3.3.

➤ *IT Input Dimension*

- **IT Human Resource.** We expect to evaluate the human resource of IT department. It includes three performance indicators: “IT personnel expenditures”, “The size of IT department”, and “Personnel turnover rate.”
- **IT Infrastructure.** In this dimension, we focus on the expenditures of IT infrastructure and the utility rate of IT infrastructure. It includes two performance indicators: “IT budget” and “PC/NB per person.”
- **IT Application Capability.** We expect to understand the status of IT application such as the average time of solving problems by IT department. It includes three performance indicators: “Certification items”, “IT application level”, and “Problem handling.”
- **IT R&D Capability.** We focus on R&D expenditure and the labor in the

organization. It includes two performance indicators: “R&D budget” and “The number of R&D employees.”

- **Organizational Structure & Culture.** We expect to understand the status of IT department and the organization. It includes three performance indicators: “IT department position”, “CEO background”, and “Business model.”

➤ *IT Output Dimension*

- **Strategy Contribution & Decision Quality.** We focus on the contribution of IT to strategy-making and decision quality. It includes only one performance indicator: “The contribution to business strategy and revenue.”
- **Innovative Products & Services.** We focus on the contribution of IT to innovative products and services, as well as the influence of IT on the innovation capability of organizations. It includes two performance indicators: “The innovation capability” and “The contribution to innovation.”
- **Reducing Cost.** In this dimension, we focus on the contribution and improvement of IT to cost reduction. It includes one performance indicator: “The contribution of cost reduction.”
- **Process Efficiency.** We expect to understand the contribution of IT to the efficiency of business process. It only includes one performance indicator: “The contribution to business process.”
- **Supplier/Customer Relationship.** In this dimension, we focus on the relationship of suppliers and customers with the organization. It includes two performance indicators: “The requirement of supplier/customer relationship” and “The contribution of supplier/customer relationship.”
- **Knowledge Management (KM) & Organizational Learning.** We focus on the current status of KM and organizational learning in the firm, such as the time of implementing KM. It includes two performance indicators: “Knowledge management execution” and “The contribution to knowledge management.”
- **Intellectual Property (IP).** In this dimension, we focus on the number and type of Intellectual Property. It includes only on performance indicator: “The quality and quantity of intellectual property.”

In addition, this study will use the table of Indicator Applicability Evaluation (as shown in Appendix A) to verify the validity of performance indicators. In this table, the score is given by IT managers. The detail is described in Chapter 4 and 5.

