5. Research Implications

5.1. A Preliminary Set of Performance Indicators

These six high-tech companies belong to computer manufacturing, computer, peripherals & software wholesale, optoelectronic materials & products industries, and semiconductor manufacturing, and respectively, are at the top rank of each industry.

Table 5.1: Cases information

Industry	Cases	Total	%
Computer Manufacturing	3	6	50.00%
Computer, Peripherals & Software Wholesale	1		16.67%
Optoelectronic Materials, Components & Products	1		16.67%
Semiconductor Manufacturing	1		16.67%

After case study interviews with IT managers, a questionnaire approach was taken to gather the scores from the IT managers to provide the validity of the indicator development.

According to the adapted scores from the IT manager of case 1, the average scores in the dimensions of IT input and IT output are 4.31 and 4.70. At the same time, for IT input, the more important indicator is “PC/NB per person,” whereas the less important one is “IT budget.” For IT output, the more important indicator is “the contribution to cost reduction,” whereas the less important one is “the contribution to knowledge management.”

Table 5.2: Scores for indicator adaptation – IT input (Case 1)

No.	Level-II	IT input indicators	Score
1	1	IT personnel expenditures	5
2	1	The size of IT department	4
3	1	Personnel turnover rate	1
4	2	IT budget	3
5	2	PC/NB per person	6
6	3	Certification items	4
7	3	IT application level	5
8	3	Problem handling	5
9	4	R&D budget	4
10	4	The number of R&D employees	4
11	5	IT department position	5
12	5	CEO background	5
13	5	Business model	5

Adaptation: high (6) ~ low (1) Mean: 4.31 / Std: 1.20

Table 5.3: Scores for indicator adaptation – IT output (Case 1)

No.	Level-II	IT output indicators	Score
1	1	The contribution to business strategy and revenue	5
2	2	The innovation capability	4
3	2	The contribution to innovation	5
4	3	The contribution to cost reduction	6
5	4	The contribution to business process	5
6	5	The requirements of supplier/customer relationship	5
7	5	The contribution to supplier/customer relationship	5
8	6	Knowledge management execution	4
9	6	The contribution to knowledge management	4
10	7	The quality and quantity of intellectual property	4

Adaptation: high (6) ~ low (1) Mean: 4.70 / Std: 0.61

According to the adapted scores of case 2, the average scores in the dimensions of IT input and IT output are 4.00 and 4.60. At the same time, for IT input, the scores show no significant difference between each indicator. For IT output, the more important indicator is “the contribution to cost reduction,” whereas the less important indicators are “the contribution to knowledge management” and “the contribution to innovation.”

Table 5.4: Scores for indicator adaptation – IT input (Case 2)

No.	Level-II	IT input indicators	Score
1	1	IT personnel expenditures	4
2	1	The size of IT department	4
3	1	Personnel turnover rate	4
4	2	IT budget	4
5	2	PC/NB per person	4
6	3	Certification items	4
7	3	IT application level	4
8	3	Problem handling	4
9	4	R&D budget	4
10	4	The number of R&D employees	4
11	5	IT department position	4
12	5	CEO background	4
13	5	Business model	4

Adaptation: high (6) ~ low (1) Mean: 4.00 / Std: 0.00

Table 5.5: Scores for indicator adaptation – IT output (Case 2)

No.	Level-II	IT output indicators	Score
1	1	The contribution to business strategy and revenue	5
2	2	The innovation capability	5
3	2	The contribution to innovation	4
4	3	The contribution to cost reduction	5
5	4	The contribution to business process	6
6	5	The requirements of supplier/customer relationship	4
7	5	The contribution to supplier/customer relationship	5
8	6	Knowledge management execution	4
9	6	The contribution to knowledge management	4
10	7	The quality and quantity of intellectual property	4

Adaptation: high (6) ~ low (1) Mean: 4.60 / Std: 0.63

According to the adapted scores of case 3, the average scores in the dimensions of IT input and IT output are 4.62 and 5.70. At the same time, for IT input, the more important indicators are “IT personnel expenditures,” “IT budget,” “IT application level,” and “trouble-shooting,” whereas the less important indicators are “R&D budget,” “CEO background,” and “business model.” For IT output, the scores show that almost all indicators are important for them.

