Project Management Practices in IT outsourcing: An investigation into a commercial bank in Taiwan

A study submitted in partial fulfillment of the requirements for the degree of Master of Science in Information Management at THE UNIVERSITY OF SHEFFIELD

By

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ABSTRACT

Outsourcing relationship is an important issue in outsourcing business. In order to make information technology (IT) outsourcing project success, the client and vendor firms should deal with the pre-contract and post-contract management cautiously. Besides, the change requirements management is also a major matter in IT project. In outsourcing project, change requirements are generally the source of the conflicts to the relationship. Thus, this research aims to investigate the outsourcing relationship administration, change requirements management, and the change requirements management in outsourcing project.

In this dissertation, literature studies and qualitative methodology is applied to better reinforce the research validity. One hand, various literatures of these two subjects are studied to construct the theoretical foundation for the following empirical research. The study of outsourcing relationship includes vendor issues, tangible and intangible contracts subjects, and relationship administrative approach. While, literature research of the change requirements management contains the company and project level administration and change causes and impacts. Further, the change requirements management in outsourcing project is also studied.

On the other hand, the research interview is conducted to collect data from the case company employees. Through the case study, how the outsourcing relationship and change requirements managed in banking industry in Taiwan is explored. After the comparative analysis on the research findings, the results are displayed depending on the framework of literature studies.
After the comparative analysis on the literature study and case study, the arguments from the literature and the findings of the case company are addressed. Based on the convincing results, it expects that outsourcing relationship and change requirements in Taiwan’s banking industry could be managed better.
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1 Introduction

The dissertation aims to investigate the project management practices in information technology (IT) outsourcing in Taiwan’s banking industry. Here, the project management practices will focus on outsourcing relationship management and user requirement change administration. These key points will be studied from critical literature researches, and then examined for empirical research in the case study.

1.1 Research Motivation

The outsourcing is defined by Nam et al., (1996, p 36) as “Outsourcing is the contracting of various systems to outside information systems (IS) vendors.” In general, outsourcing relationship is established by the contract initially. Based on it, the client and vendor firms could have the same expectations for the outcomes. However, there are few outsourcing project completed on budget, schedule, and by the quality standards. A recent survey reported by National Public Radio (Korry, 2003) quoted a staggering 78 percent outsourcing failure rate. In addition, just few companies achieved the predictable benefits from outsourcing. McIvor (2000, p. 24) suggested that “only 5 percent of company surveyed achieved significant benefits.” Therefore, how to maintain the outsourcing relationship after the post-contract period is an importation issue.

Moreover, change requirements management is a critical issue in project management. It is also a factor to impact the IT outsourcing project success or not. Wiegers (2003, p 328) has pointed out that “uncontrolled change is a common source of project chaos,
schedule slips, and quality problems, especially on multisite and outsourced
development projects.” In fact, requirement changes normally are the causes of the
conflicts between the client and vendor firms. If the changes requirements not
controlled well, it may influence the outsourcing relationship as well. Thus, it is also
essential to investigate the change requirements management. Due to these barriers to
the project management, it is essential to explore and investigate these two areas
in-dept.

1.2 Background in Taiwan’s Banking Industry

Nowadays, IT outsourcing is a tendency in various industries. According to IT
services offered by specialized vendors, enterprises could concentrate on their own
business and raise the competitive advantages. In the professional-conscious age, IT
outsourcing will probably continue thriving in the future.

In Taiwan’s banking industry, IT outsourcing is increasingly universal because of the
internal and external environment influences. The internal cause is that the banks are
merged together as never before because of the financial innovative policy. Regarding
the external environment, the banks have to face with the competition from foreign
banks which possess global resources and high business quality. In order to overcome
the challenges, most banks have outsourced the IT business in support of cost
reduction and better customer service (Lin, 2001).

In Taiwan, banks tend to collaborate with overseas vendors because of the shortage of
IT professionals. Thus, to identify and maintain the outsourcing relationship has
become a critical issue. Additionally, how to cope with the user change requirement is also a key factor in outsourcing project management. For a comprehensive understanding of outsourcing project success, it is proper to review the literatures of outsourcing relationship management and change requirements administration.

1.3 Research Aims and Objectives

The aims for this dissertation are to investigate the outsourcing relationship administration and change requirements management in Taiwan’s banking industry. The research has built several research objectives to guide an investigation of the practices in outsourcing relationship management and requirement change administration from organizational behavior knowledge.

- To address the normal outsourcing type chosen by banking industry in Taiwan.
- To investigate how the relationship between client and vendor can be established and managed.
- To address the formal policies and procedure for requirement change management.
- To investigate the change requirements management in outsourcing project.

1.4 Structure of the Dissertation

The dissertation is structured through the research questions and objectives. In fact, the outsourcing should be managed from the organization made the related strategies. In addition, the outsourcing relationship should be administrated after the outsourcing
objectives confirmed because organization has to consider the vendor type at this moment. In this dissertation, there are three critical parts as literature review, methodology, and the results presentation of the case study. While, the details are described as follows.

Firstly, the background of the research will be introduced in Chapter 1. The IT outsourcing in Taiwan’s banking industry will be described. The, the research aim expressed by the broken questions and a set of particular objectives will be listed. Lastly, the structure outline will be presented to provide readers a whole view to this dissertation.

In Chapter 2, outsourcing relationship is defined, and the outsourcing relationship theories are introduced. Then, the types of outsourcing relationship are presented depending upon the theories. Regarding the vendor issues, the vendor styles, vendor selection criteria and procedure will be explored. Following this, outsourcing relationship building and structuring is expressed, including tangible and intangible outsourcing contracts. Finally, the outsourcing relationship management in relation to administrative processes and vendor’s performance measurement are displayed.

In Chapter 3, requirements management and related major elements are exhibited. Then, in the company level, change requirement strategy, containing policy and tool are presented. Afterwards, change requirements causes and impact are displayed. In the end, change requirements management in IT outsourcing project is disclosed.

In Chapter 4, the research methodology will be described. The research approach and
strategy and case study method will be outlined. Following, the research design will be disclosed, which contains the background of the case company, data collection, sample composition, and data analysis.

In Chapter 5, the IT department situations in the case organization are expressed clearly in order to present the data analysis clearly in the next chapter. Firstly, the IT organization structure is displayed by diagram, and then the project roles are described. Afterwards, the system developing life cycle is also showed by diagram, and general outsourcing situation is revealed.

In Chapter 6, the results of data analysis are presented by the literature study structures. Under the two subjects of outsourcing relationship and change requirements management, the interview results are organized as the components of the frameworks.

In Chapter 7, the section aims to discuss the major research findings through comparing the literature review and case study. These discussions will validate these findings and lastly provide the convincing results.

In Chapter 8, the final component will conclude the overall research. Additionally, research constraints in this dissertation are also summarized. Based on these constraints, the recommendations for the further research are also addressed in the end.
2 Outsourcing Relationship

The chapter aims to carry out the literature researches about Information Technology (IT) outsourcing relationship theories and practices, including relationship structuring and administration. IT outsourcing is a business exchange model existed in the working specialization environment. Pati and Desai (2005, p 281) have defined IT outsourcing as that “the transfer of an organization’s staff, IT infrastructure, processes, applications, and other IT-related activities to an external entity that possesses the capability to provide such service.” In fact, organization could estimate to outsource partial information system (IS) or the whole IT department. There are four types of IT sourcing as: (1) Insourcing; (2) Selective sourcing; (3) Strategic alliance sourcing; and (4) Outsourcing (Currie, 2000).

The success of an IT outsourcing arrangement depends significantly on the success of the outsourcing relationship. Linder and Cantrell (2002) have indicated that “As the scope of (business process outsourcing) explodes, relationships are the key to creating value in an expanding universe.” Based on the research of outsourcing relationship from Waheed and Molla (2004), the investigator have found that the level of congruency between a client’s and vendor’s objectives and values, coordination and system control, processes, capacities and information and technology are likely to influence outsourcing outcomes.

The organization of the chapter is as follows. First section briefly reviews two outsourcing relationship theories: social exchange theory and social contract theory. Based on the theories, the types of outsourcing relationship are expressed. In
outsourcing relationship, vendor has played an important role. Hence, the vendor issues, including vendor types, selection criteria and procedure are presented in the second section. Then, the third section exhibits the outsourcing relationship building and structuring, containing tangible and intangible outsourcing contracts. Finally, the outsourcing relationship management about processes and vendor’s performance measurement are displayed.

2.1 Outsourcing Relationship Theories

From some literatures, the scholars have integrated the both theoretical concepts of social exchange theory and social contract theory to explain the characteristics of the outsourcing relationship. Regarding the social exchange theory, Gottschalk and Solli-Sather (2006, p 202) have revealed that

“Each party in an exchange relationship available compares the social and economic outcomes from these interactions to those that are available from exchange alternatives, which determines their dependence on the exchange relationship.”

Additionally, Kern and Willcocks (2000, pp 326-327) have presented that “voluntary transactions involving transfer of resources between two or more individuals, i.e. actors for mutual benefit.” Positive social and economic products over time raise the partner’s trust of each other and assurance to maintaining the exchange relationship (Lambe et al., 2000). The major constructs that impacts the relationship quality are reciprocity, interdependence, power, and cohesion (Emerson, 1972).

On the other hand, social contract exchange mainly focuses on an agreement on rights
and obligations from collaboration for all parties. Heide and John (1992, pp 32) have presented that “consequently, exchanges between parties to a relationship are shaped and administrated by a set of norms, or expectations about behavior that are shared between exchange partners and that are intended to strengthen the relationship as a whole.” The character of a contract is displayed by Kern and Willcocks (2000) based on Macneil (1974, 1978, and 1980) to indicate that there are four principles as specialization of labor exchange, choice, and awareness of the future. It means that the specialization of labors have become reliant on exchanges with others for products and services. The choice represents that individuals and firms have the freedom to choose in a range of exchanges.

Applying these two theories in outsourcing relationship, Kern and Willcocks (2000) have argued that “combined these two theories not only address the recurrence of exchanges, the legal, and economic issues, but also the social behavioral dimensions that arise with the operationalisation of the contract.”

### 2.1.1 The Types of Outsourcing Relationship

Gottschalk and Solli-Sather (2006) have proposed four models which display the development of an outsourcing relationship. According to the management theories, the recent situation in outsourcing relationship is in terms of three specific phases.
Figure 1. Critical issues in each stage of maturity in outsourcing relationships (Source: Maturity model for IT outsourcing relationships, 2006).

- **Cost stage**

Based on social contract theory, cost saving and benefit maximization are the chief points in the stage. Even there are additional costs hidden in exchange between outsourcing company and the third party, the transaction costs could be controlled at accepted level. Moreover, parties’ rights, duties, and responsibilities should be formulated in an outsourcing contract in order to avoid opportunistic behavior. In detail, an outsourcing contract should address the specification of products and services, the schedule of delivery, and the customer payment detail.