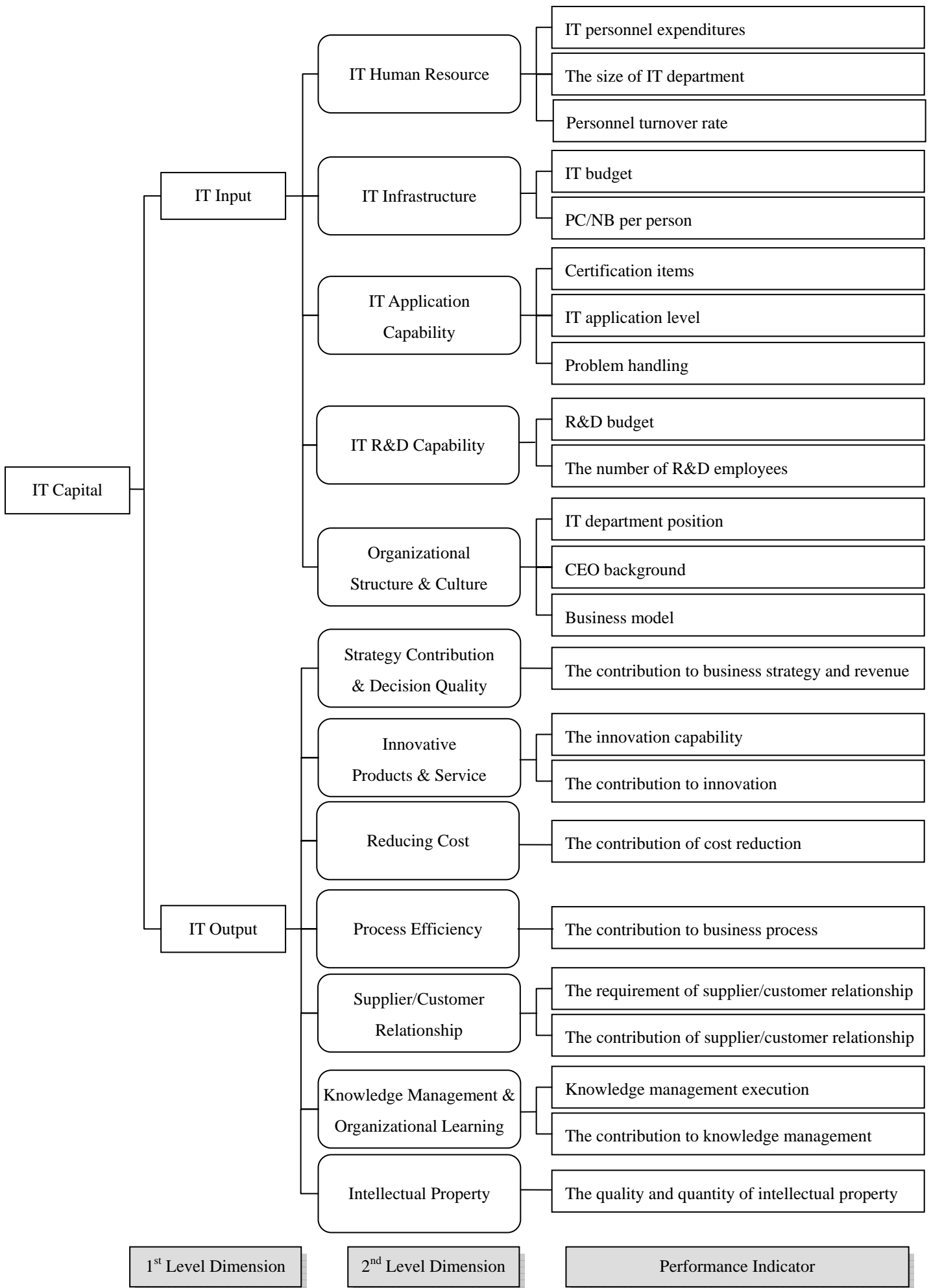


Figure 3.3 IT Capital Model

3.2.2 Relationship between Theories and Dimensions and Indicators

In this section, we will explain the relationship between theories and IT capital dimensions and indicators. In order to develop dimensions and indicators of IT capital, this study divides IT capital into two dimensions, “IT input” and “IT output”, and integrates several theories into the two dimensions respectively. In the dimension of “IT input”, dimensions and indicators are mainly developed upon the three IT assessment views. In the dimension of “IT output”, dimensions and indicators are on the basis of the research of intellectual capital and the types of information system.

➤ *Resource-oriented View of IT Assessment*

According to the resource-oriented view, IT investment is regarded as a resource rather than the expenditure when it has the attributes of uniqueness, rareness, and non-substitutability. It not only generates business value but also brings a sustained competitive advantage to the firm. It can be divided into IT assets and capability. IT assets include tangible, intangible, and human-related assets. IT capability results from the interaction and collaboration of the three IT assets. In order to develop the dimensions and indicators, we have to take IT assets (e.g. IT personnel expenditure) and capability (e.g. the ability of problem handling) into account. The dimensions and indicators based on this view include the dimension of “IT Human Resource”, “IT Infrastructure”, and “IT R&D Capability” as well as the corresponding indicators. In addition, the indicators of “Certification items” and “Problem Handling” in the dimension of “IT Application Capability” also are based on this view.