Table 5.6: Scores for indicator adaptation – IT input (Case 3)

No.	Level-II	IT input indicators	Score
1	1	IT personnel expenditures	6
2	1	The size of IT department	6
3	1	Personnel turnover rate	6
4	2	IT budget	6
5	2	PC/NB per person	6
6	3	Certification items	3
7	3	IT application level	6
8	3	Problem handling	6
9	4	R&D budget	3
10	4	The number of R&D employees	3
11	5	IT department position	3
12	5	CEO background	3
13	5	Business model	3

Adaptation: high (6) ~ low (1) Mean: 4.62 / Std: 1.50

Table 5.7: Scores for indicator adaptation – IT output (Case 3)

No.	Level-II	IT output indicators	Score
1	1	The contribution to business strategy and revenue	6
2	2	The innovation capability	6
3	2	The contribution to innovation	6
4	3	The contribution to cost reduction	6
5	4	The contribution to business process	6
6	5	The requirements of supplier/customer relationship	6
7	5	The contribution to supplier/customer relationship	6
8	6	Knowledge management execution	6
9	6	The contribution to knowledge management	6
10	7	The quality and quantity of intellectual property	3

Adaptation: high (6) ~ low (1) Mean: 5.70 / Std: 0.86

According to the adapted scores of case 4, the average scores in the dimensions of IT input and IT output are 5.08 and 4.70. At the same time, for IT input, the more important indicators are “IT budget” and “IT application level,” whereas the less important indicator is “business model.” For IT output, the more important indicator is “the contribution to business process,” whereas the less important indicators are “the contribution to business strategy and revenue” and “the contribution to knowledge management.”

Table 5.8: Scores for indicator adaptation – IT input (Case 4)

No.	Level-II	IT input indicators	Score
1	1	IT personnel expenditures	5
2	1	The size of IT department	5
3	1	Personnel turnover rate	4
4	2	IT budget	6
5	2	PC/NB per person	6
6	3	Certification items	5
7	3	IT application level	6
8	3	Problem handling	5
9	4	R&D budget	5
10	4	The number of R&D employees	5
11	5	IT department position	5
12	5	CEO background	4
13	5	Business model	5

Adaptation: high (6) ~ low (1) Mean: 5.08 / Std: 0.62

Table 5.9: Scores for indicator adaptation – IT output (Case 4)

No.	Level-II	IT output indicators	Score
1	1	The contribution to business strategy and revenue	4
2	2	The innovation capability	4
3	2	The contribution to innovation	5
4	3	The contribution to cost reduction	5
5	4	The contribution to business process	6
6	5	The requirements of supplier/customer relationship	5
7	5	The contribution to supplier/customer relationship	5
8	6	Knowledge management execution	4
9	6	The contribution to knowledge management	5
10	7	The quality and quantity of intellectual property	4

Adaptation: high (6) ~ low (1) Mean: 4.70 / Std: 0.61

According to the adapted scores of case 5, the average scores in the dimensions of IT input and IT output are 4.15 and 4.50. At the same time, for IT input, the more important indicators are “IT application level” and “trouble-shooting,” whereas the less important indicators are “R&D budget” and “CEO background.” For IT output, the more important indicators are “the contribution to business process” and “the contribution to cost reduction,” whereas the less important indicator is “the contribution to business strategy and revenue.”

Table 5.10: Scores for indicator adaptation – IT input (Case 5)

No.	Level-II	IT input indicators	Score
1	1	IT personnel expenditures	4
2	1	The size of IT department	4
3	1	Personnel turnover rate	4
4	2	IT budget	4
5	2	PC/NB per person	4
6	3	Certification items	4
7	3	IT application level	6
8	3	Problem handling	6
9	4	R&D budget	3
10	4	The number of R&D employees	4
11	5	IT department position	4
12	5	CEO background	2
13	5	Business model	5

Adaptation: high (6) ~ low (1) Mean: 4.15 / Std: 1.03

Table 5.11: Scores for indicator adaptation – IT output (Case 5)

