THE INFLUENCE OF INTER-FIRM RELATIONSHIPS AND ROUTINES ON SERVICE DEVELOPMENT: A STUDY OF TAIWANESE CONVENIENCE STORES

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DECLARATION

I hereby declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

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SUMMARY

This thesis examines how inter-firm relationships and routines influence the process and outcomes of new service development (NSD). The research questions addressed are: 1) How do inter-firm relationships and routines influence the speed of NSD? and 2) In what ways do the different types of service development affect inter-firm relationships and organisational routines associated with the speed of NSD? Prior research has emphasized the importance of cooperating with other organizations to exploit external sources of knowledge and capabilities, but relatively little is known about the specific mechanisms to achieve this and how these affect the outcomes of new service development. This research contributes to the literature on new service development and innovation networks.

The research design consists of comparative case studies and draws on empirical evidence from the development of two contrasting e-commerce services in the four dominant Taiwanese convenience store chains. In total 52 interviews were conducted with members of staff of convenience store chains and suppliers. The interviews were analyzed using the thematic framework approach, which represents the patterns and relationships in the interview data. Cross-case synthesis was chosen as the analytical technique to summarize the findings from the individual cases.

The present study found that trust and interdependence have positive influence on the speed of NSD. Intensity of inter-firm collaboration has a negative effect on the speed of NSD under some circumstances (e.g. task complexity and project newness). Moreover, the relationship between organizational routines for knowledge transfer and the speed of NSD may vary under different degrees of project newness. The thesis demonstrates the interaction of organizational and project level characteristics in new service development, and the multi-dimensional nature of service development compared to that of conventional product development.

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Chapter 1: Introduction

1.1 Position of the research

The aim of this thesis is to contribute to a better understanding of the way in which firms adopt different inter-firm relationships with suppliers and why; and which organizational routines are adopted by firms in order to transfer knowledge in different types of new service development. More specifically, this thesis examines how inter-firm relationships and organizational routines influence the outcome of new service developments across different types of new service development.

Due to short product life cycle, firms are drawing more frequently upon external sources of knowledge to accelerate innovation (Bartlett *et al*., 2008). Collaborating with external companies provides focal firms with more flexible access to valuable knowledge/resources which it can contribute to new product development when it has limited internal resources and products are increasing in complexity and novelty. According to von Hippel's research (1988), suppliers, customers and competitors are the main sources of innovation to contribute new product development. When firms cooperate with external actors (e.g. suppliers, customers and competitors) to develop new services, they may need to access different types of network and use different types and degrees of inter-firm relations in order to acquire related resources/knowledge for this purpose. According to the previous innovation literature, these studies emphasize the value of cooperation with external actors to acquire complementary knowledge/ resources and to reduce the risks of development (Faulkner, 1995; Tidd and Bessant, 2009). The literature identifies different forms of collaboration between collaborative firms, such as licensing, technology acquisition, strategic alliance and joint venture (van de Vrande *et al*., 2006; Tidd and Bessant, 2009). The choice and constitution of different forms and the degree of inter-firm relations have been widely discussed on the basis of various academic theories, such as transaction-cost theory and resource-dependence theory. For example, focal firms, to reduce opportunism and transaction cost, should establish different forms and degrees of inter-firm relations, such as formal contract and trust, in terms of the degree of the asset specificity their partner firms provide (Williamson, 1975; 1985). From the resource-dependence viewpoint, focal firms may establish different forms and degrees of inter-firm relations in order to acquire essential

resources for creating and sustaining value (Pfeffer and Salancik, 1978).