- **Resource stage**

In the second stage, the outsourcing relationship between client and vendor is
complementary. One hand, a customer company could access to the external resources in the vendor organization. On the other hand, vendor makes organizational resources available to the customer on demand.

In order to provide the suitable resources, the vendor should not only possess technical competence but also understand the customer’s business and have the capability of managing customer relationship. Afterwards, it could assist in generating innovation which strengthens the long-term competitive strength of the client.

- Partnership stage

Derived from social exchange theory, the outsourcing relationship has developed as an alliance which emphasizes the collaboration between firms to attain mutually compatible goals. Criteria are an essential component in outsourcing partnership which lists stewardship behavior, and aims to boost the welfare outsourcing relationship as a whole. From social exchange’s perspective, the phase increases the partners’ trust of each other and promise to preserving the exchange relationship.

Regarding the maturity outsourcing model, Gottschalk P. and Solli-Sather H. (2006) has suggested “performance measures develop beyond cost minimization and operational efficiency into business productivity and technology innovation, and further into business benefits and achievement of mutual goals for client and vendor.”

2.2 Outsourcing Vendor Issues

Vendor has played an important role in outsourcing relationship. An appropriate
vendor can not only develop high-quality IS effectively, but also support the IT strategies making. In the segment, the investigator will study literatures about vendor types, vendor selection criteria, and selection procedure.

2.2.1 Vendor Types

Outsourcing suppliers are divided into several types depended on the IT technology and services offered. The types contain (1) IT consultants or solutions vendors. The kind vendor has business orientation and processes outsourcing with for high value activities; (2) Systems houses, which could supply software packages and usually have long term cooperation with customers, e.g. EDS; (3) hardware providers that have also taken responsibility for operations or network management; (4) ex-IT departments, which possesses perpendicular industry skills, focusing on operational level; (5) generic outsourcers, who concentrate on establishing support service. It is an optional type in IT outsourcing (Michell and Fitzgerald, 1997). Another type is IT specialist suppliers, which provide the IT developers who are familiar with the specific computer language or developing environment.

From the geographic viewpoints, there are three types as onsite, offshore, and onsite/offshore. Lim et al. (2007, p 8) have disclosed onsite outsourcing as that “mandates a governance structure under which all processes, starting with data/information gathering and ending with the delivery of specified products/services, are carried out at the client’s premises.” Concerning the offshore outsourcing, the IT activities connected with an outsourcing arrangement is moved to an offshore site under the control of the vendor (Khan et al. 2002; Morstead and Blount 2003). In Onsite/Offshore Model, the outsourcing work is distributed between the client’s onsite
location and the vendor’s offshore development center and thereby the client gains the benefits of both outsourcing types.

2.2.2 Vendor Selection Criteria

Regarding the outsourcing vendor selection, McFarlan and Nolan (1995) have suggested several criteria as:

- Vendor could keep long-term financial steadiness.
- Vendor could continue to have a technological advantageous position in terms of hardware, software developing abilities and employees.
- Vendor could solve problems rapidly through shared information and approaches.
- Vendor could possess a compatible administration culture and style.

“The choice of outsourcing candidates is no longer made on a cost-cutting basis. Other factors like non-core business competency, expensive technological updates, and being in line with corporate strategy play an important role in determining outsourcing candidates”, said Zhu et al. (2001) in Management Decision.

2.2.3 Vendor Selection Procedure

Outsourcing vendor selection is a negotiating procedure. The executive should follow systemic standards in order to choose an appropriate vendor to ensure the IT outsourcing projects success. Melymuka (2002) has suggested the vendor selection procedure as:

1. Confirming the requirements. Before outsourcing relationship established, the customer should confirm the project scope firstly.
2. Selecting and organizing a team. Besides the technical employees, the organization should include end users and staff from business development, finance, vendor relations, training, and law departments, says Colleen Mahoney, director of vendor relations for information resources at Marriott International Inc.

3. Building a strategy. The business strategy focuses on how utilize the IT development to raise the competitive advantages, for example, developing an e-tool for staff to work more effective.

4. Writing a request for proposals (RFP). According to the activity, the team members are forced to consider the feasibility and priority of the requirements.

5. Focusing on total cost of ownership. The outsourcing budget should be estimated as the total payments, not just the initial payment of each department.

6. Developing the negotiation strategy in parallel with the REP. This means that the customer would like to be upfront and to negotiate the vendor to produce the specifications depending on the requirements firstly. Then, the team members could ensure the IT development worked in concert with the requirements.

7. Considering the value of relationships as the revaluation. This indicates that customer should remember to feature the value of the relationship into the equation, containing the value of incumbency.

8. Keeping the options open. The negotiation should include the concerns of all the team members from different departments.

9. Understanding the cost structure of the vendor. Then, the customer could expect the reasonable prices and services levels.

10. Dealing with the contract process. After the previous steps completed, the customer and vendor could deal with the contract, which records the requirements, specification, prices, and other responsibilities and benefits.
Anticipating the future. The customer could negotiate to add the stipulations about
the system maintenance and other extended issues.

2.3 Outsourcing Relationship Building and Structuring

Outsourcing relationships are established by tangible and intangible approaches. The
tangible method means the outsourcing contract built and signed by client and vendor
companies. While, building a trust outsourcing relationship is an intangible method.
The details of these two aspects are explained as follows.

2.3.1 Tangible Outsourcing Contract

Outsourcing contract is the foundation of the relationship between client and vendor.
Both of the two sides should stipulate the particular aims, which is met by the client
and develops systems in order to monitor these goals all over the relationship (The
Los Angeles Times, 2002). Basically, the contract should be identified by both
organizations as fair and equally beneficial.

Regarding the contract contents, following a frame model leads client and vendor to
formulate the outsourcing contract more straightforwardly. Platz and Temponi (2007)
have pointed out the key elements as performance elements, financial elements,
human resource elements, and legal elements.

2.3.1.1 Performance Elements

- Performance incentives and penalties
The service level agreement (SLA) is the predetermined performance standards, which focus on accomplishment of minimum standards with maximizing profits while defining details of quality, quantity, timing, and method of release requested from both organizations to support the outsourced practice (Sadler, 2002). For example, concerning the elements of information quality, such as response time, accuracy of information, reliability, and quality of support services should be identified according to the information system functions being outsourced. SLAs should be connected to the measurements for examining the vendor’s performance. Hence, it is a critical evidence for customer to determine rewards or penalties.

- Communication and confidentiality

The contract should create the channels of communications and the appropriate reports and information to be exchanged between employees and parties. Furthermore, both parties should define the confidential level for the diverse information. Then, the senior executive could control the cost, quality, and schedule of the outsourcing project.

2.3.1.2 Financial elements

Both of the client and vendor companies could evaluate the direct and indirect costs. The direct costs will be charged directly to the contract, and the indirect costs will be laid into the cost pools to be allotted in the future (Worthington, 1992). Besides the costs of products, the training, product planning, modifications, new purchases, and other rearrangements depending on the outsourcing arrangement should be also estimated the prices within the contract. Based on the basic costing principles, pricing
and the terms of payment should be stated in the outsourcing contract.

2.3.1.3 Human Resource elements

The outsourcing contract should address the issues regarding the staff transformation. In detail, the arrangement must also contain all stipulations for the hiring, training, and compensation of vendor film staff to ensure that quality of employees is demanded in a systematic mode.

2.3.1.4 Legal elements

- Transfer of assets and intellectual property rights
  Platz and Temponi (2007, p. 1662) have indicated that “terms of ownership of current assets, usage of new and current assets, and transfer of ownership for assets should be addressed within the outsourcing contract.” Moreover, software licensing approvals and defense of intellectual property should be also identified.

- Warranty and liability
  Appropriate documentation and evidence of warranty should be requested by the outsourcing contract to protect the client corporation and eventually the end users from any issues regarding quality of the products and services.

2.3.1.5 Terms for Disengaging

It is necessary that outsourcing contract should provide a framework for termination
the relationship between the client and vendor parties. The termination settlement should be paid fairly between the client and vendor companies. The transfer of assets and staff should also be returned. Nondisclosure agreements are essential to protect the both sides from using any proprietary knowledge in future endeavors (Fitzpatrick and DiLullo, 2005).

2.3.2 Intangible Outsourcing Contract

There are other factors that are important to establish and maintain the outsourcing relationship, such as trust and knowledge sharing. Dyer and Chu (2000, p 259) have identified trust as “one party’s confidence that the other party in the exchange relationship will not exploit its vulnerability.” Trust is a critical feature to achieve outsourcing success. It assists the outsourcing client and vendor in developing long-term relationship and focusing on long-term strategic objectives. Nguyen et al., (2006, pp 625 - 626) have stated some factors to build trust as:

1. **Cultural understanding**

Perkins (2003, p 46) has stated that “adapting to the rigorous processes required by an outsourcer may be difficult in some corporate cultures.” The culture means the business ethos, norms, and belief as well as the working procedure.

2. **Capabilities and Creditability**

The capabilities at least refer to technology, human resource, and project management. Vendor could proof these capabilities through pilot project performance. The creditable vendor could gain good reference from existing clients or international certification such as capability maturity model (CMMI) and ISO.
3. **Personal visits**

Before the relationship established, the potential client could observe the vendor’s working follow and conditions via visiting the vendor’s application development. In contrast, after the contract built, the administrator of the vendor company could resolve some conflicts by communication in regular visiting.

4. **Investment**

The investment refers to the staff training, trustworthy infrastructure, and procedure improvement that could develop higher quality software.

After the outsourcing relationship established, the major factors to maintain the trust relationship are communication, cultural understanding, capabilities, contract conformance, and quality of delivered product (Nguyen et al., 2006).

Moreover, knowledge sharing is another critical factor to establish outsourcing relationship. Johansson (2003) has pointed out that “if the outsourcer is to be seen as a more flexible and more responsive partner, the outsourcer needs to have a lot of knowledge about the organization.” Knowledge sharing is a two-way process. Nuccio (2002) has stated as:

“The provider will offer expertise and best practices in customer service, technology and cost management. The client brings subject matter expertise, company culture and industry experience. The two joined together in a symbiotic relationship will lead to a successful venture.”
2.4 Outsourcing Relationship Management

In practice, there are some barriers to keep high-quality outsourcing relationship. For example, poor organizational communications between top management and IT employees, cross functional political problems, unclear expectations of client, uncertainties associated with the stability of the service firms, the issue of confidentiality, security and time schedules, and lack of flexibility and so on (Elmuti and Kathawala, 2000). Therefore, outsourcing relationship management has played a critical role. Afterwards, the administrative processes and vendor’s performance measurement are formulated under the topic.

2.4.1 Relationship Management Processes

Goles and Chin (2005, pp 56-57) have indicated that there are five methods to maintain the outsourcing relationship as follows.

1. Communication

Communication is an approach to share information efficiently. The information flow should be processed by regular changes of operational information to contain exchanges of requirements, needs, and resources that will impact the future of the relationship (Heide and John, 1992; Klepper, 1995). This constant exchange of information also assists in evading conflicts and obtaining satisfaction (Kern, 1997; Willcocks and Kern, 1998).