No.	Level-II	IT output indicators	Score
1	1	The contribution to business strategy and revenue	3
2	2	The innovation capability	4
3	2	The contribution to innovation	4
4	3	The contribution to cost reduction	6
5	4	The contribution to business process	6
6	5	The requirements of supplier/customer relationship	4
7	5	The contribution to supplier/customer relationship	5
8	6	Knowledge management execution	5
9	6	The contribution to knowledge management	4
10	7	The quality and quantity of intellectual property	4

Adaptation: high (6) ~ low (1) Mean: 4.50 / Std: 0.88

According to the adapted scores of case 6, the average scores in the dimensions of IT input and IT output are 5.15 and 4.70. At the same time, for IT input, the more important indicators are “IT budget,” “IT application level,” and “trouble-shooting,” whereas the less important indicator is “certification items.” For IT output, the more important indicators are “the contribution to business process” and “the contribution to cost reduction,” whereas the less important indicator is “the contribution to knowledge management.”

Table 5.12: Scores for indicator adaptation – IT input (Case 6)

No.	Level-II	IT input indicators	Score
1	1	IT personnel expenditures	5
2	1	The size of IT department	5
3	1	Personnel turnover rate	5
4	2	IT budget	6
5	2	PC/NB per person	6
6	3	Certification items	3
7	3	IT application level	6
8	3	Problem handling	6
9	4	R&D budget	5
10	4	The number of R&D employees	5
11	5	IT department position	5
12	5	CEO background	5
13	5	Business model	5

Adaptation: high (6) ~ low (1) Mean: 5.15 / Std: 0.77

Table 5.13: Scores for indicator adaptation – IT output (Case 6)

No.	Level-II	IT output indicators	Score
1	1	The contribution to business strategy and revenue	5
2	2	The innovation capability	5
3	2	The contribution to innovation	5
4	3	The contribution to cost reduction	6
5	4	The contribution to business process	6
6	5	The requirements of supplier/customer relationship	5
7	5	The contribution to supplier/customer relationship	5
8	6	Knowledge management execution	4
9	6	The contribution to knowledge management	4
10	7	The quality and quantity of intellectual property	2

Adaptation: high (6) ~ low (1) Mean: 4.70 / Std: 1.05

The total average scores in the dimensions of IT input and IT output of six cases are 4.55 and 4.82. In IT input, the scores above the average are case 3, 4 and 6. In IT output, the score above the average is only case 3.

In the total rank of IT input indicators, the top three are “IT application level,” “trouble-shooting,” and “PC/NB per person,” whereas the last are “certification items” and “CEO background.” In the total rank of IT output indicators, the top three are “the contribution to business process,” “the contribution to cost reduction,” and “the contribution to supplier/customer relationship,” whereas the last is “the quality and quantity of intellectual property.”

In the rank of IT input, the first indicator is “IT application level.” Because the IT department is considered as a support unit in the high-tech industry, they have to try their best to apply IT ability. The second is “trouble-shooting,” since it is the bound duty of the IT department to handle the problem for the factories and production lines. The third is “PC/NB per person.” In the high-tech industry, they not only respect the information technology but take the tools of IT seriously. Due to the requirement of firms’ support for the human resources of IT departments, the fourth is “IT personnel expenditures.” In addition, the fifth is “IT budget.” Because development or deployment of new systems is almost entirely based on the firm’s IT infrastructure, the IT budget for computer hardware and software is considered important, too. The last one is “CEO background.” In the manufacturing industry, the IT department is regarded as the role of aides and staff, so they think that it is not significant to use the indicator of CEO background.

Table 5.14: Rank of IT capital performance indicators – IT input

Rank	Level-II	IT capital performance indicators	Mean	Std
1	3	IT application level	5.50	0.76
2	3	Problem handling	5.33	0.75
3	2	PC/NB per person	5.33	0.94
4	1	IT Personnel expenditures	4.83	0.69
5	2	IT budget	4.83	1.21
6	1	The size of IT department	4.67	0.75
7	5	Business model	4.50	0.76
8	5	IT department position	4.33	0.75
9	4	The number of R&D employees	4.17	0.69
10	4	R&D budget	4.00	0.82
11	1	Personnel turnover rate	4.00	1.53
12	3	Certification items	3.83	0.69
13	5	CEO background	3.83	1.07