Recently, Chesbrough (2003) has proposed the open business model, which, compared with traditional business models, can help a firm reduce the development cost and time of innovation by tapping into external sources of knowledge and leveraging external knowledge in different phrases of new product development. Cooperating with other companies shortens the time and cost spent on entering new business markets through leveraging partners' expertise and their channels. Although many advantages of open innovation have been identified from previous studies (Chesbrough, 2003; West and Gallagher, 2006) and empirical evidence in new product development has been drawn upon (Fetterhoff and Voelkel, 2006; Dittrich and Duysters, 2007), some potential problems also need to be considered, such as the leakage of sensitive knowledge and increased transaction cost (e.g. searching and monitoring cost). Previous studies argue that the process of new product development in the business world cannot be seen as a simple dichotomy between open and closed approaches (Dahlander and Gann, 2007; Trott and Hartmann, 2009). Firms often adopt a different degree of openness in inter-firm collaboration with their external partners in order to acquire valuable resources/knowledge in new product development. For example, firms may cooperate closely with external firms because it makes for easier coordination and control in terms of existing relations between firms (e.g. interdependence and trust). Accordingly, it is less well understood how firms adopt appropriate degrees of openness and forms in inter-firm collaboration in their contributions to the open innovation process. Recently, Birkinshaw (2007) has suggested that the issues of distribution of knowledge (concentrated vs. dispersed), degree of control and degree of trust and reciprocity are essential considerations when developing an approach of open innovation. This issue needs more empirical evidence, in particular in the process of developing new services.

Moreover, collaborative relationships with external firms can help focal firms to acquire the knowledge they need to contribute to developing new products/services. The connection between different inter-firm relationships (e.g. collaboration intensity, dependence and trust) and development outcome has also been discussed in previous studies (e.g. Littler *et al*., 1998; Takeishi, 2001; Von Corswant and Tunälv, 2002; Bstieler, 2006; Fliess and Becker, 2006; Cousins and Lawson, 2007). A few studies have gone further and found that the connection between different inter-firm relations and the

development outcome may depend on different degrees of project complexity (Meyer and Utterback, 1995; Griffin, 1997) and project novelty (Eisenhardt and Tabrizi, 1995; Ragatz *et al.*, 2002). Accordingly, the connection between inter-firm relationships and development outcome is likely to vary in certain circumstances (e.g. project complexity and newness) in this context. The above discussion shows why the main investigations into the development of new products have concentrated on how and why focal firms adopt different degrees and types of inter-firm relationship and the association of their choice with performance outcome. How and why different forms and degrees of inter-firm relationships exist between firms in developing new services is a question still being debated. The reason for this is perhaps that traditional innovation research mainly focused on the part played by adopting and prompting new technology and tangible artifacts in new product developments. More specifically, how this issue is associated with the outcomes of new service developments should be further investigated.

Furthermore, the issue of establishing inter-firm relationships to acquire complementary resource and knowledge can be seen as external relations to contribute new product/ service development. Previous studies suggest that focal firms need to develop routines and in-source mechanisms for knowledge transfer between firms and within a firm to access and assimilate valuable resources and facilitate an open innovation process (Dalander and Gann, 2007; Vanhaverbeke, et al., 2007). This is because valuable knowledge/resources cannot flow automatically into the innovation process of focal firms and flow out again to contribute to the value creation activities of external firms. Accordingly, the issue of which routines/in-source mechanisms focal firms adopt to transfer knowledge between firms and further make this knowledge flow to the appropriate departments and staff within focal firms needs to be further investigated in the process of new service development.

This thesis explores the research issues mentioned above by applying them to a highly competitive industry, namely, the Taiwanese convenience store industry. In order to attract and retain customers, Taiwanese convenience store chains compete to introduce new services quickly. To this end, convenience store chains must integrate multiple sources of knowledge within their firms or outside the firms' boundaries to develop and launch the new services speedily. They often collaborate by adopting different forms and degrees of inter-firm relationships with external companies from which the stores

can acquire the necessary knowledge or resources for creating innovative services. In addition, they combine such newly acquired resources with their existing advantages (24-hour service, high density of store spread, robust information systems and professional distribution systems) to carry out “Clicks and Mortar” services, which, in turn, help them respond quickly to market dynamics and consumers’ needs.