Table 3.1 Dimensions and Indications Based on Resource-oriented View

Theory	Dimensions/ Indicators
Resource-oriented view of IT assessment	<ul style="list-style-type: none"> ➤ IT Human Resources <ul style="list-style-type: none"> □ IT personnel expenditures □ The size of IT department □ Personnel turnover rate ➤ IT Infrastructure <ul style="list-style-type: none"> □ IT budget □ PC/NB per person ➤ IT Application Capability <ul style="list-style-type: none"> □ Certification items □ Problem handling ➤ IT R&D Capability <ul style="list-style-type: none"> □ R&D budget □ The number of R&D employees

➤ *Capability-oriented View of IT Assessment*

According to the capability-oriented view, IT investment can not only improve the operational efficiency (short-term benefits) but also create strategic and tactical capabilities (long-term benefits). However, the budget for IT investment with long-term benefits may always be reduced or omitted by using traditional evaluation methods. Therefore, it is very important to take any possible IT capabilities into account. The dimensions and indicators based on this view include the dimension of “Strategy Contribution and Decision Quality” and the corresponding indicators. In addition, the indicators of “IT application level” and “Problem Handling” in the dimension of “IT Application Capability” also are based on this view.

Table 3.2 Dimensions and Indications Based on Capability-oriented View

Theory	Dimensions/ Indicators
Capability-oriented View of IT assessment	<ul style="list-style-type: none"> ➤ IT Application Capability <ul style="list-style-type: none"> □ IT application level □ Problem handling ➤ Strategy Contribution and Decision Quality <ul style="list-style-type: none"> □ The contribution to business strategy and revenue

➤ *Contingency-oriented View of IT Assessment*

According to the contingency-oriented view, the benefits of IT investment would be influenced by organizational variables (e.g. the level of IT application and the size of IT budget) and external environment (e.g. industry and business model). Thus, we have to take internal and external variables into consideration and make indicators suitable to be applied to evaluate IT capital within the organization.

The dimensions and indicators based on this view include the dimension of “Organizational Structure and Culture” and the corresponding indicators. In addition, the indicator of “The size of IT department” in the dimension of “IT Human Resource”, the indicator of “IT budget” in the dimension of “IT Infrastructure”, and the indicator of “IT application level” in the dimension of “IT Application Capability” also are based on this view.

Table 3.3 Dimensions and Indications Based on Contingency-oriented View

Theory	Dimensions/ Indicators
Contingency-oriented View of IT assessment	<ul style="list-style-type: none"> ➤ IT Human Resources <ul style="list-style-type: none"> □ The size of IT department ➤ IT Infrastructure <ul style="list-style-type: none"> □ IT budget

Table 3.3 Dimensions and Indications Based on Contingency-oriented View (Cont.)

Theory	Dimensions/ Indicators
Contingency-oriented View of IT assessment	<ul style="list-style-type: none"> ➤ IT Application Capability <ul style="list-style-type: none"> □ IT application level ➤ Organizational Structure and Culture <ul style="list-style-type: none"> □ IT department position □ CEO background □ Business model

➤ *Intellectual Capital*

As described in Section 3.1.1, intellectual capital can not only explain the gap between market value and book value but also assist enterprises in understanding the importance of intangible assets. It can be divided into human, process, innovation, and customer capital. Each capital can generate benefits depending on the assistance of IT. Similarly, the benefits and contributions of IT also can be found after cooperating and interacting with each capital. Thus, we take the research of intellectual capital into account for explaining the contribution of IT in the dimension of “IT output.” The dimensions and indicators based on this research include the dimension of “IT Human Resource”, “Supplier/Customer Relationship”, “Innovative Products and Service”, “Process Efficiency”, and “Intellectual Property” and the corresponding indicators.

Table 3.4 Dimensions and Indications Based on Intellectual Capital Research

Theory	Dimensions/ Indicators
Intellectual Capital (human capital, process capital, innovation capital, and customer capital)	<ul style="list-style-type: none"> ➤ IT Human Resources <ul style="list-style-type: none"> □ IT personnel expenditures □ The size of IT department □ Personnel turnover rate ➤ Innovative Products and Services <ul style="list-style-type: none"> □ The innovation capability □ The contribution to innovation ➤ Process Efficiency <ul style="list-style-type: none"> □ The contribution to business process ➤ Supplier/Customer Relationship <ul style="list-style-type: none"> □ The requirements of supplier/customer relationship □ The contribution of supplier/customer relationship ➤ Intellectual Property <ul style="list-style-type: none"> □ The quality and quantity of intellectual property

➤ *Types of Information System*

In general, the organization can be divided into four levels, including strategic-, management-, knowledge-, and operational-level. Based on the functions, it also can be divided into five areas: sales and marketing, manufacturing, finance, accounting, and human resources. Information systems are applied to support different requirements of each level and functional area.