Table 5.15: Rank of IT capital performance indicators – IT output

Rank	Level-II	IT capital performance indicators	Mean	Std
1	4	The contribution to business process	5.83	0.37
2	3	The contribution to cost reduction	5.67	0.47
3	5	The contribution to supplier/customer relationship	5.17	0.37
4	5	The requirements of supplier / customer relationship	4.83	0.69
5	2	The contribution to innovation	4.83	0.69
6	2	The innovation capability	4.67	0.75
7	1	The contribution to business strategy and revenue	4.67	0.94
8	6	The contribution to knowledge management	4.50	0.76
9	6	Knowledge management execution	4.50	0.76
10	7	The quality and quantity of intellectual property	3.50	0.76

In the rank of IT output, the first indicator is “the contribution to business process.” Because, in the high-tech industry, not only the maintenance of factories and production lines, but also the management of business processes has to be automated or computerized. The second is “the contribution to cost reduction,” since the main purpose of automation and computerization is to lower the costs. By means of saving human resources and reducing the rate of incorrect data, they can achieve the goal of cost reduction. The third is “the contribution to supplier/customer relationship.” As the cases are all in the top ten companies in Taiwan’s electronics industry, they have to face the international customers. These customers have higher requirements for

their OEM or ODM. Therefore, the cases need a higher level of e-business and transparency of information flow to satisfy them. In this respect, IT has contributed very much to the promotion of supplier/customer relationship. The last indicator is "the quality and quantity of intellectual property." The service inside the company is the main work of the IT department, so it is not important to get more patents, trademarks, or copyrights. In the IT department, the quality and quantity of intellectual property has less help for the company. Furthermore, the company also does not request the IT department to get these.

During the interviews with the CIO or the IT department executive of these case companies, we found that the role of the IT department has some differences between the companies. In case 1, they act between the roles of strategy and aides and staff. In case 2, they act as the role of aides and staff. In case 3, they act as the role of strategy. In case 4, they act as the role of aides and staff. In case 5, they act as the role of aides and staff. At the present, the IT department of case 5 is continuously transforming distributed structure into centralized structure. In case 6, they act as the role of strategy. The foundation of case 6 is the strongest one among these cases.

On the role of strategy, they will focus on the proportion of the budget, IT infrastructure, the supplier/customer relationship, and the contribution to innovation. However, on the role of aides and staff, they will focus on the PC/NB per person, IT application level, the contribution to cost reduction, and the contribution to business process.

5.2. Differences in Indicators between Cases

- IT Input - A.1. IT Human Resources

In the dimension of IT human resources, case 2, 4 and 6 were more similar in the cases. Their average professional tenures of IT staff were all over five years and more senior than other cases; Their average ages of IT department staff were all between 31 and 33; Their turnovers of IT department staff were all between 8% and 10%; In addition, their scores for indicator adaptation were all nearly the average score, so their opinions for this dimension were approximately the same. The only difference was less number in IT department of case 2, but they were still similar to compare the proportion of the company's total employees.

On the other hand, case 1 and 5 were more similar in the cases. Their average professional tenures of IT staff were both about three years, and they also took the distribution of IT staff resources seriously. The difference was higher turnover of IT staff, 20%, of case 5. It was because that case 5 is going through the organization merging and reorganizing in recent years; therefore, the company's personnel was

changed a lot. At last, case 3 was not similar to others and had the highest score for the indicator adaptation.

Table 5.16 : Differences in dimension of 'IT Human Resources'

IT capital dimensions	Case	1	2	3	4	5	6
A.1. IT Human Resources		○	□	◇	□	○	□

(The similar cases use the same sign)

- IT Input - A.2. IT Infrastructure

In the dimension of IT infrastructure, case 1 and 6 were more similar in the cases. Their hardware and maintenance expenses were nearly equal. It was obvious that they had already constructed plenty of IT systems, so they had a large proportion of maintenance cost. Their ratios of PCs to employees were both over 100%, and the ratios of notebooks to employees were both about 50%. Thus, these case companies had IT tool popularized to be used by their staffs. The difference was less software expense of case 6. Maybe it is because that the case 6 company had developed and completed the software environment for a longer time.