The present research draws empirical evidence from the Taiwanese convenience store industry and provides insights into inter-firm relationships and organizational routines in the process of new service development. It is hoped that the study contributes to our understanding of the connection between inter-firm relations and the outcome in new service developments of different kinds. Moreover, it also offers a better insight into the types of organizational routines for knowledge transfer in the process of new service development and the way in which this issue is associated with the development outcome.

1.2 Research objectives and research questions

The present research aims to investigate the issues of how and why Taiwanese convenience store chains use different types and degrees of inter-firm relationships with external firms to shape new service developments which acquire essential, complementary resource/knowledge to create value and minimize relational risks. Although the issue of why and how focal firms adopt different forms and degrees of inter-firm relationships with partner firms has been widely investigated in the previous literature on new product development, this issue is still being debated on new service development. The adoption of different degrees and forms of inter-firm relationships with different suppliers may contribute to better understanding of what constitutes an appropriate degree of openness with suppliers in the open innovation approach. In addition, the previous literature regarding product innovation also discussed the connection between different inter-firm relationships and development outcome and clarified some factors which may influence this relationship, such as project complexity and newness. This issue, however, still lacks enough empirical evidence and discussion to confirm very much in the process of new service development. Moreover, external relations and organizational routines for knowledge transfer are equally important elements in new service development. The issue of which in-source routines/mechanisms focal firms should adopt for knowledge transfer and how this

choice influences the development outcome needs to be investigated in this context in order to understand how focal firms use different routines for knowledge transfer at different levels (inter-organizational and intra-organizational).

Based on the above research objectives, this thesis focuses on the following main research questions:

1. How do different types and degrees of inter-firm relationships influence the outcome of new service development?
2. How do different types of organizational routine influence the outcome of new service development?
3. In what ways do the different types of service development affect the different types of inter-firm relationships and organizational routines associated with the outcome of new service development?

1.3 Research design

This research uses a comparative case study design, which facilitates an empirical inquiry into a contemporary phenomenon in Taiwan, drawing on empirical evidence from its four convenience store chains. In addressing the research questions, two e-commerce services (i.e. the online shopping with pick-up at store service and the multiple media kiosk service) in the convenience store industry were selected. In order to test the logic of the initial research design, two of the convenience store chains in Taiwan were selected as pilot cases in preparing for a full-scale investigation. It also helped the research to reveal and identify more specific and relevant factors in the perspectives on inter-firm relations in the co-operation between Taiwanese convenience store chains and suppliers in the development of new services. Additionally, semi-structured interviews were conducted with project managers, the section staff of the convenience stores and the project managers of the suppliers, in order to fully understand the development process of the services in question and increase the creditability of the present research. In total, this research entailed 52 interviews, conducted with 42 interviewees. Some informants were interviewed twice, once in the pilot study in order to understand the development process of selected services and once to identify specific perspectives on the inter-firm relationship and organizational routine in selected service developments. The interviews were analyzed using a thematic

framework to guide the initial data analysis in this enquiry. Moreover, cross-case synthesis was chosen as the analytical technique to summarize the findings from the individual cases and to identify the similarities and differences between the four chains.

1.4 Outline of the thesis

A brief outline of the thesis is presented in this section. **Chapter 1** discusses the research motivations and identifies the research gap in the literature on open innovation. Then the research objectives and research questions which underpin the thesis are introduced. Finally, the elements of the research design, including the study population, unit of analysis and methods of data collection and analysis are briefly introduced.

Chapter 2 provides a theoretical background which takes into account the potential problems of inter-firm collaboration; this leads to the development of a theoretical framework, which is developed in Chapter 3 and further used to investigate the research questions in the Taiwanese convenience store industry. First, this chapter reviews the context of open innovation and the existing literature related to inter-firm collaboration to take account of the potential problems of the open innovation process of creating value creation. Then the sectoral system of innovation and innovation in the service sector are reviewed and further used to identify the sources of innovation and interaction of links between convenience store chains and their partner firms within the industry developed in Chapter 5. Finally, the literature regarding organizational routine is reviewed to understand the concept, characteristics and mechanisms of organizational routine.