2. Conflict resolution

Conflict in an outsourcing agreement is particularly challenging, given the
complication of technology, the detail aspects in contracts, and the sometimes unequal goals of the films (Goles and Chin, 2005, p56). The advantages of positive conflict resolution include more efficient communication between both parties, an opportunity to learn from previous experience, and the potential to improve the productivity and efficiency (Anderson and Narus, 1990; Dwyer et al., 1987; Fontenot and Wilson, 1997).

3. **Coordination**

Coordination is a method to cope with the changing business and IT environments by outsourcing client and vendor. Coordination concentrates on administrating interdependencies amongst different organizational entities in one organization (Nurmi, Hallikainen, and Rossi, 2005).

4. **Cooperation**

Cooperation is a process including planning and performance. It is defined as the undertaking of corresponding activities by parties in an inter-reliant relationship with the purpose of achieving mutual benefits (Anderson and Narus, 1990).

5. **Integration**

Goles and Chin (2005, p57) have defined that “integration is intertwining various attributes and processes of the relationship into each party’s structure, policies, and procedures.” Furthermore, integration could enhance the quality of business processes of individual organization and both client and vendor companies (Henderson, 1990).
2.4.2 Vendor’s Performance Measurement

Regarding vendor’s performance measurement, customer satisfaction is an important target. Lee and Kim (1999) have expressed that user satisfaction could be analyzed into the reliability, relevancy, timeless, accuracy, currency and completeness of information from the viewpoint of the users and end clients of the IT products and services. Basically, these items could be measured by SLAs stipulated within the outsourcing contract. Furthermore, Girst and Schleyer (2005) have suggested evaluating the vendor’s performance by quality, timeless, innovation, exception handling, reliability, improvement, quantity, and customer satisfaction.

2.5 Chapter Summary

The outsourcing relationship has studied through the social exchange and contract theories. Based on some theories and outsourcing development, Gottschalk and Solli-Sather (2006) have presented that there are three types of outsourcing relationship as cost, resource, and partnership stages.

Before the outsourcing relationship constructed, vendor selection is a critical process. It is important that an organization should choose a proper vendor depending on its IT requirements. Based on the providing service, the five types of vendor are presented by Michell and Fitzgerald (1997) as IT consultants, system houses, hardware providers, ex-IT departments, and generic outsourcers. Afterwards, the probable vendor selection criteria and procedure are suggested.

Regarding the outsourcing relationship building, the tangible outsourcing contract
should contain four major aspects as performance, financial, human resource, and legal elements (Platz and Temponi, 2007). On the other hand, the intangible outsourcing contract means the trust and knowledge sharing.

In the end, a proper managing method is the way to maintain the outsourcing relationship. The process includes communication, conflict resolution, coordination, cooperation, and integration. Moreover, vendor’s performance measurement is an important issue in outsourcing relationship management. Overall, user’s satisfaction and SLAs are the major approaches to evaluate the outsourcing project outcomes.
3 Requirements Management

The purpose of the chapter is to study the literatures about the requirements management. In particular, the research will focus on change requirements management more. Additionally, in the final section of the chapter, how the change requirements management applied in IT outsourcing project will be introduced as well.

In software developing project, requirements could be seen as a system attribute and described as how the system should operate. Young (2004, pp 1-2) has identified as “A requirement is a necessary attribute in a system, a statement that identifies a capability, characteristic, or quality factor of a system in order for it to have value and utility to a customer or user.” Because requirements and quality are associated, it is important to gather accurate and relevant requirements, and then the effective system tests could be processed to meet the SLAs and user needs (Ballou, 2006). In general, requirements are divided into two types as functional and non-functional requirements. The functional requirements are also called as user requirements whereas the non-functional requirements are indicated as system requirements.

In order to handle and control requirements, the requirements engineering has been developed as a subject. Zave (1997, pp 315) has presented the identification of requirements engineering:

“Requirements engineering is the branch of software engineering concerned with the real-world goals for, functions of, and constraints on software systems. It is also
concerned with the relationship of these factors to precise specifications of software behavior, and to their evolution over time and across software families.”

In fact, the scope of the topic is extensively, containing requirements feasibility, elicitation and analysis, specification, and validation. In addition, requirements management is also included in the subject.

The organization of the chapter is structured as following. Firstly, the research will exhibit the requirements management and related major elements. Secondly, based on company level, change requirement strategy, containing policy and tool will be revealed. Then, change requirements causes and impact will be displayed. Lastly, change requirements management in IT outsourcing project will be disclosed.

3.1 Requirements Management

Requirements management is one part of requirements engineering. In fact, the matters of requirements management are displayed as a constant and cross-phase process that starts from requirements management planning and carries on through activities of identification, traceability, and change management throughout and after requirements management progression sections (Parviainen et al., 2003, p13). Basically, the requirements engineering process also supports to employ changes to requirements. Saeed (2004, pp 23-24) has provided the definition of requirements management:

“Requirements management ensures that iterative changes are managed during the project life cycle, considering the overall quality of the project. Requirements
managements has a strong connection with quality management in ascertaining what the customer wants (quality). To get high quality in the final product measures are used. Requirements management strongly connected to change management and one core entity of requirement management is requirement change management.”

Following diagram displays the main activities of requirements management. In order to deal with the inevitable situation, organization has to establish requirements management planning to manage the changes. Moreover, once the guidelines built, employees could follow it to handle the risks leaded from the change requirements in software project.

Figure 2. Main matters of requirements management. (Source: Parviainen et al., 2003).

3.1.1 Requirements Management Planning

From the company level’s perspective, requirements management planning is the necessary task. In essence, the planning should establish the standards for each phase
of requirements management and set the major roles and the related responsibilities in requirements management. However, it is impractical that the total general policies are appropriate for every project in an organization. The manager of each project should estimate the applicability and choose and maybe amend related ones for the project according to the practical experiences.

![Diagram of Tailoring General Requirements Management Policies](image)

**Figure 3.** Tailoring general requirements management policies for projects. (Source: Parviainen et al., 2003).

### 3.1.2. Requirement Identification

This activity concentrates on assigning the unique definition and explanation for each requirement. From the requirements management’s perspective, besides the original matter, requirement identification includes to clearly designate the change requirements from the requirement baseline. In the stage, it is necessary to control the requirements versions. Moreover, it is better to manage the complex information of
requirements through the attributes, such as classification, priority, status, and so on (Leffingwell and Widrig, 2000). This is a method to structure requirements and identify the relationship between requirements clearly.

3.1.3. Requirements Traceability

Requirements traceability is a critical section of requirements management, which leads requirements to be managed efficiently. According to requirements traceability, developers could ensure that the software is developed followed by users’ expectations. Traceability is an essential tool for developers to certify that all effort is spent on the development requested for the project result (Tvete, 1999).

In addition, requirements traceability could be utilized to track the relationship between the requirements and evaluate the influence of a change to detect relevant aspects which will be impacted. Sommerville (2007, pp 163 - 164) presents three types of traceability information that may be maintained:

1. Source traceability information links the requirements to the stakeholders and to the rationale for these requirements.

2. Requirement traceability information links dependent requirements within the requirements document.

Design traceability information links the requirements to the design modules where the requirements are implemented.

3.1.4. Requirement Change Management

Sommerville (2004, p 165) has demonstrated that “the process of change management is a workflow process whose stages can be defined and information flow between
these stages partially automated.” In a software developing project, it is normal that requirement changes have been proposed during developing cycle. Therefore, an appropriate requirements change management process in the organization not only enhances the organizational processes but also makes sure success and predictability of projects (Emam, Holtje, and Madhavji, 1997; Wing, Shankaraman, and Saward 1999). In fact, it is a process of approving change via constant requirements elicitation, re-estimation of risk, and assessment of systems in its working environment.

The three principal phases are intended by Sommerville (2007, pp 165 – 166):

1. Problem analysis and change specification.
   In this stage, the problem or change proposal will be validated and the related proposal will be produced.

2. Change analysis and costing.
   The consequence of the proposed change is analyzed utilizing the traceability information and universal knowledge of the system requirements. Additionally, the cost of processing the change is evaluated. In the end of the stage, the decision of approving or rejecting the change will be made.

3. Change requirements implementation.
   Once the proposed change has been approved, the requirements document, where the system design and implementation are amended.

Besides a proper workflow process, change requirements management is also a process of facilitating communication of the requirements among different stakeholders (Nuseibeh and Easterbrook, 2000). In order to process an effective communication, requirements documented could assist project members in validating,
analyzing, and tracing requirements. Thus, the version control of requirements paper is also necessary in requirements change management, and this task could be performed by requirement management tool.

### 3.2 Change Requirements Management Strategy

From the company level, establishing the strategy of requirements management can support the project managers to manage the changing requirements effectively and efficiently.

#### 3.2.1 Change Requirements Management Policy

Moreover, some policies have been suggested to improve the performance of requirements change management (Lee and Pena-Mora, 2005).

1. Employing a coordination procedure between application developers and users. This leads the changes to be processed more effective and provides a guide for people who lack of the experience of dealing with the requirements change.
2. Implementing a mechanism that helps project manager to define hidden changes, such as the collaborative meeting.
3. A flexible control policy can be more efficient in coping with the unexpected work spill over resulted from requirements change that usual overtime.

Regarding the requirements change rule, Wiegers (2003, p 332) has suggested the change-control policy statements as:

- All requirements changes shall follow the process. If a change request is not submitted in accordance with this process, if will not be considered.
• No design or implementation work other than feasibility exploration shall be performed on unapproved changes.

• Simply requesting a change does not guarantee that it will be made. The project’s change control board (CCB) will decide which changes to implement.

• The contents of the change database shall be visible to all project stakeholders.

• The original text of a change request shall not be modified or deleted.

• Impact analysis shall be performed by every change.

• Every incorporated requirement change shall be traceable to an approved change request.

The rationale behind every approval or rejection of a change request shall be recorded.

3.2.2 Change Requirements Management Tool

Besides the strategy and policy, tool can support project manager to control the requirements change more efficient. In general, organization should select appropriate tool depend of a variety of aspects (Sommerville and Suawyer, 1997):

• The new tool can compatible with the existing systems

• Tool and training budget

• The size of the system being extended

• Stability of the tool offering corporations

A typical requirements management tool is based on database to collect the system requirements and supply a variety of services to access the data about the
requirements (Kotonya and Sommerville, 1998). In detail, Lormans et al. (2004, pp 2-3) have suggested that a proper requirements management tool should have features as 1) a browser to support navigation in the set of requirements; 2) a query system; 3) a traceability support system; 4) a report generator; 5) an interface to external documentation; 6) a change control system; 7) a version control system; 8) an analysis system; 9) an access control system to manage the authorities of users; 10) a modularization support system to support grouping of requirements.