On the other hand, case 2, 4 and 5 were more similar in the cases. Their proportions of IT hardware and software budget were between 2:1 and 3:1. Their maintenance expenses were obviously less. Their ratios of PCs to employees were only about 50%. Perhaps a part of their staffs would not use computer directly, such as some employees of production line. At last, case 3 still had the highest score for the indicator adaptation.

Table 5.17: Differences in dimension of 'IT Infrastructure'

IT capital dimensions	Case	1	2	3	4	5	6
A.2. IT Infrastructure		○	□	◇	□	□	○

(The similar cases use the same sign)

- IT Input - A.3. IT Application Capability

In the dimension of IT application capability, all of the cases were similar. Every company in high-tech industry took various information systems to support business requirement. Their certification items did not have too much. Their ratios of jobs completed through the Internet were all very high and over 70%. Their IT projects were mostly completed within 1 to 6 months. They all paid attention to the ability of problem handling, and over 90% problems could be dealt within a day twenty-four hours. It is because that the companies in high-tech industry all would pay attention to the capability of IT application to support the operational business process.

Table 5.18: Differences in dimension of 'IT Application Capability'

IT capital dimensions	Case	1	2	3	4	5	6
A.3. IT Application Capability		○	○	○	○	○	○

(The similar cases use the same sign)

- IT Input - A.4. IT R&D Capability

In the dimension of IT R&D capability, case 1, 4 and 6 were more similar in the cases. They regarded IT R&D as important part and invested many people in the IT R&D. Their scores for the indicator adaptation were all higher than other cases.

On the other hand, case 2 and 3 were more similar, and their employees invested in IT R&D were apparently less. At last, the strategy of case 5 was more different, and the company trained a R&D group in China to deal the whole company's research and development.

Table 5.19: Differences in dimension of 'IT R&D Capability'

IT capital dimensions	Case	1	2	3	4	5	6
A.4. IT R&D Capability		○	□	□	○	◇	○

(The similar cases use the same sign)

- IT Input - A.5. Organizational Structure and Culture

In the dimension of organizational structure and culture, IT departments in all cases were first level centralized unit, and their business models were B2B primarily to take large international companies' orders. Depending on the role of the IT department, case 1, 3 and 6 were the role of strategy, and their IT department actively initiated IT projects and found out the company's requirement. However, IT departments in case 2, 4 and 5 were the role of aides and staff. They were mainly supporting operational business to cooperate other organizational functions.

Table 5.20: Differences in dimension of 'Organizational Structure and Culture'

IT capital dimensions	Case	1	2	3	4	5	6
A.5. Organizational Structure and Culture		○	□	○	□	□	○

(The similar cases use the same sign)

- IT Output - B.1. Strategy Contribution and Decision Quality

In the dimension of strategy contribution and decision quality, case 2, 4 and 5 were more similar in the cases. They think that the IT contribution to strategy and revenue is not very remarkable. Their IT contributions were mainly providing services for other company's departments, assisting in system integration after organization

merged, and supporting production lines' operation and factories' development for the environment changing.

On the other hand, case 1, 3 and 6 were more similar in the cases, and they paid more attention to the IT driving force. They think that IT could lead organization to initiate IT projects, enable enterprise to develop new product and service, and generate the differential value. IT makes things happen such as the changes of new products, new services and new business processes. This is very helpful to the enterprise transforming.

Table 5.21: Differences in dimension of 'Strategy Contribution and Decision Quality'

IT capital dimensions	Case	1	2	3	4	5	6
B.1. Strategy Contribution and Decision Quality		○	□	○	□	□	○

(The similar cases use the same sign)

- IT Output - B.2. Innovative Products and Services

In the dimension of innovative products and services, case 1, 4 and 5 were more similar in the cases. Their innovative proposals from IT department were more than others. They all considered that their innovative products and services were better than other competitors. Their innovative capability could help them to keep on the leading position when industry environment changes or enterprise transforms.