Chapter 3 is built on the literature review in Chapter 2. This chapter aims to develop a theoretical framework to investigate the research questions, in particular identifying the main factors of inter-firm relationship which contribute the new service developments and what their influence is on the outcome of new service development. Moreover, different dimensions of service innovation are identified to classify the two selected services. The different aspects of measuring in new service developments are also identified and selected in this chapter. It ends by reviewing the influence of organizational routine on organizations in order to set out some expectations on the relationship between organizational routine and the outcome of new service

development.

Chapter 4 focuses on the methodological issues. The research strategy is adopted to investigate the theoretical framework developed in Chapter 3. It addresses the following issues: the research paradigm, research design, study population, unit of analysis, methods of data collection, and data analysis which are employed in different stages of the research process (pilot study and full-scale fieldwork).

Chapter 5 introduces the characteristics of the Taiwanese convenience store industry and adopts a sectoral system of innovation to identify the sources of innovation and the interaction of links between the convenience store chains and their partners. The two selected service developments are also introduced in this chapter and further classified under different dimensions of service innovation.

Chapter 6 is the first empirical chapter. This chapter discusses how Taiwanese convenience store chains adopt different degrees of intensity of inter-firm collaboration with different suppliers in the two selected service developments. The relationship between the intensity of the inter-firm collaboration and the speed of new service development is further explored in the two selected service developments and the similarities and differences between the two service developments are explored.

Chapter 7 separates into two parts to discuss the factors of interdependence and trust between firms. This chapter first illustrates the different interdependent relationships between convenience store chains and their suppliers in the two selected service developments. Then the relationship between interdependence and the speed of new service development is discussed with reference to the two selected service developments and the similarities and differences between them are explored. Moreover, this research also describes the different types of trust between convenience store chains and their suppliers in this context. The influence of trust on the speed of new service development is further explored in the two selected service developments and the similarities and differences between them are explored.

Chapter 8 describes how case companies adopt different types of organizational routine for knowledge transfer between firms and within convenience store chains in the

process of two service developments. The effect of organizational routine on the speed of developing a new service is also examined in this context and the two selected services are compared to expose similarities and differences.

Chapter 9 summarizes the main research findings of the empirical work and suggests some managerial implication. The limitations of the thesis and suggestions for future research are also set out in this chapter.

Chapter 2: Literature review

2.1 Introduction

Chesbrough (2003) proposed the concept of an open business model, as opposed to the traditional (closed) business model and argued that an open business model could help a firm reduce the development costs of innovation, shorten the time needed to enter a new market and thus make it easier to create value in a new product or service and bring additional value to a firm by collaborating with other companies. Open innovation encourages a firm to source valuable knowledge/resources from external firms or share the internal, valuable knowledge/resources of external firms in order to create value. According to previous studies, inter-firm cooperation has been found in the literature on product innovation, formed by different types of inter-firm relationship (e.g. licensing, joint venture, strategic alliance and value network) in the innovation process (Dittrich, 2004; van de Vrande *et al*., 2006; Dittrich and Duyster, 2007; Tidd and Bessant, 2009). These different types of inter-firm relations may be identified by the different degrees of openness in their cooperation with one another and empirical evidence of this has been found, in high-tech industries in particular. The question of which aspect of open innovation can be applied in a new service development is still being debated. Moreover, cooperative firms need to acquire essential resource/knowledge from their partners or share valuable knowledge with them for innovation purposes when they establish different types and degrees of inter-firm relationship. The question of how a focal firm make the valuable knowledge/resources flow freely between firms and within itself should also be considered, because these kinds of important knowledge/resource do not automatically flow to the appropriate organizations and individuals when the innovating firm cooperates with external partners. Accordingly, this chapter first reviews the concept and advantages of the open innovation model as found in previous studies. Then the concept of open innovation is compared with other current theories, namely, transaction-cost theory, resource-based theory, transaction-value theory, relation theory, and resource dependence theory as they apply to transactions and resource combinations between partner firms; and the similarities and differences between these theories are examined. These theories also provide some ideas and governance modes (e.g. trust and transaction specific assets) which can be applied to reduce the risks of inter-organizational cooperation.