For example, at the strategic level, the major system is executive support system (ESS), which assists top managers in making strategies and understanding the long-term trend of the enterprises. At the management level, the major systems include management information system (MIS) and decision support system (DSS), which help middle managers control and manage the organizational operation as well as make decisions. At the knowledge level, the major systems are knowledge work system (KWS) and office automation system, which support knowledge and data worker within the organization. At the operational level, the major system is transaction processing system.

In order to make dimensions and indicators more complete and effective, we take the types of information system into account. It would help us understand the contribution of IT to different levels within the organizations. The dimensions and indicators based on this theory include the dimension of “Strategy Contribution and Decision Quality”, “Reducing Cost”, “Process Efficiency”, and “KM and Organizational Learning” as well as the corresponding indicators.

Table 3.5 Dimensions and Indications Based on Types of Information Systems

Theory	Dimensions/ Indicators
Types of Information System (strategic-level, management-level, knowledge-level, and operational-level systems)	<ul style="list-style-type: none"> ➤ Strategy Contribution and Decision Quality <ul style="list-style-type: none"> □ The contribution to business strategy and revenue ➤ Reducing Cost <ul style="list-style-type: none"> □ The contribution of cost reduction ➤ Process Efficiency <ul style="list-style-type: none"> □ The contribution to business process ➤ KM and Organizational Learning <ul style="list-style-type: none"> □ Knowledge management execution □ The contribution to knowledge management

3.3 IT Capital Questionnaire

In this research, we design a questionnaire based on research dimensions and indicators of IT capital, which are described above. It will help us and interview subjects to more understand the meaning of each performance indicator. Besides, the process of interview also will be based on the content of this questionnaire. Through the questionnaire, we can further understand the profile of IT capital in the financial industry. The following will introduce the content of each question according to the research dimensions and indicators. This questionnaire has a total of 62 questions and the detailed description of IT capital questionnaire will be as shown in Appendix B.

3.3.1 Research Dimension in the Form of Questions – IT Input

There are five sub-dimensions in the dimension of IT Input, including “IT Human Resources”, “IT Infrastructure”, “IT Application Capability”, “IT R&D Capability”, and “Organizational Structure and Culture.”

➤ *IT Human Resources*

The purpose of this dimension is to understand the current status of IT human resource in the financial service industry, such as the personnel and training expenditures of IT department.

Table 3.6 Dimension of IT Human Resources

Indicators	Questions
IT personnel expenditures	1. The total expenditures of IT department
	2. The personnel expenditures of IT department
	3. The training expenditures of IT department
The size of IT department	4. The total number of IT department staff and the ratio of the number of IT department staff to the number of all staff
	5. The average professional tenure of IT department staff
	6. The average age of IT department staff
Personnel turnover rate	7. The turnover of IT department staff

* Opened questions: 1-7

➤ *IT Infrastructure*

The purpose of this dimension is to understand the current status of IT infrastructure in the financial service industry, such as computer hardware and software expenses and IT maintenance.

Table 3.7 Dimension of IT Infrastructure

Indicators	Questions
IT budget	8. Computer hardware expenses
	9. Computer software expenses
	10. IT Maintenance fees
PC/NB per person	11. The ratio of the number of personal computers to the number of employees
	12. The ratio of the number of notebook computers to the number of employees

* Opened questions: 8-12

➤ *IT Application Capability*

The purpose of this dimension is to understand the current status of IT application capability in the financial service industry, such the ratio of jobs completed through the Internet and the average time of handling problem.