3.3 Change Requirements Causes and Impact

During the software development lifecycle, requirements change is inevitable. The causes of requirements change are diversity. Cadle and Yeates (2001, p 188) have indicated that changes may result from:

- Changes are produced in the business environment in order to compete against new products or services by competitors.
- New stakeholders with different opinion join the customer organization.
- Changes are occurred during comprehensive requirements analysis.
- Suggestions are provided by the software development team because of the performance or other issues.
- New technology is available, which provides more effective system solution.
- New or revised legislation imposes further responsibilities on the customers.

Moreover, system developers may be asked to enhance some particular functions, such as transaction security.

- A straightforward change by the users concerning what they actually want. This may results from missing a requirement or defining a defect.
In addition, the organizational strategy is also a cause of requirements change. When the strategic priorities modified, it will prompt changes to project requirements.

In fact, user requirement change has become a risk to cost, time, and quality. Facing with the exception, the engineers have to repeat the developing process, such as system analysis again, re-coding, and test case re-building and re-test. This leads to the higher cost, longer time of software development, and the lower application quality. In addition, changing requirements may impact other system modules and business objectives. Thus, system developers have to test not only the new programs in the project, but also the impacted old programs in order to ensure the current business activities can be processed normally. Hence, poor requirement change management administration could cause not only project failures but also business loss (Ramzan and Ikram, 2005).

In order to ensure the project success, the manager has to evaluate the impact of requirements change. Strems and Sugden (1996) had suggested the steps as follows.

- Identify the factors which are the causes of change.
- Identify those requirements which are highly affected by the change.
- Identify the consequences of those changes impact analysis.
- Perform change analysis on other requirements, design, cost, schedule, safety, performance, reliability, maintainability, adoptability, size and human factors.
- Decide and manage changes.
3.4 Requirements Management in IT Outsourcing

The requirements management in IT outsourcing project is more difficult, especially in offshore outsourcing. Limited by the physical distance, misunderstanding of requirements could result from inappropriate and insufficient communication, cultural differences, and interpreting the same concepts by different terminologies (Wadia and Sauter, 2003).

Facing with these problems, Goo and Nam (2007) have suggested that “contractual components should contain future demand management plan, anticipated change plan, innovation plan, and feedback plan.” Regarding the requirements management systems, it should emphasis on special factors in IT outsourcing projects as 1) change management; 2) quality assurance; 3) issue tracking; 4) testing report; 5) status reporting; 6) flexible modularization (Lormans et al., 2004, pp 4-5).

Besides the contract and tool issues, there are some suggestions from Wadia and Sauter (2003) to strengthen requirements management in IT outsourcing relationship.

- Training project members in soft skills, such as trust, cultural compatible, communication, collaboration, context sharing, knowledge management, etc.
- Work standardization is mandatory so that project members could understand how tasks should be executed.
- Frequent meetings with project members geographically distant are critical to track progress.
- Effective communication tools, like electronic mail and conference calls, are should used to translate client requirements, especially in the change
3.5 Chapter Summary

From the above literature review, there are four elements of requirements management, including planning, identification, traceability, and change management. The requirements management planning contains company and project levels. This means that although there are company strategies for requirements management, the project manager should adjust the practical activities for specific situations.

The study of change requirement strategies has focused on policies and tool selection. The policies could be established for requirements management and/or requirement change-control. The policies could be seen as a standard that lead IT project to process the requirements management more effective and efficient. Additionally, the requirements management tool selection criteria are suggested. Besides the financial concern, the top management should select proper tools compatible with the existing systems. The typical features of tool are also detailed.

Facing with the change requirements, it is important that project manager to evaluate the causes and impact. Then, the project risks and related solutions could be estimated. The causes of change requirements are mainly resulted from business environment changed, legal issue, and conflicts found by system analysis. Then, the major impacts of the change requirements are cost, quality, and schedule of the IT project.

Finally, the requirements management applied in IT outsourcing project is studied.
The topic is researched from the key points of contract, tool, and managing process. Stipulating the clauses about dealing change requirements details could resolve the conflicts in the future. Concerning the requirements management tools, the specific features are suggested for outsourcing project. Additionally, the managing process has emphasized on communication and training in order to overcome the barrier of misunderstanding the requirements.
4 Research Methodology

Avison and Fitzgerald (2003, p4) have presented the methodology as “a collection of procedures, techniques, tools, and documents aids that allow researchers to plan, manage, control, and evaluate entire research projects.” In the dissertation, the research methodology is the qualitative method in particular case study approach.

The chapter firstly outlines the research approach, strategy and case study method. Then, the chapter describes the research design including background of the case company introduction, data collection technique, sample composition, and data analysis will be elaborated.

4.1 Research Approach and Strategy

Flick (2006, p11) has exhibited that “qualitative research is of specific relevance to the study of social relations, owning to the fact of the pluralisation of life worlds”. This methodology is designed to supply the researcher with the viewpoint of target population via concentration in a society or situation and direct interaction with the people under research. The research procedure has been explained as “based on methods of analysis, explanation and argument building which involve understandings of complexity, detail and context” (Mason, 2002, p16).

The research strategy focuses on the inductive approach, which is normally applied in qualitative research. Comparing with the deductive approach to evaluate the hypotheses, through the inductive method, the researcher could gather a systematic
understanding of the research participants’ social backgrounds, experiences and processes in some subjects (Blackstone et al, 2008, p3). Neuman (2000) has expressed that when doing the inductive approach, the researcher should begin with comprehensive observation of the related subject and move toward more conceptual generalizations and ideas.

Based on the inductive approach, questions are designed about the phenomenon. Gorman and Clayton (1997, p 52) have suggested that “by asking “how” and “why” questions the research is able to collect explanatory data that contribute to understanding the meaning of phenomena from those involved directly in events and processes.” Therefore, the research questions are designed as open questions with what, how and why that will provide interviewees the research scope to answer the question with elaboration. For example, regarding the outsourcing relationship building, the questions are on what the vendor selection criteria are and how to establish and maintain the outsourcing relationship. Concerning the change requirements management, the questions are about how to validate and trace the changes. Then, the research data will be collected from the interviews with the case company staff. After the overview and evaluation of the data analysis, the research findings will be formulated systematically.

4.2 Case Study Approach

In the virtual practice of qualitative research, case study is a critical and conventional category. Punch (1998, p.150) has specified the case study approach as:

“The basic idea is that one case (or perhaps a small number of cases) will be studied
in detail, using whatever methods seem appropriate. While there may be a variety of specific purposes and research questions, the general objective is to develop as full an understanding of that case as possible.”

The reasons for the methodology is that the dissertation will do an empirical investigation for studying phenomenon in real life and the research will be carried on by in-depth interviews to analyze the addressed objectives. The scope of case study with data collection and data analysis strategies is defined as follows:

The case study inquiry

- investigates a contemporary phenomenon within its real-life context, especially when
  - the boundaries between phenomenon and context are not clearly evident (Yin, 2003, p 13).

Based on the research formed by inductive method, case studies could investigate the details of experiences and processes. Tellis (1997) has indicated that “case study can be seen to satisfy the three tenets of the qualitative method: describing, understanding, and explaining.”

In the dissertation, the investigator will utilize case study to explore the research objectives of outsourcing relationship and change requirements management appertained to the project management. Then, based on the data, the research will understand, describe, and explain the situations of these two subjects of the case organization.
4.3 Research Design

Hart (2005, p 313) has defined that “research design is, like other forms of design, the stage where what you have defined is made possible in a detailed specification.” In fact, a specific structure is the outcome of research design, which includes data collection and data analysis as well as integrating the major sections of the dissertation.

4.3.1 Background of the case company


Chinatrust commercial bank was established in 1966, initially widely-known as the China Securities Investment Corporation (CSIC). Nowadays, the enterprise has become a big private bank in Taiwan. The bank supplies a variety of products, such as deposits, loans, foreign exchange, credit cards, bonds, and proprietary dealing in futures, and so on. In order to support these bank services, the enterprise has invested much effort into information systems establishment. Therefore, IT department has played an important role, which has to support the whole bank to provide better and innovative financial products and services.

From 2002 year, with the more banking services, the IT department has started to process IT outsourcing in order to deal with the more IT requirements. At the beginning, the scope of the IT outsourcing was only to support the hardware maintenance and IS operation. Currently, there is 35% software developing effort outsourced to the third party, even there are some IT projects outsourced entirely. Thus, the case company has established some standard working flows, such as the
contract guideline for employees to deal with the outsourcing businesses more efficient.

In fact, the IT department has built various standards in order to strengthen the information management. Not only the outsourcing process guideline, the policy for requirements management has also established recently. Although the change requirements in IT project is inevitable, the conflicts from it between the business units, IT department and vendor firm could be reduced based on these rules. This is because the case company is selected as the case study in the dissertation. According to these interviewees’ expression, the researcher could analyze the outsourcing relationship and change requirements management in the case organization.

4.3.2 Data Collection

In this dissertation, interview is the main sources of data. Actually, the data collection approach could lead researcher to recognize the specific experience from interviewees and narrative the construction of the research. The data collection method of this research is in-depth telephone interview. The potential participants will be the staff members worked in the IT department at the case enterprise. Follow up emails were sent to the interviewees asking for more information or clarifying the points made during the interviews.

In detail, in order to perform the case analysis in qualitative research, the data collection of the research is the problem-centered interview (Witzel, 2000). This kind interview is characterized by three essential criteria:

“Problem centering (i.e., the researcher’s orientation to a relevant social problem);
object orientation (i.e., that methods are developed or modified with respect to an object of research); and finally process orientation in the research process and in the understanding of the object of research” (Flick, 2006, p161).

A qualitative interview should comprise a preceding short questionnaire, the interview guide, the tape cording, and the postscript (an interview protocol) (Witzel, 2000). Although there is no questionnaire and postscript, the research participants will receive the interview guide before the interviews, and the interviews will be recorded by electronic devices. This guide is designed to support the interviewees to understand the interview key points and to emphasize the audio recordings made during this research will be used only for analysis and for illustration in conference presentations.

4.3.3 Sample Composition

The target participants of the interview are the bank staff, who are all professionals in the domain and expected to supply the working experience and practical recommendations. Silverman (1993) has revealed that qualitative interview is often conducted with a small sample. In this dissertation, there are three viewpoints from IT top management, IT project participants, and business employees. As bank staff at different positions may have different perceptions about the same issue. In detail, the interviews with eight participants as IT decision-maker, project managers, outsourcing matter manager, two project leaders, two project member, and business analyst.

Afterwards, the researcher provides the descriptions of the special IT positions. Firstly, The Project Leader is usually the IT senior staff to play the role in order to support the
project manager to deal with the specific system development. If IT projects range over diverse systems there will be several project leaders from different systems involved in the IT project organization. Secondly, Outsourcing Matter Manager takes responsibility for the entire matters of IT programming pool outsourcing, such as contract process, vendor management, and performance measurement and so on. Lastly, the partial work contents of the Business Analyst are to confirm the IT requirements with the end-users and transfer it to IT staff. Actually, the employee is usually involved in information system development, including project requirements discussion and user accepted test.