Second, the open innovation model suggests that a firm should collaborate and share its valuable knowledge/resources with external companies, so as to take internal ideas to market by means of external paths (Chesbrough, 2006). When a firm cooperates with external actors to develop new products/services, it may need to access different types of network and use different types of collaboration in order to acquire related resources/knowledge in the process of developing new products/services. However, previous research has found some evidence in the existing literature of innovation that a firm has adopted on the basis of managing different types and degrees of inter-firm relationship with external companies in order to create value, which has involved different degrees of openness for innovation purposes (von Hippel, 1988, van de Vrande et al., 2006; Dittrich and Duyster, 2007; Tidd and Bessant, 2009). This chapter reviews the literature from networks and collaborations in innovation to understand how a focal firm can use and manage different inter-firm relationships with external firms in the process of new products/services and has compared them with open innovation. The sectoral systems of innovation and innovation in the service sector are reviewed and further employed to identify the source of innovation.

Third, the open innovation model emphasizes why a firm acquires valuable resources from external firms and shares internal resources for new product/service development. But the question of how a firm sources external knowledge and shares internal knowledge in inter-firm collaboration is still unanswered. This is because external and internal knowledge/resource in order to create value does not automatically flow into the focal firm or flow out to external firms. Vanhaverbeke et al. (2007) argue that a firm should develop routines and structures for knowledge transfer in order to access and assimilate valuable resources and facilitate the open innovation process. This means that a firm has to develop routines for knowledge to flow between firms and within a firm and contribute to new product/service development. Therefore, the final section seeks to connect the concepts of open innovation and a routine for achieving it. A diagram of theoretical review is provided in Figure 2.1 to show which theories are closely related to this research in order to offer a theoretical basis for building up a research framework.