On the other hand, case 2 and 3 were more similar in the cases. Although the innovative proposals from IT department were less, they still recognized the importance of innovation. IT could create the competitive advantage and new distinctive value after integrating business model and process. At last, case 6 already had a standard procedure to encourage, implement and manage the internal innovations. The company had developed the mechanism for innovation for a period of time.

Table 5.22: Differences in dimension of 'Innovative Products and Services'

IT capital dimensions	Case	1	2	3	4	5	6
B.2. Innovative Products and Services		○	□	□	○	○	◇

(The similar cases use the same sign)

- IT Output - B.3. Reducing Cost

In the dimension of reducing cost, all of the cases were similar. They all considered that IT was a great contribution to reducing cost. IT could accelerate the automation and computerization, strengthen the products and services, reduce the complexity of processes, and decrease the mistake of the information. All of them think that IT department's object focuses on the cost at present. According to the logical conversion and calculation, the companies could measure the benefit of

reducing cost to determine the cost-effective of IT investment and avoid the waste. For the indicator adaptation, all of them also gave the higher scores to this dimension.

The difference is that case 1 and 4 did not have a standard procedure to calculate the contribution to reducing cost. Probably their industry's environment changes quickly, and the cases were hard to develop a mechanism to measure. Nevertheless, they still agreed the IT contribution to reducing cost.

Table 5.23: Differences in dimension of 'Reducing Cost'

IT capital dimensions	Case	1	2	3	4	5	6
B.3. Reducing Cost		○	○	○	○	○	○

(The similar cases use the same sign)

- IT Output - B.4. Process Efficiency

In the dimension of process efficiency, case 2, 3, 4, 5 and 6 were more similar in the cases. IT could reduce the complexity of processes, improve the process duration, and predict the supplies and sells accurately. To optimize the business process, IT is essential to success. For the internal support, IT assisted company in manufacturing and seamless productive automation. IT provided correct, accurate, transparent, direct and effective information to help the planning, simulation and arrangement of the production lines. If without IT, they would need to do more preparation and overestimate the resource of human, material and finance. Therefore, IT decreased the uncertain factor of information. For the external support, IT assisted company in forecasting supply chain and customer's orders to improve the enterprise's competitiveness. In addition, case 6 noted a situation of this dimension. When IT improves business process, the cost uncertain will be reduced. Possibly, the environmental demand changes, so that they need to alter the procedure again or to keep the competitiveness.

On the other hand, case 1 considered that the main contribution is on the external processes. Because of the strategy of brand focusing, the company is more different than other cases. However, the case still agreed the great contribution of IT to deal the procedure of orders.

Table 5.24: Differences in dimension of 'Process Efficiency'

IT capital dimensions	Case	1	2	3	4	5	6
B.4. Process Efficiency		○	□	□	□	□	□

(The similar cases use the same sign)

- IT Output - B.5. Supplier/Customer Relationship

In the dimension of supplier/customer relationship, case 1, 2, 3, 5 and 6 were more similar in the cases. All of them think that IT helps company to transfer

information to the external processes. Based on the flexible and associative SCM system, they could join and complete the complicated B2B process. Because of the different requirements from the international enterprises, the cases must have enough IT ability to satisfy customers' demands. If IT could help the company to construct an efficient business process with suppliers/customers, it will be a valuable improvement to the competitiveness.

On the other hand, case 4 considered that the internal support of IT is more important than the external. The company made manufacturing, not marketing, a priority, and paid attention to the internal support.

Table 5.25: Differences in dimension of 'Supplier/Customer Relationship'

IT capital dimensions	Case	1	2	3	4	5	6
B.5. Supplier/Customer Relationship		○	○	○	□	○	○

(The similar cases use the same sign)

- IT Output - B.6. Knowledge Management and Organizational Learning

In the dimension of knowledge management and organizational learning, case 1, 2, 4, 5 and 6 were more similar in the cases. These case companies did not give the adaptation scores very high. However, they acknowledge the importance of knowledge management. It involves use of the file database, adds the mechanism of sifting, and cooperates with management and their applications so that personnel, knowledge and experience may be preserved within the organization. In addition, they have to accumulate the professional abilities on ordinary days and enhance the new technology and knowledge constantly.