The interviewees have positioned in outsourcing related works. Some have taken responsibilities for managing outsourcing matters, and some have worked together with the vendor staff. The details of the participants are listed as below.

<table>
<thead>
<tr>
<th>No. of Interviewees</th>
<th>Job Title</th>
<th>Seniority</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Decision-Maker</td>
<td>16 years</td>
<td>Making IT strategies and managing the deploying the IT resources</td>
</tr>
<tr>
<td>2</td>
<td>Project Manager</td>
<td>11 years</td>
<td>Coping with IT projects of Core-banking system</td>
</tr>
<tr>
<td>3</td>
<td>Project Manager</td>
<td>8.5 years</td>
<td>Dealing with IT projects of Open Platform system</td>
</tr>
<tr>
<td>4</td>
<td>Outsourcing Committee Leader</td>
<td>8.5 years</td>
<td>Performing the outsourcing matters, such as contract, payment and status review</td>
</tr>
<tr>
<td>5</td>
<td>Project Leader</td>
<td>7.5 years</td>
<td>Supporting project manager to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>deal with the IT projects of Core-banking system</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>System Analyst</td>
<td>3 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Processing the system analysis of Core-banking system</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>System Analyst</td>
<td>8 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dealing with the system analysis of Open Platform system</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Business Process Owner</td>
<td>15 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Designing the teller transaction flow and supporting IT team to confirm the project requirements</td>
<td></td>
</tr>
</tbody>
</table>

### 4.4 Data Analysis

To analyze qualitative data, the research will begin with the process of organizing, reducing and describing the data, with the purpose of drawing conclusions in interpretations from this. Moreover, the analytic technique of this research will be explanation building. Yin (2003, p120) has indicated that “the goal is to analyze the case study data by building an explanation about the case.” The analysis frameworks will depend on the literature study. After data coding, the research data from the interviews will be organized and placed into the categories of the frameworks.

According to the interview results, the researcher will investigate the position of case company in outsourcing developing stage and relationship. Moreover, the investigator will explore the requirement change policies and control procedure in the case organization. Lastly, the change requirements management in outsourcing project will be studied.
5 Case Study

A personal banking IT Department of a large private bank in Taiwan has been employed as a case study in the dissertation. The case company has adopted IT outsourcing for several years. The IT department has followed certain guidelines for performing the IT outsourcing and has set the particular procedure for managing change requirements. This chapter aims to introduce the IT organization structure and roles, the system developing life cycle, and outsourcing situation. The information is gathered in terms of the company website, the research interviews and the document provided by the interviewees.

5.1 IT Department and Project Organization

In the case company, the IT department of personal banking mainly takes responsibilities for developing and maintaining the core-banking system, including saving, loan and channel sub-systems. In addition, there are other outside open systems, like teller and network banking systems.

In order to provide the high-quality service for business units, the IT organization is divided into three teams. Each team is formed by IT engineers of core-banking system and open platform systems as well as supports the specific business units, such as the system development team 1 is responsible for performing IT projects for personal wealth management unit. Under the each team, the employees have positioned as project manager (PM), account officer (AO), project leader (PL), and system analyst (SA). Besides, the data warehousing team and system maintenance team are also
belonged to the IT department.

Based on the IT organization, the employees could accumulate the particular IT know-how and skills rapidly. Although the organization is separated by business types, these IT teams will support each other if the IT resources are insufficient.

The detail framework of IT project organization is displayed as following diagram.

![IT Organization Structure in Personal Banking](image)

**Figure 4. IT Organization Structure in Personal Banking**

In practice, almost all IT projects are initiated by the business unit. A typical IT project consists of business and IT frameworks. The main obligations of the business line include generating the project initial requirements and processing the user accepted test (UAT), and transferring the project related messages to all branches. In fact, some of the roles are involved in IT project in order to ensure the IS developed by users’ expectations. And, the IT line is responsible for performing the technical details of the project, including functional design, system analysis, system integrated test (SIT), user accepted test (UAT) support, and implementation. Nowadays, the coding and unit test (UT) is almost outsourced to the third party; therefore, a project
organization also includes the team from the vendor. The structure of a project
organization is displayed as the following diagram.

![IT Project Organization Structure in Personal Banking](image)

**Figure 5. IT Project Organization Structure in Personal Banking**

### 5.2 The Introduction of the Role in IT Project

Based on the above figure, the specific roles and related responsibilities of IT project
are explained as:

**Project Director (PD):**

Project Director is the top management whose primary responsibilities are reviewing
the project progress and making strategies. An IT Project Director should also deploy
the IT resources to ensure the IT project success.

Project Manager (PM):
Project Manager’s major role is to perform all details in IT project, such as budget estimation, project scope and schedule confirmation, and project member arrangement, and so on. During the project developing period, project Manager should administrate project progress and resolve conflicts with the business department and the outsourcing vendor company.

Account Officer (AO):
AO’s responsibilities are to processes the requirement verification and validation matters. After the project scope confirmed, AO has to transfer final requirements into functional specifications. Then, the project leader and system analyst will depend upon the document to process system analysis.

Project Leader (PL):
In general, one IT project normally involves several systems development, such as the core-banking system, teller system, and ATM system. In order to control each part developing progress and negotiate the matters of cross systems, there are several project leaders of different systems assigned to support the project manager to manage their own system development. Project leaders are usually senior technical engineering who are familiar with the IT and relevant know-how and skills. They could assist in confirming technical specification as well as support the system analysts and programmers to resolve the IS developing problems.
System Analyst (SA):

Based on the functional specification, a system analyst has to process the system analysis and write down the result as the technical specification, which includes the program interpretation, database description and other developing information. Then, the technical specifications will be delivered to the programmer. During the programs developed period, system analysts should support the programmers to resolve the coding and testing problems. After the programs returned, system analyst has to design the test case of system integrated test (SIT) and process it.

Programmer (PG):

Programmers are responsible for coding and unit test (UT) the computer programmers. They should design and perform the test cases. Then, the programs with the test reports should be returned to system analyst.

Business Process Owner (BPO):

Based on the users’ requirements and business acknowledge, the business process owner is responsible for designing the transaction flow and producing the initial project requirements. At the beginning of a project, BPO should assist in confirming the final requirements with account officer, and after the completing system integrated test (SIT), BPO should process user accepted test (UAT) in order to ensure that the products have met the users’ requirements.

Project Officer (PO):

This is a team to support business process owner for transferring project information to branches. The information is usually about the transaction added, updated, and
5.3 Software Development Life Cycle

The case company has established the annual system developing milestone and project implementations release cut, which is processed every six weeks. The system milestone sets the time points of software developing activities, such as requirement confirmation, system analysis, and system integrated test (SIT). In the end of each timeframe, the developers should submit the related documents, such as functional specification (FS), technical specification (TS), and test reports. The software developing life cycle with the roles of the case company is described as the blow diagram.
Figure 6. Software Development Life Cycle in case company

5.4 Outsourcing situation

The outsourcing situations in the case company are described below. In the organization, the types of outsourcing are separated as programming and project outsourcing.
5.4.1 Programming outsourcing

The programming outsourcing is managed by outsourcing committee group. The organization of the group is displayed as follows.

![Outsourcing Committee Group Organization](image)

The committee leader has takes responsibilities for outsourcing contract and the developing progress control. The three leaders of saving, loan and channel systems have to confirm how many requirements could be outsourced of each release cut and then allocate the vendor programmers to process system development. Generally, they also have to control the developing progress with vendor leader. The financial personnel should check the vendor working man/days and cope with the outsourcing payment frequently. The vendor account manager deals with the case company...
outsourcing matters, including contract and financial issues.

5.4.2 Project Outsourcing

The project outsourcing is entirely managed by IT project manager. From the vendor selection to system implementation, project manager should handle everything and report to the top management. In this outsourcing type, it is possible that the whole IT project outsourced to the third party. This situation is normally adopted by the open platform system development. However, the partial project outsourcing is more employed by the core-banking system development because the system structure is more complicated. In fact, vendor has played an important role in both of the two types. Therefore, having the same expectations of the project outcomes is very important and communication is a main way to achieve the target.
6. Results Analysis

Through the interviews, the outsourcing relationship building and maintenance and the change requirements management in case company is explained entirely. According to the framework of the literature studies, the key concepts of the case study are presented as:

1. IT outsourcing strategy
2. Vendor issues
3. IT outsourcing relationship building and structuring
4. Outsourcing relationship management process
5. Vendor’s performance measurement
6. Change requirements management – company level
7. Change requirements management – project level
8. Change requirements causes and impacts
9. Change requirements management in outsourcing project

Based on the structure, the interview transcript will be cited to display the real situation of outsourcing relationship and change requirements management in case company.

6.1. IT Outsourcing Strategy

An outsourcing strategy is an association with business strategy and IT services. This means that strengthening the IT products and services aims to achieve the business
targets, such as an increase in the customer number and cost reduction. Thus, the strategy could be made by top management in business unit and IT department. According to the interviews, the key reasons for IT outsourcing in the bank is the resource and cost factor. The explanations from IT employees are described as follows.

1. In order to support the business unit for adapting the market environment and non-fixed quantity of IT requirements, the IT outsourcing is necessary to support the information systems development in work high peaks.
2. The shortage of the specific IT skills, knowledge, and specialists, which are usually in the new, or non-popular but practical IT capabilities (IT Decision-Maker).

Moreover, from project management’s perspective, the motive is explained as cost reduction and resources insufficient.

1. For long-term IT development, the cost of IT outsourcing is lower than internal employees.
2. After IT outsourced, internal staff could concentrate on the core business and raise the competitive advantages. In fact, there were some IT projects outsourced due to the resources limitation, especially in system package outsourcing projects. This was because the internal employees have no the know-how about the base products of the packages (Project Manager in core-banking system).

Based on the theory of outsourcing relationship phases (Gottschalk and Solli-Sather, 2006), the case bank has positioned at the resource stage. Although the cost reduction
is also considered as a factor, the resource demand is expressed as the key factor by IT Decision-Maker that the enterprise would like to access the external resources of IT specialists to enhance the IT services.

The major objectives of IT outsourcing are software developing and partial PC repairs. The maintenance of online applications and hardware, mainframe and open system servers, are processed in-house in order to protect the sensitive customer information. The types of IT outsourcing in the case company are selective and project outsourcing. Based on the system properties, the kinds in the core-banking system are selective and project outsourcing. The selective outsourcing means the partial system analysing and programming outsourcing due to the shortage of the COBOL language specialists. And, The project outsourcing is used in application package project.

The developments in open platform system usually subcontract the whole IT project to the third party, and the case company is just responsible for managing the project, including cost and progress control and assist in resolving some developing problems. This is mainly resulted from the lack of know-how about new technology.