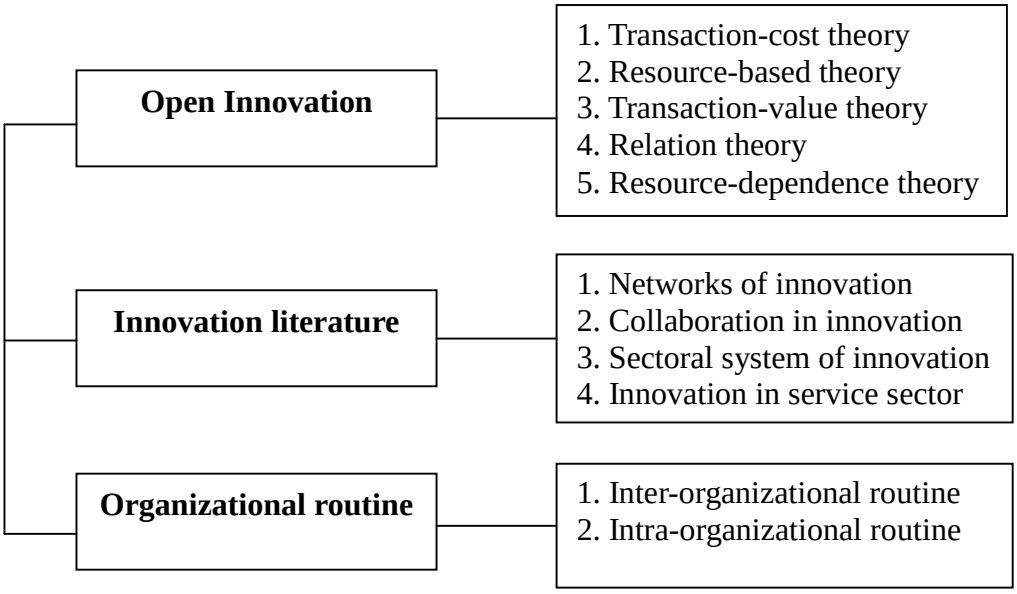

Figure 2.1: Diagram for a theoretical review
Source: Summarized by the author

2.2 Open innovation

Open innovation can be seen as encouraging and searching for innovation opportunities from a broad range of internal and external resources and then assimilating these within a firm's capabilities and sources for delivering these opportunities via internal or external channels (West and Gallagher, 2006). Within the closed business model, firms recruit talented, intelligent people and invest much in R&D activities, which themselves develop and produce new business, in order to secure the market first and outperform their competitors in their field. This implies that successful innovation relies on control from the focal firm. The firm tends to control everything and invests in R&D activities to develop new projects internally in order to prevent its competitors from profiting from its ideas. In terms of specific knowledge related to product/service development which is widely distributed over different types of actor, different companies must be involved in contributing to it. The open business model can reduce the costs of developing an innovation by using external knowledge to tap into a firm's innovation process and can reduce the time taken to enter another market by adopting external channels to catch additional revenue. More specifically, open innovation facilitates new product/ service creation and brings additional value to a firm or group of firms by aiding collaboration with external companies, with a view to taking internal immature or complementary technology to the market. External knowledge in the open innovation

paradigm shows an equivalent role, which means that external knowledge not only complements internal knowledge, but also provides a firm with the chance to enter a new market and capture additional income from the immature or complementary technology, which on its own would have had no route to the market, via the new product or service created by the external company (Chesbrough, 2006). Open innovation captures additional value between the focal firm and the external company, which allows companies to be more successful. In open innovation, firms must first recognize and access the external knowledge/resources that they need, using different ways to share internal innovation so that other companies can share the added value. To access a network allows a firm quickly to get specific knowledge/resources from external firms without spending much time or money on developing it itself, facilitating its efforts through different ways, such as spin-offs or joint ventures to commercialize its existing knowledge/resources.

According to the concept of open innovation mentioned above, Vanhaverbeke et al (2007) argue that open innovation can be separated into different dimensions, including value creation and capturing, inter-organizational transaction, market and technology uncertainty, and the inter-organizational combination of resources and competences which are involved in different management theories (e.g. transaction cost theory, transaction value theory, resource-based theory, relation view). They propose that existing management theories can be used to partly explain the phenomenon of open innovation. This section briefly introduces some different management theories and compares them with the concept of open innovation. First, transaction cost and transaction value theories are used to discuss inter-organizational transactions and contrast them with the concept of open innovation. The open business model encourages a firm to cooperate with external firms to reduce development costs and time but it may also increase the opportunistic behaviours in inter-organizational transactions. Transaction cost theory emphasizes the chance to reduce the risk of opportunism, while minimizing transaction costs leads to transaction efficiency (Williamson, 1975). Transaction cost can be incurred from searching, bargaining, contracting, monitoring and enforcement. The first three occur before any transaction between firms and the last two afterwards. Relationships between the firms within value system always focus on price negotiation between them, which in this area are called “arm’s-length transactions”. Furthermore, Williamson (1985) also emphasizes that the

degree of asset specificity influences the choice of governance structure for transactions. A firm may use contractual or organizational safeguards to protect its specific assets investment and against the risk of opportunistic behaviour, bounded rationality and environmental uncertainty. Previous research also finds that focal firm use formal safeguards (e.g. transaction specific assets) and informal safeguards (e.g. goodwill trust to govern inter-firm transaction in the automobile industry (Dyer, 1997). The perspective of transaction-cost theory on the collaborative relationship between firms provides an insight into specific asset investments, partners' motivation and the choice of governance modes in the transaction.