Table 3.8 Dimension of IT Application Capability

Indicators	Questions
Certification items	13. Main information systems
	14. Items which owns IT quality certification
IT application level	15. The ratio of jobs completed through the Intranet
Problem Handling	16. The average completion time of IT project
	17. The average time of handling problem by IT department

* Multiple-choice questions: 13-14; Opened questions: 15-17

➤ *IT R&D Capability*

The purpose of this dimension is to understand the current status of IT R&D capability in the financial service industry, such as the R&D budget and the number of employees in the IT R&D.

Table 3.9 Dimension of IT R&D Capability

Indicators	Questions
R&D budget	18. The sum of money of R&D expenses
The number of R&D employees	19. The number of employees which actually join in the IT R&D

* Opened questions: 18-19

➤ *Organizational Structure and Culture*

The purpose of this dimension is to understand the current status of organizational structure and culture in the financial service industry, such as the position of IT department, which is central or distributed, and what level of unit IT department is in the organization.

Table 3.10 Dimension of Organizational Structure and Culture

Indicators	Questions
IT department position	20. IT department position in the company's institutional framework
CEO background	21. Background and experience of the CEO
Business model	22. Business model in the company

* Single-choice questions: 20-21; Multiple-choice question: 22

3.3.2 Research Dimension in the Form of Questions – IT Output

There are seven sub-dimensions in the dimension of IT Output, including “Strategy Contribution and Decision Quality”, “Innovative Products and Services”, “Reducing Cost”, “Process Efficiency”, “Supplier/Customer Relationship”, “Knowledge Management and Organizational Learning”, and “Intellectual Property.”

➤ *Strategy Contribution and Decision Quality*

The purpose of this dimension is to understand the current status of strategy contribution and decision quality in the financial service industry, such as the contribution of IT to strategy making.

Table 3.11 Dimension of Strategy Contribution and Decision Quality

Indicators	Questions
The contribution to business strategy and revenue	23. The effect of the IT managers on CEO's strategy-making
	24. The effect of IT department on corporate strategy for each department
	25. The contribution and improvement of IT to strategy-making
	26. The contribution and improvement of IT to the revenue
	27. The contribution and improvement of IT to the executive's decision quality
	28. The comparison of revenue with industry peers
	29. Comparison of enhancing executive's decision quality with industry peers

* Opened questions: 25-27; Likert 6-point scale: 23-24, 28-29

➤ *Innovative Products and Services*

The purpose of this dimension is to understand the current status of innovative products and services in the financial service industry, such as the ratio of IT department staff to innovative proposals and the contribution of IT to innovative products and services.

Table 3.12 Dimension of Innovative Products and Services

Indicators	Questions
The innovation capability	30. The ratio of the number of IT department staff to the number of proposals
	31. The average number of innovative proposals from IT department
	32. The relationship between innovative proposals of IT department and IT infrastructure
	33. The relationship between innovative proposals of IT department and business model
	34. The relationship between innovative proposals of IT department and processes
The contribution to innovation	35. The relationship between innovative proposals of IT department and new products
	36. The contribution and improvement of IT to innovative products and services
	37. The comparison of innovative products and services with industry peers

* Opened questions: 30, 31, and 36; Likert 6-point scale: 32-35, 37

➤ *Reducing Cost*

The purpose of this dimension is to understand the current status of cost reduction in the financial service industry, such as the contribution of IT to reduce the cost of customer service and processes.

Table 3.13 Dimension of Reducing Cost

Indicators	Questions
The contribution of cost reduction	38. The contribution of IT to the cost reduction of processes
	39. The contribution of IT to the cost reduction of customer service
	40. The contribution and improvement of IT for reducing cost
	41. The comparison of reduced cost with industry peers

* Opened questions:40 ; Likert 6-point scale: 38-39, 41

➤ *Process Efficiency*

The purpose of this dimension is to understand the current status of process efficiency in the financial service industry, such as the contribution of IT to the process efficiency and daily operation.