### 6.2 Vendor Issues

Regarding the vendor selection, the bank selects vendor on the basis of the motivation for outsourcing and objectives of outsourcing. Then, the certain vendor selection criteria are used in the selection process. Overall, the IT capacity of vendor is the primary criterion. Moreover, company size and its financial situation should also be considered. In the case company, the vendor types are systems houses and hardware providers (Michell and Fitzgerald, 1997). This means that systems house, like EDS or
TATA, supplies the IT specialists to make up the manpower gap, and then, the hardware providers offer the PC maintenance.

Additionally, from the geographic viewpoint, in order to target at cost down, the outsourcing type in this bank is onsite/offshore mode. The means that system analysts from the vendor company work in the client site and the programmers are all in the offshore local. Besides system analysis, these system analysts are also the account personnel to contact the offshore programmers.

Regarding the vendor selection criteria, the IT top management responded to estimate the vendor’s resources, IT abilities and product feasibilities.

We selected the outsourcing vendor based on 1) IT specialists resources and the qualify IT abilities; 2) the vendor’s background and size, which means the corporation should be developed continually; 3) the long-term price and discount. In addition, we surveyed the vendor’s service by product and solution which could support the business operations. Then, the trend of the production and technology could be well in the future (IT Decision-Maker).

The two key criteria are similar to the suggestion from McFarlan and Nolan (1995). Although the price is also considered as a criterion, the IT Decision-Maker has emphasized that price factor is less important than other two criteria. This result is in agreement with the argument from Zhu et al. (2001) that expressed “the choice of outsourcing candidates is no longer made on a cost-cutting basis.”
Moreover, the executives choose the vendors depending on each project’s property. For example, if a project aims to establish the information systems used for overseas branches, the international vendor will be chose. On the contrary, they prefer the local vendor if an information system built for domestic users.

In detail, the vendor selection procedure in the case company is listed as follows.

1. Project requirements are generated by business process owner (BPO).
2. Evaluating project return on investment (ROI) by the top management in business unit.
3. This project is initialed and informed IT department.
4. The IT project team is organized.
5. IT project manager confirms the functional requirements with the business process owner (BPO).
6. IT project manager fills out the “Feasibility Estimation Form”, which includes IT outsourcing or in-house development evaluation.
7. Based on the project requirements, the vendor selection criteria are defined by the IT department.
8. After project budget confirmed, vendor is selected by the IT department and business unit.
9. Outsourcing price is negotiated by financial staff.
10. Outsourcing contract is formulated with rights, obligations, SLAs, and maintenance conditions, and so on.
11. Outsourcing contract is processed by both parties.
12. The project is arranged into the “IT project developing schedule”.
In fact, the vendor selection procedure is similar with the recommendation from Melymuka (2002). The major tasks are requirements confirm, project team organized, requirements feasibility estimation, vendor selection, and contract process.

Regarding the vendor selection criteria, project manager depended on the functional and non-functional requirements to formulate the business and IT capabilities verified standards. Overall, the business part is created based on the user’s requirements. While, the IT capacity part typically includes program developing, database management, system administration, security control, network infrastructure, and guarantee and maintenance. These standards are formulated by project manager and other system engineers. For example, the conditions of database management are generated by project manager and database administrator (DBA).

6.3 IT Outsourcing Relationship Building and Structuring

The contract expresses the outsourcing relationship, which defines the output products and services, financial conditions, staff transfer and project milestone. If this is a system customization project, there is a term to emphasize that the intellectual property right of the products will belong to the bank. Basically, the warranty of applications is arranged by vendor’s strategy, which is normally from three months to one year.

Furthermore, in order to have the same expectations of project quality and efficiency, the performance measurements are stipulated in terms of the service level agreements (SLAs) and performance indicators (KPIs). In the case company, the SLAs specified with the vendor firm are the same as the internal one, which is arranged between the
business unit and IT department. The main objectives of the SLAs concentrate on system stability and information accuracy. While, the performance indicators (KPIs) are organized by each project that key points are on budget, on schedule, and on quality. Under the three key points, there are several explicit measurable items identified, such as the incident reports (IRs) solution rate in UAT should be larger than 98%.

In fact, the key elements of outsourcing contract is as same as the theory of Platz and Temponi (2007), which includes the performance elements, financial elements, human resource elements, and legal elements.

### 6.3.1 Knowledge sharing

Besides formal contract, knowledge haring is an intangible way to build the outsourcing relationship in post-contract period. Because the information systems of each company is unique, knowledge transferring is necessary. In addition, to be a more competent partner, the outsourcer has to understand lots of knowledge about the client (Johansson, 2003).

In fact, knowledge sharing and working together were also the ways to construct the outsourcing relationship (Project Leader in Core-banking system).

Moreover, the project manager of core-banking system revealed that in some offshore outsourcing project, several employees were assigned to work in the vendor offshore location in order to transfer core-banking and business knowledge.
6.4 Outsourcing Relationship Management Process

In the organization, the main way to manage outsourcing relationship is communication, including internal and external communication. The internal communication is for IT employees to follow the IT outsourcing strategy and adapt the situation. However, the external communication is to support the vendor to perform the outsourcing project better.

6.4.1 Internal communication

Some employees may concern whether they can keep their jobs after IT outsourcing. They may also worry about whether they will be transferred to other teams. Facing with this situation, internal communication and training become very important.

We tried to express that outsourcing vendor aimed to aid the low-end tasks. The IT employees had to learn to cope with the more high-level works, and then, they could contribute more benefits towards our company (IT Decision-Maker).

Therefore, the employees participate in the internal training and learn necessary IT knowledge and skills with the aim of performing the more critical developing tasks.

After IT outsourcing, we learned other IT knowledge and skills, such as new skills about new platform, developing system, and computer languages in order to process new works (System Analyst in Open platform system).

With the learning constantly and a high level of understanding of bank business, the
employees in the bank do not think that they are threatened by the IT outsourcing.

We must understand banking business and IT workflow in a short period. In general, the new employees have to transfer the working contents from programmer to system analyst after one year. However, I do not worry about that the vendor will replace them. Because of the personnel change frequently, it is difficult for vendor staff to accumulate the system developing experiences (System Analyst in Core-banking system).

### 6.4.2 External communication

Regarding the outsourcing relationship management, communication is the major approach for IT staff to managing and maintaining the outsourcing relationship. With proper communication, project manager can control the project schedule and pass the conflict resolutions.

- **Communication in project outsourcing**

  In the case company, communication management is normally stipulated in an outsourcing contract, including conference plan and information intercommunication. The conference plan expresses the communication structure, containing regular meeting and other specific conference, such as information security discussion.

  During the project processing period, there was daily meeting with project members to review status, and the agenda was tracked as well. The meeting reports was sent to the executives of the business unit and IT department through electronic malls. Besides, the project manager weekly meeting was called to review the project schedule and resolve the relevant problems. Moreover, the
project director monthly meeting was processed by conference all. The meeting was mainly used to have the same expectations of the project results by IT department and vendor firm (Project Manager in Core-banking system).

In addition, the communication for system developing includes meeting and document sharing. The regular meeting with vendor engineers is to check the project schedule and review the system design and test situations.

There were system construction review meetings, which were called in the end of each developing stage, such as system analysis review and code review. In the test stage, the daily meeting was called to review the test incident reports (IRs) (Project Manager in Open Platform).

Regarding the document sharing, project members could save the project and system documents in a particular server during the system developing period. This channel was shared with users and maintenance team. In fact, data management was different in every project, and therefore, the project manager had to make an arrangement with users at the initial stage of the project (Project Manager in Open Platform).

- Communication in programming outsourcing

In this type of outsourcing, regular meeting and working report are the main ways to manage the programming progress.

In practice, the vendor programmers submitted the working report per week, and the “developing progress report” was generated by the outsourcing committee.
members in order to report the developing situation to account officers (AOs) and system analysts (SAs). In addition, the weekly meeting was called by the committee members with the vendor onsite leader to discuss the whole developing progress. Additionally, the vendor account manager reported the collaborative situation to the case company every six months. According to the meeting, the case company and vendor firm discussed the cooperative problems and solutions, such as the quality issue (Outsourcing Committee Leader).

In sum, the approaches of outsourcing relationship management are close to the demonstration of Goles and Chin (2005), which contains communication, conflict resolution, coordination, cooperation, and integration. Although the main approach is communication, it supports to perform conflict resolution and coordination. In the case company, the cooperation focuses on the system development, as well as the company's structure, policies and procedures are integrated to establish and maintain the IT outsourcing relationship.

6.5 Vendor’s Performance Measurement

Vendor’s performance survey is a critical issue in outsourcing relationship management. The measures of IT objectives are determined by the service level agreements (SLAs) and performance indicators (KPIs). Moreover, it is also estimated by IT employees’ satisfaction. From the business unit’s perspective, the whole outsourcing performance is surveyed by customer’s satisfaction. In practice, a combination of these ways is normally used to survey the vendor’s performance in the case company.
6.5.1 Vendor’s performance measure approach

From the IT top management’s perspective, the vendor’s performance is mainly measured by the service level agreements (SLAs) and performance indicators (KPIs).

At the project outsourcing level, after the applications were on production, IT department traced the system performance six months to one year. If there was no any system failure repaid for IT department and met the SLAs and KPIs, the project was measured well. At the programming level, the outsourcing committee estimated the vendor’s performance through man/day and the number of incident reports (IRs) after each release cut completed (IT Decision-Maker).

In practice, from the project management’s viewpoint, the vendor’s performance should be checked intensively, especially in the cross system projects.

Because there were several departments involved in the project, every developing stage could be checked carefully in order to ensure the project schedule and quality. Besides, the project manager requested the vendor to provide the sign-off documents for each developing stage, such as parameter and database setting description, system gap and limitation analysing report, and project human resource report (Project Manager in Core-banking system).

Moreover, if the cooperative mode is programming outsourcing, the vendor’s performance is checked by the system tests.
After the programs and the unit test (UT) reports returned to the case company, system analyst (SA) checked the program quality by the number of incident reports (IRs) of system integrated test (SIT) and user accepted test (UAT) (Project Leader in Core-banking system).

For the open platform system development, the vendor’s performance was checked via milestone by weekly meeting. After the project on production, the system problems were checked and traced by daily meeting. The vendor’s performance was measured by the speed and accuracy of the problems resolved (Project Manager in Open platform system).

Regarding the programming outsourcing, the outsourcing committee group checks the vendor’s performance by “Client Satisfaction Questionnaire” regularly. Based on the result, the vendor is requested to overcome the drawbacks and improve the developing quality.

6.5.2 User’s satisfaction for IT outsourcing

The user’s satisfaction has divided into two types as project satisfaction and customer satisfaction. The project level is measured by each project, and the customer satisfaction, which concentrates on the whole IT services, is investigated by all users in the case company every year. In fact, both of these two satisfactions have disclosed that the quality of the IT services should be improved.

After long-term observation, we found that the vendor’s performance was worse than the internal employees’ one. Actually, IT outsourcing could not assist in
enhancing the user’s satisfaction (IT Decision-Maker).

The quality of the IT services produced from outsourcing project should be improved. The IT employees should consider the better approach to handle the quality issue (Business process owner in business unit).