Regarding the transaction value in inter-firm transactions, Vanhaverbeke et al (2007) argue that open innovation focuses on maximizing transaction value rather than minimizing transaction cost, according to previous research regarding the transaction value approach (e.g. Dyer, 1997; Zajac and Olson, 1993). The concept of open innovation emphasizes that firms cooperate with external actors to create value by establishing numbers of non arm's-length transactions, because firms within the value network see transaction costs as an investment in potential value. According to transaction-value theory, in transactions between firms each focuses on maximizing transaction value and ignoring cost differential. This theory argues that revenues can be further increased by creating a bundle of value assets. Firms have to allow transaction cost to increase, given that added cost can be seen as an investment in a venture, which can earn revenues in the future. However, both approaches (open innovation and transaction value) to inter-organizational transactions mainly focus on the process of maximizing the transaction value rather than reducing transaction cost.

Moreover, the concept of open innovation emphasizes that specific/valuable knowledge can inflow or outflow between firms to create for value. Resources, knowledge and competence should also be considered in the process of value creation. This is clearly related to existing management theories, including resource-based theory and knowledge-based theory. The open innovation model proposes that valuable resources/knowledge cannot create value if they are locked within a firm, which means that valuable resources/knowledge from different companies should be combined in order to create value. According to the resource-based view, this theory underlines that a firm should create and sustain its competitive advantages or capabilities on the

basis of acquiring, owning and controlling unique or specific resource/knowledge within a firm's boundaries. This is because a firm has to occupy a specific position in a value system and leave valuable resources/knowledge for the next actors to use. A firm's competitive advantage can be created only if a firm has strategic resources, such as assets, skills, capabilities and knowledge, which have the characteristics of being unique, valuable and inimitable. In the marketplace, the unique property, value-creating process and structure result in the strategic resource being seen as rare and difficult to replicate by external firms. Grant (1996) also further proposes that knowledge is the most important resource of the firm and should be locked within firm's boundaries in order to create and sustain competitive advantage in a value chain.

With regard to the effect of inter-firm relations in the process of value creation, open innovation emphasizes that to acquire valuable resources a firm can establish different relationships with different partners and this leads to value creation. Gassmann and Enkel (2004) argue that firms must have a relational capability to cooperate with their partners, because firms use strategic alliances and an innovation network to co-develop new technology, products and services with partners in a coupling process. The relational capability is similar to the relational view which Dyer and Singh (1998) propose: that a firm's joint development with a partner receives great value from their cooperation, which offers the capacity to establish and sustain relationships between partners. This theory argues that relational rents between collaborative firms can be generated by relation-specific assets, knowledge-sharing routines, complementary resource endowments and effective governance. Moreover, the relational review gives open innovation the space to explore inter-firm linkage in order to create value between independent companies.

Finally, resource-dependence theory is also reviewed, to understand how to establish and sustain inter-firm relations in order to acquire essential resources for the purpose of innovation. This perspective considers the motivations of actors in alliances, comparing them to theories with an economic perspective. The resource-dependence theory considers the arrangements which are negotiated between certain actors (e.g. external stakeholders, partner firms and organization managers) who contribute the related resources for creating value and receiving profit from the value created. The degree of dependence is determined by the amount of valuable resources required and the number

of market alternatives (Pfeffer and Salancik, 1978). Resource scarcity prompts a firm to establish inter-organizational relationships to control the necessary resources from other firms, using its power, influence and control. The resource-dependence approach also allows us to understand the relationship between resource provision and control within alliances. According to resource-dependence theory, a firm establishes different inter-firm relations with partners to acquire the essential resources in order to create value and sustains the created value by its control mechanisms.

On the basis of the above comparisons between the concept of open innovation and the other theories, this thesis summarizes the main differences/similarities in Table 2.1. The cross-theory comparison gives a clearer idea of the connections between open innovation and the other management theories.