Table 3.14 Dimension of Process Efficiency

Indicators	Questions
The contribution to business process	42. The contribution of IT to the process efficiency of daily operation
	43. The contribution of IT to the process efficiency of customer services
	44. The contribution of IT to the process efficiency of delivery of goods
	45. The contribution and improvement of IT to process efficiency
	46. The comparison of process efficiency with industry peers

* Opened questions: 45; Likert 6-point scale: 42-44, 46

➤ *Supplier / Customer Relationship*

The purpose of this dimension is to understand the current status of supplier and customer relationship in the financial service industry, such as the need of suppliers to IT infrastructure and the contribution and improvement of IT to supplier relationship.

Table 3.15 Dimension of Supplier/Customer Relationship

Indicators	Questions
The requirements of supplier / customer relationship	47. The requirement of suppliers for IT infrastructure
	48. The requirement of customers for IT infrastructure
The contribution of supplier / customer relationship	49. Maintaining good supplier relationship through IT
	50. Maintaining good customer relationship through IT
	51. The contribution and improvement of IT to supplier relationship
	52. The contribution and improvement of IT to customer relationship
	53. The comparison of improving supplier relationship with industry peers
	54. The comparison of improving customer relationship with industry peers

* Opened questions: 51-52; Likert 6-point scale: 47-50, 53-54

➤ *Knowledge Management (KM) and Organizational Learning*

The purpose of this dimension is to understand the current status of KM and organizational learning in the financial service industry, such as the time of implementing KM and the contribution and improvement of IT to KM and organizational learning.

Table 3.16 Dimension of Knowledge Management & Organizational Learning

Indicators	Questions
KM execution	55. The time of implementing KM
	56. Implementing knowledge raking mechanism and merging it into personnel salary and bonus
	57. The frequency of managers using KM
The contribution to KM	58. The support of CEO for KM
	59. The contribution of IT department for KM (by the manager of each department.)
	60. The contribution and improvement of IT to KM and organizational learning
	61. The comparison of building the environment of knowledge-sharing with industry peers

* Opened questions: 55 and 60; Likert 6-point scale: 56-59, 61

➤ *Intellectual Property (IP)*

The purpose of this dimension is to understand the current status of intellectual property in the financial service industry, such as patents.

Table 3.17 Dimension of Intellectual Property

Indicators	Questions
The quality and quantity of IP	62. The number and the type of IP owned by organizations

* Opened question: 62

3.4 Research Approach

3.4.1 Data Collection

This research adopts case study to be the research approach. First, we select five benchmark companies in the financial industry and then collect the primary data through the face-to-face interview for understanding the financial industry's IT capital. In the process of interview, we use the questionnaire of IT capital to assist interview

subject in understanding the implication of performance indicators more. Besides, we also gather the relevant information about case company from the Internet and other reference books to be the secondary data so as to assist in the analysis of cases. The period of interview is from May to December in 2004.

3.4.2 Research Subjects

The purpose of this research is to understand the application of IT capital and to verify the performance indicator of IT capital in the financial service industry. In order to enhance the validity of this research, we select five companies, which come out top in the financial service industry, to be the case companies and choose case companies' IT manager, chief information officer (CIO), to be the interview subject.

As a CIO, he or she has the capability of strategy planning and business understanding. He or she can cooperate with organizational strategies to invest and apply IT and make IT bring its real value into full play. In addition, he or she also would understand each department's requirement and support them to solve the problem related to the IT management. Thus it can be seen that CIO must fairly familiar with IT capital, and then he or she could properly uses it to help organizations. Therefore, the CIO will be the most suitable candidate to be the interview subject.

As shown in Table 3.18, we use the upper case "A" to "E" to represent the five companies. Besides, industrial classification, professional title of interview subject, business type of case company, and the date also are described as follows.

Table 3.18 The Introduction of Case Company and Interview Subject

Case	Industry	Professional Title	Business Type	Date
A	Banking	General Manager	Public issued company	2004/11/26
B	Property & Liability Insurance	Director of Information Technology	Public issued company	2004/12/09
C	Life Insurance	Vice General Manager & Information Manager	Foreign shares exceeding 50%	2004/12/02
D	Securities	Director of Information Technology	Listed in Stock Market	2004/11/19
E	Banking	General Manager	Public issued company	

Source: this research