6.5.3 IT staff’s satisfaction for vendor performance

That vendor’s performance is not satisfied by IT employees because of the quality and efficiency issues. In addition, the vendor cannot meet the requirement of human resource is another problem noted by IT Decision-Maker. Moreover, the project manager in core-banking system said:

The entire IT outsourcing performance was not so good. In detail, the onsite outsourcing was better than offshore outsourcing. The main causes were cultural differences and insufficient business know-how of the case company (Project Manager in Core-banking system).

In core-banking system, a major reason for the poor quality of IT outsourcing was that the IT project schedule was always restricted. Unless the vendor developers were senior and familiar with the core-banking system, the project was not processed well. Moreover, the frequent personnel change of vendor engineers was another reason. This leaded the vendor to be unable to accumulate the system developing experiences of the case company (Project Leader in Core-banking system).
The IT employees’ satisfaction was not good, due to the communication and vendor’s attitude issues (System Analyst in Core-banking system).

While, the IT staff that are responsible for developing open platform system provided some opinions blow.

Generally speaking, the vendor’s performance in open system was mediocre. Because of the system properties, there were a variety of vendors in the market and the competition was intense. In other words, the case company could select a qualify vendor easier. However, if it was the first time to collaborate with a new vendor, project manager had to spend a lot of time to communicate the workflow and system construction. Furthermore, the satisfaction of the offshore vendor was normally worse than the onsite supplier due to the cultural differences and outsourcing policies dissimilarity (Project Manager in Open Platform).

Account officers (AOS) and system analysts (SAs) had to repeat the vendor training because the vendor engineers were often different. Additionally, the vendor developers did not test the programs entirely because they did not understand the business know-how and system structure extremely (System Analyst in Open Platform).

From the outsourcing committee leader’s viewpoint, the satisfaction of contract process and payment are not good. In practice, the contract process in vendor’s firm is too long, and sometimes, there are some arguments on outsourcing man/days calculation and payment between two parties. The leader also thinks the vendor should improve the system developing quality.
6.6 Change Requirements Management – Company Level

Change requirements management is an important topic in project management, especially in outsourcing project. Although the unpredicted change requirements are inevitable, the organization should handle it better based on proper policy, tool, and management process.

In the case company, the IT department and business unit have established a workflow for change requirements application, which includes the steps as:

1. Business process owner (BPO) triggers the change requirements and fills out the “Change Requirements Application”.
2. Business unit supervisor approves the “Change Requirements Application”.
3. The “Change Requirements Application” is sent to the account person, who takes responsibility for arranging the requirements for release cut. Furthermore, the change requirements should be noticed to IT Account Officer or Project Manager.
4. IT Account Officer or Project Manager has to estimate the change requirements feasibility, including the system analysis and risk class.
5. IT supervisor approves the “Change Requirements Application” based on the change feasibility evaluation from Account Officer or Project Manager.
6. If the risk class is high, the “Change Requirements Application” should be approved by IT Decision-Makers.
7. The business unit supervisor has to approve the “Change Requirements Application” again based on the IT estimation.
8. After the change requirements arranged into release cut, the IT employees start to process the system developing.
9. The “Change Requirements Application” is filed by the IT officer. All the communication is processed by electronic mail in order to reduce the time of the workflow. Additionally, the statistical report of change requirements is generated regularly and sent to business and IT units Decision-Makers.

In fact, the main aspects of the working procedure are similar to the three principal phases expressed by Sommerville (2007) as change design, change analysis, and change requirements implementation.

Besides, the top IT management requests project managers to establish a “requirements change committee” for each project. This team is composed by senior employees who may not be the project members. Based on the rich experiences, their suggestions can help project manager to handle the change requirements well.

If the change requirements impacted the project cost, schedule, and quality, the committee members had to decide to approve or reject it. Once the change requirements approved, the members had to discuss the more investment and project schedule adjustment (IT Decision-Maker).

6.7 Change Requirements Management – Project Level

At project management level, it is critical to confirm the change scope. Setting baseline requirements at the project initial stage is a good way for project manager to judge change requirements. Then, further effort estimation and extra resources negotiation with the user and vendor are other challenges. If the project resources are limited, the main solution is to make the project online by different phases.
I handled change requirements through frozen time point and baseline requirements. I confirmed the first version of user requirements and documented it as the functional specifications (FS). Afterwards, the change requirements could be identified by the paper. Then, I had to negotiate the extra resources with vendor. If there was no resource to support the change requirements development, I had to adjust the all requirements’ priorities with users’ agreement. This means that the main functions of the project were on production at the first stage. Afterwards, other requirements were postponed developing. Additionally, if there was more budget produced, the extra expenses were reported to the top IT management (Project Manager in core-Banking system).

6.7.1 Change requirements Evaluation

Unless the whole project outsourced, the change requirements evaluation is normally processed by the internal employees depending upon their comprehensive understanding of the system. Besides the change requirements feasibility estimation, it is necessary to ensure the existing system not affected. In general, the steps of requirements evaluation in the case bank are detailed below.

1. Based on the teller transaction flow, the end-to-end system analysis is processed, including the existing programs evaluation and the new programs design.

2. The change requirements feasibility is estimated based on the system structure. When the result expressed the system construction may be impacted, the change requirements are rejected.
3. The developing effort is evaluated by man/days depending upon the number of programs, difficulty degree, and developing personnel quality.

4. The technical specification (TS) is updated and delivered to programmers for coding and test. However, if the project schedule is limited, the system analyst will develop it voluntarily (Project Leader in Core-banking system).

In fact, the procedure is close to the steps of requirements change impact evaluation exhibited by Strems and Sugden (1996).

6.7.2 Change requirements Traceability

In the case bank, the change requirements traceability is controlled by people, not tool. Based on different project manager, there are diverse tracing methods. In general, the change requirements are recorded by electronic file and controlled by the project manager and the account officer.

The account officers were asked to review the functional requirements. They listed the change requirements by Microsoft Excel and reported it to project manager regularly (Project Manager in Core-banking system).

I designed a specific number by date, change type, and a serial number for each change requirement. Thus, the change requirements were traced by the particular number (Project Manager in Open Platform).

6.7.3 System Document Version Control

In the case company, the version of system documents is controlled by the IT
employees. Although there is the PVCS tool, it is used to store the project and system documents. For example, the version of technical specifications (TS) is managed by the account officer (AO) and system analyst (SA). When the documents updated, the account officer (AO) will send it to the vendor programmers by electronic mail, and the system analyst will explain it via the “Delivery Explanation Meeting” again. If the vendor programmers are all in the offshore location, the meeting is called by conference call (Outsourcing Committee Leader, and System Analyst in Core-banking system).

In fact, the version of system document is not controlled very well. Due to the succinct project timetable, some system documents stored in PVCS do not match with the programs (Project Leader in Core-banking system).

6.8  Change Requirements Causes and Impacts

Understanding change requirements causes could let project manager to rearrange the requirements’ priorities. For example, if a change requirement is prompted by law issue, it must be developed as soon as possible. Evaluating change requirements impacts is also necessary. Based on the result of the analysis, project manager could estimate and avoid the potential risks as well as the project member could recognize the affected programs and enhance the test.

6.8.1 Causes

The causes for change requirements are various, such as 1) enterprise strategies changed; 2) government laws and decrees changed; 3) users’ experiences insufficient;
4) business unit supervisor or end-user involved changing requirements (Project Manager in Open Platform).

In the offshore outsourcing project, the reasons are detailed as:

1. Language leads to the cognitive gap.
2. After system analyzed, the misunderstandings of project requirements have been found.
3. Personnel change leads the change requirements to be produced (Project Manager in Core-banking system).
4. A change of mind by the process owner (PO) what they really want.

Moreover, from the business’s viewpoint, the reasons for change requirements are mainly law and customer service issues. In fact, designing the IT services easy operated and ensuring the customer information conferential should be converted into the transaction design (Business process owner in business unit).

Most these change requirements reasons are like the expression by Candle and Yeates (2001), such as new stakeholders involved, the results of system analysis, new legislation, and a straightforward change by the users. While, one finding of the result analysis is that change requirements may be produced by language difference in offshore outsourcing project.

**6.8.2 Impacts**

In principle, the project manager evaluates the change requirements depending on the
project timeframe. If the changes happen before the user accepted test (UAT), most project managers will accept it. In the user accepted test (UAT) stage, unless the user has found that the existing transaction flow will be impacted without the change requirements, the changes are approved. Otherwise, the change requirements will be developed in the next stage.

The key impacts of change requirements are cost, schedule, and quality of the project. The extra cost is mainly due to the developing human resources added. Moreover, the whole project schedule is extended because the number of implementations is increased. Furthermore, quality of the applications is impacted because the test scope for the change requirements is not designed completely or there is no enough time to test. In general, the project manager controls the quality seriously, because the quality factor is usually not satisfied by users.

In order to control the project quality, I reviewed the project status, especially in the test situation, and then, I could avoid the potential risks (Project Manager in Core-banking system).

In addition, the system developing rework is also an impact for IT engineers. Based on the change requirements happened time point, the system developers have to repeat the relevant developing tasks. The account officer (AO) has to re-verify and re-validate the project requirements and confirm the system impact scope. For the system analyst (SA), the major task is to process the system analysis again, including the technical specifications (TS) update. For vendor programmers, they have to re-coding and test the programs depending on the new technical specifications (TS).
6.9 Change Requirements Management in Outsourcing

Project

In outsourcing project, the better change requirements is managed, the better outsourcing relationship is maintained (Project Managers in Core-banking and Open Platform systems, Project Leader in Core-banking system and System Analysts in Core-banking and Open Platform systems). In order to achieve the target, the change requirements management policy of client organization is necessary for vendor and internal staff to handle the unpredicted changes through the same standards. However, the change requirements are managed depending on different projects and project managers in the case bank.

Some vendors argued that their performance was affected by the change requirements. If the client company established the explicit rules for change requirements management, the IT staff and vendor firm could process it more effect and efficient (Project manager in Core-banking system).

With a standard for change requirements management, the outsourcing vendor could administrate the project scope better and improve the quality of system development (System Analyst in Open Platform).

Besides, enhancing communication for change requirement management in outsourcing project is necessary. With the effective communication, the client and
vendor can overcome the cultural differences and have the same way to process the change requirements development. In fact, the main objective for the communication is to negotiate the project resources and the relevant solutions. The communication approaches include fact-to-face meeting, electronic mail, and conference calls. In order to avoid the understanding gap, the major communication approach is face-to-face meeting, which is used to discuss the detail change requirements scope, impacts, and developing method (Project Managers in Core-banking and Open Platform systems).

After the change requirements confirmed, I reviewed the each requirement and discussed the way of developing with the vendor representative by the non-scheduled face-to-face meeting. Because the unplanned change requirements were urgent, this way could avoid potential communication gap and accelerate the changes developed (Project Manager in Core-banking system).

In addition, collaboration by client and vendor engineers is necessary to ensure the quality of the change requirements development.