The results are not the same in the companies to implement knowledge management. How to use KM by the user is just a key point. The attentions by the other departments' managers are important too. At last, case 3 was not similar to others and had the higher score for the indicator adaptation.

Table 5.26: Differences in dimension of 'KM and Organizational Learning'

IT capital dimensions	Case	1	2	3	4	5	6
B.6. KM and Organizational Learning		○	○	□	○	○	○

(The similar cases use the same sign)

- IT Output - B.7. Intellectual Property

In the dimension of intellectual property, case 1, 2, 4 and 5 were more similar in the cases. They did not give the adaptation scores very high. Case 3 and 6, however, gave lower scores to this dimension. Although some cases had a lot of intellectual properties, all of them considered that the quality and quantity of intellectual properties could not express all of the intangible IT abilities.

Table 5.27: Differences in dimension of ‘Intellectual Property’

IT capital dimensions	Case	1	2	3	4	5	6
B.7. Intellectual Property		○	○	□	○	○	□

(The similar cases use the same sign)

5.3. The Implications of IT Capital

By the functions of operation automation, supporting decision making, application for competitive strategy, and corporation reengineering, IT brings countless business opportunities and benefits to enterprise. Nowadays, the revolution and innovation of IT capability have transformed the enterprise’s business model and management completely.

However, these successes did not seem to make an impact on productivity figures. On the recent researches, we were unable to have the obvious relation between IT investment and enterprise’s performance. If IT investments do not yield any clear advantages, why do so many organizations continue to invest heavily in IT? The suggestion that IT does not bring benefits to organizations seems to go against intuition and common sense.

Therefore, the question of IT productivity paradox for managers is not whether IT pays off in general but what IT applications should be deployed in their respective organizations. The managers must reconsider the nature of the company and the source of creation value. For the issue, this research has several implications as well as the contributions as follows:

1. Because enterprises have not managed the intellectual capital well, the performance has not increased.

For a long time, measuring the true value of enterprises has been the issue that investor, researcher and administrator have paid attention to all the time. The intangible assets have not been listed on the balance sheet in the past, but the success of the enterprise management was closely relative to the intangible assets. Have a lot of company be aware of its existence and importance. They have begun to develop, manage, assess and protect companies’ intangible intellectual capital actively.

Therefore, the difference between IT success and failure may be the ability to evaluate the benefits and strategic potential versus the cost and risks of proposed IT investments, and having the right management processes in place to plan and execute IT projects.

2. The type of IT is more and more like a kind of capital, and we have to assess not only the tangible but the intangible assets.

From the indicators of this research, we could find that more than half of the

indicators measured the intangible part of IT. It is because IT has more and more like a type of capital and become a kind of intangible intellectual capital. The general methods to assess tangible assets have already no longer suitable to use at present. We must measure the IT value based on the capital-oriented view to get the completed understanding.

IT investment is unable to relate with enterprise's performance directly. However, the indicators of this research show that IT value actually exists in various kinds of intellectual capital of enterprise. IT more or less supports each intellectual capital's development, such as the influence of IT improvement in process capital. As a result, IT investment is relative with enterprise's performance through the intellectual capital. The managers must develop the ability of intellectual capital assessment and management to maximize the influence of IT investment on the corporation performance.

3. This research has constructed IT capital indicators and dimensions and made the cases to score the adaptation.

The research has developed and verified the set of performance indicators for IT capital by the six cases. At last, a questionnaire approach was taken to gather the scores from the IT managers to provide the validity of the indicator development. According to the average scores for the adaptation, most indicators of this research were appropriate to use. In other words, the IT capital performance indicator could measure the case companies effectively and be worth to study and test further.

4. The capital-oriented view has become a new developing direction of IT assessment issue.

Based on the capital-oriented view, when assessing IT value, not only tangible but intangible assets would be measured. This viewpoint comprehends resource-oriented, capability-oriented and management-oriented views. Therefore, it would not ignore the invisible IT ability of company, make a mistake to evaluate the tangible assets, and be regardless of the internal and external enterprise environment. In addition, it is more comprehensive for capital-oriented view to integrate the theories of the classical information management functions and intellectual capital researches. Based on the capital-oriented view, we could have the broad and advanced measurement indicators and dimensions for IT assessment.