In practice, I described the change requirements reasons and explained the results of system analysis. It was important to work together to develop the change requirements (Project Leader in Core-banking system).

Wadia and Sauter (2003) have suggested enhancing requirements management in IT outsourcing relationship through training, work standardization, frequent meeting, and effective communication tools. In the case company, the project managers focus on
meeting and communication to manage change requirements. However, this advises the case bank to strengthen training and work standardization as well.
7. Discussion

This chapter discusses the comparative findings and results from both the literature study and case study in relation to the critical factors in outsourcing relationship and change requirements management. It aims to validate the findings and to supply the convincing results.

7.1 Communication is outsourcing relationship and requirements change management

From the interviews, it is found that communication has played an important role in both of the outsourcing relationship administration and requirements change management. In fact, communications that apply in the post-contract period is essential in outsourcing relationship management (Project Managers in Core-banking and Open Platform systems). Using formal and informal communications, both of the parties could exchange information and resolve conflicts. This finding supports the demonstration by Goles and Chin (2005) that communication is an approach to process the outsourcing relationship management.

In addition, it is found that effective communication is also essential in requirements change management from the interviews with Project Manager in Core-banking system. In fact, Nuseibeh and Easterbrook (2000) have emphasized that change requirements management is also a communication process to gather requirements. However, besides requirements confirmed, this kind communication has also focused
on status review in the case company.

Moreover, it is also found that high-quality communication is related to the individual’s behavioral characteristics. A competent project manager should possess active attitude and excellent negotiation ability. This supports the research discussion by Kern and Willcocks (2000, pp. 342 – 343) who indicates “these managers that ‘span the organizational boundary’ need to be good communicators at both the interpersonal, technical and business level.” Based on the individual’s relationship, the whole outsourcing relationship could work and make the project success.

7.2 Trust in outsourcing relationship

In the literatures, trust has played an important role in outsourcing relationship. As the Lee and Kim (1999) highlight that trust could evolve the satisfying interactions in outsourcing relationship. However, there was no interviewee to express that trust is the factor to establish the outsourcing relationship. This is because the shortage of quality and cultural understanding factors to maintain the outsourcing relationship (Outsourcing Committee Leader and System Analyst in Core-banking system). Their perspectives made good supplements to the theory of Nguyen et al. (2006) that quality of delivered product and cultural understand are the two key factors to maintain the trust relationship.

Although Frost and Sullivan (2005) indicate quality of service is one of the key factors for an IT outsourcing, it is found that quality issue is an obstacle to outsourcing relationship from the case study. This situation is mainly resulted from the insufficient client’s business knowledge and system skills (Project Leader and
System Analyst in core-banking system). In order to overcome this problem, besides knowledge sharing, there are some solutions expressed by vendor as:

The vendor firm strengthened the internal training and established a knowledge database to support engineers to resolve developing problems (Project Manager in Core-bank system).

In fact, this vendor’s solution is in agreement with the argument by Nguyen et al. (2006) as a vendor’s commitment to process improvement is a factor to overcome the quality issue and evolve the trust relationship. In addition, based on the recommendations by Wadia and Sauter (2003), training can improve soft skills as trust and cultural compatible.

In sum, the research finding enhances that the trust relationship is based on quality and cultural understanding and these two aspects could be achieved by knowledge sharing, training and tool support.

### 7.3 Policy and Tool in Change Requirements Management

Based on the literatures, proper policies could improve the change requirement management (Wiegers, 2003). Although there is a workflow process established for change requirements application, this is just looked as one part of policies. It suggests the case bank to employ a coordination procedure, to implement a mechanism, and to build a flexible control policy (Lee and Pena-Mora, 2005).
Besides, an appropriate tool can assist the project manager in estimating the impacts of change requirement and processing the requirement traceability. In fact, a typical requirements management tool is based on database to store the project requirements and provide various functions to access the information about the requirements (Kotonya and Sommerville, 1998). In practice, a proper tool can also supply the change management, quality assurance and issue tracking (Lormans et al., 2004). Although the PVCS offers the function for IT employees to store the system documents, it does not provide other functions to support the impact estimation and requirement traceability. Hence, this suggests the case company to install a stronger tool.
8 Conclusions, Constraints, and Recommendations

This chapter purposes to express the formal conclusion to this dissertation. The framework of the conclusion is to follow the research aims and objectives. Moreover, the conclusion could be also concerned as the future suggestions for the outsourcing relationship administration and change requirements management. Afterwards, the researcher will outline the research constraints. Based on the limitations, there are several recommendations for the further study will be provided.

8.1 Research Conclusions

Due to the information security issue, the type of outsourcing in Taiwan’s banking industry is generally the selective and project outsourcing. Before the IT outsourcing performed, the top managements in IT and business units should make the strategies about the outsourcing budget, and objectives. Based on the outsourcing objectives, the client company could ensure the perfect vendor type. Following this, the outsourcing administrators could design the vendor selection criteria and select a proper vendor.

The outsourcing relationship established between client and vendor firm has depended upon the outsourcing contract. In the document, the terms of rights, obligations, outcome products and services, and the service level agreements (SLAs) should be stipulated clearly. Then, both of two parties could have the same expectations of the project outcome. At the post-contract period, the chief approach to maintain the relationship is communication and knowledge sharing. According to the face-to-face meeting, the project manager of the client company could control the quality and
schedule aspects of the project, as well as to deal with some sudden situations. Additionally, knowledge transferring is another method to strengthen the relationship. When vendor has sufficient knowledge to develop applications, the system quality will be better.

With the purpose of deal with the change requirements, the formal policies and procedure is necessary. In fact, the change requirements are generally initialed by the business unit. After approved by the top management of the IT and business units, the IT project manager has to evaluate the impact scope, including the cost, schedule, and quality factors. Facing with the project resources limited, the project functions online by different phases is a good method. In an outsourcing project, it is essential to communicate with vendor represent about the change requirements via face-to-face meeting with the aim of avoiding misunderstanding of the requirements. Cooperation is also important to speed up the changes developing.

For the case company, in order to enhance the outsourcing relationship management, it is better to build a long-term relationship between client and vendor. This can assist the vendor in accumulating the system developing experiences of the client company. Besides, knowledge sharing, training, and a proper tool support are also good methods. For better change requirements management, a proper policy in client organization could assist vendor in dealing with changes effectively. Additionally, a particular tool can support the requirements traceability, change management, and impacts estimation.
8.2 Research Constraints

As this research was conducted in a small range, some constraints are unavoidable, which are presented as follows.

Firstly, although the research aims to investigate the outsourcing relationship, the concentration of this dissertation is to research the situations of the client organization. It should cover the vendor’s viewpoints to provide the more optimistic results, especially about the project quality issue. The reason is that it cannot include the completeness research and further analysis for such the small-size investigation. Besides, it is difficult to find proper vendors and gather its agreement under the situation of time limited. Thus, there is only single perspective of outsourcing relationship has been researched in the dissertation.

Secondly, regarding the research of change requirements management, end-user of the personal banking should be involved into the research as well. Although the business process owner is the person who takes responsibilities for confirming the IT requirements, the end-user may be requested to supply opinions about the specific operations. It is possible the change requirements generated from the end-user after the project kicked off. Thus, it is better to add the role as a participant, and then the causes and impacts of change requirements will be investigated more exclusively.

Lastly, the sample compositions of the case study should cover the IT department of corporative banking. Although the system developing life cycle is the same in the enterprise, the IT outsourcing administrators, project managers, and outsourcing
vendors are different. If the target population covers this part, there may be some situations, solutions, or suggestions which could be explored and generated by the research. Then, the results of the case study will be more completeness.

8.3 Recommendations for further research

Derived from the research constraints listed above, the recommendations for the further research are expressed below.

Firstly, the investigation of outsourcing relationship could cover the client and vendor’s perspectives. Then, the results could be generated from the comparing with the both sides. This is better for researcher to investigate the conflicts of the relationship and find out the potential solutions.

Secondly, it is normal that there is an understanding gap between the IT employees and the end-user. The research of change requirements management could involve the end-user as the participant. Because this role is the real operator, he can supply more appropriate opinions about the changes applications.

Finally, if the research time is enough, it is better that the investigation cover the whole IT scope of the case company. In fact, a more broad survey on this topic could lead the result to be more convinced.

Word Count: 16,785
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Appendix A: Interview Question

Interviewee: IT Decision-Maker

Outsourcing Relationship

1. What are the main reasons for IT outsourcing? Please explain it.
   - Improve customer service
   - Cost reduction
   - Improve technique level
   - Business strategy
   - Technology innovation
   - System conversion

2. What’s the type of IT outsourcing in the company? Please explain it.
   - Total Outsourcing
   - Selective outsourcing
   - Project outsourcing

3. How much the budget of outsourcing in last year and this year? What is the reason for the change?

4. Please describe the outsourcing contract, including the duration.

5. What are the objectives of IT outsourcing in the company?
   - Infrastructure set and maintenance
   - Operation support
   - Application development and maintenance
   - System integration
   - System planning and design

6. Does this company make comprehensive strategy for IT outsourcing? If yes, please explain the outsourcing plan.

7. What are the vendor selection criteria in the company?
8. How do you communicate about IT outsourcing with the internal employees?

9. How to establish the outsourcing relationship with vendors?
   - Economic aspect: cost
   - Organizational aspect: culture, leadership, aims.
   - Standard aspect: expectation

10. How control IT system or IT project after outsourcing? And, how do you estimate the outcome from IT outsourcing project?

11. How about the user’s satisfaction for IT department? Does IT outsourcing assist in raising the satisfaction?

12. Do you have any recommendation and expectation for IT outsourcing in the future?

**Requirement Change Management**

13. Is there any strategy or policy established for requirements change management? And, is there any team to handle the requirements change management? If yes, please explain it.

14. Does the IT department loss the flexibility of requirement change management in outsourcing projects?

15. How you think the association between outsourcing relationship and requirements change management?
Appendix B: Interview Question

Interviewee: IT staff

Outsourcing Relationship

1. What are the main reasons for IT outsourcing? Please explain it.
   - Improve customer service
   - Cost reduction
   - Improve technique level
   - Business strategy
   - Technology innovation
   - System conversion

2. How to maintain the outsourcing relationship?

3. What are the vendor selection criteria in the company?

4. How to communicate with the internal employees in the outsourcing project?

5. What are the check points in the IT outsourcing project? And, how do you estimate the outcome from IT outsourcing project?

6. How about the user’s satisfaction for IT department? Does IT outsourcing assist in raising the satisfaction?

7. Do you have any recommendation and expectation for IT outsourcing in the future?

Requirement Change Management

8. How to control the change requirements? Is it based on policy or personal experiences?

9. Please list the causes and impacts of change requirements based on your
experiences. How to trace the change requirements?

10. Does the IT department loss the flexibility of requirement change management in outsourcing projects?

11. How to communicate the change requirements with vendor and internal employees?

12. How to handle the change requirements when the project resources limited?

13. How you think the association between outsourcing relationship and requirements change management?