Table 2.1: The theoretical comparisons among the concept of open innovation and existed theories

Open innovation	**Transaction-cost view**
Non arm's-length transactions. Transaction costs between firms in a value network could be seen as an investment for the sake of future value. This concentrates on the process of creating and distributing value.	**Arm-length transactions** This focuses on the governance structure of the transaction in order to deal with the problems of opportunistic behaviour and uncertainty; it leads to lower transaction cost.
Open innovation	**Resource-based and knowledge-based view**
Complementary The value of resources/knowledge for commercialization which could inflow or outflow over the boundaries of a single firm in terms of interdependence of complementary between firms.	**Unique, lock-in.** A firm creates and controls its unique, valuable resources/knowledge within itself in order to create and sustain competitive advantage in the process of value creation.
Open innovation	**Relational view**
The concept of open innovation proposes the importance of collaboration with other firms in order to create added value and save time.	The relational view considers that a firm's resource/knowledge may span a firm's boundaries. It also emphasizes that inter-firm linkages such as inter-firm routines for knowledge sharing and governance modes between firms in order to create value is an important source of competitive advantage. This in turn suggests that relationships between

	firms become an important unit of analysis for realizing and clarifying profit return. This relational view sheds light on open innovation, clarifying how to use different inter-firm relations to achieve efficient collaboration.
Open innovation	**Resource-dependence view**
The concept of open innovation only emphasizes the ways to use different types of collaboration with external actors to acquire valuable resources and knowledge for commercializing. The question of how to manage the required resources and avoid needless transaction cost is still being debated.	This perspective emphasizes that firms establish different relationships with other actors in order to acquire and deploy their required resources. This theory can provide some ideas whereby for open innovation can learn how to control the required resources.

Source: Summarized by the author

The concept of open innovation encourages a firm to acquire complementary resources from external firms and share its relevant resources in order to create value at different stages of the innovation process. This means that, for value creation, resources, knowledge and individuals can inflow and outflow between different companies. However, some studies argue the weakness of open innovation and criticize it as a concept (Dahlander and Gann, 2007; Trott and Hartmann, 2009; Lazzarotti and Manzini, 2009). Some writers argue that adopting the open innovation model may lead to the leakage of commercially sensitive knowledge, because it encourages firms to share their valuable knowledge/resources with external companies for commercialization (Trott and Hartmann, 2009). Moreover, Lazzarotti and Manzini (2009) also propose that adopting an open business model may increase the cost, because of searching and testing several solutions with external firms in the innovation process. They also argue that if the number of participating firm increases, the coordination and control between firms may also increase based on the transaction cost view. It would be interesting to explore what kinds of cooperation mechanisms are appropriate in the process of open innovation. This is because the concept of open innovation does not specify in advance how to manage the collaboration between firms in order to reduce such potential risks as hold-up risk and spillover risk. Von Zedtwitz and Gassmann (2002) argue that firms need some degree of control, such as formal or informal relationships with partners in order to implement open innovation activities. Moreover, van de Vrande et al. (2006)

examine the choice of governance modes for external technology sourcing with external partners in terms of different degrees of uncertainty. They propose that, under a high level of technological and market uncertainty, less hierarchical governance modes should be adopted.

In addition, some studies argue that the concept of open innovation, while a new concept on theoretical grounds, can be found in practice in many firms and industries (Trott and Hartmann, 2009). The concept of open innovation can be found in previous studies on innovation management which emphasize cooperation with external actors in order to acquire and share complementary knowledge/resources and to reduce development risks, showing that the innovation process often involves different degrees of openness (von Hippel, 1988; Faulkner, 1995; Tidd and Bessant, 2009). Firms in different industries can be found to adopt different types of cooperation and alliance, such as licensing, outsourcing, joint venture, industrial cluster and innovation networks. Moreover, some studies argue that the concept cannot be separated into a simple dichotomy between open and closed approaches (Dahlander and Gann, 2007; Trott and Hartmann, 2009). These studies suggest that further research should pay more attention to exploring the different degrees and types of openness and the extent to which a firm can benefit from external and internal resource/knowledge in the innovation process. This view provides an opportunity to investigate the use of various collaboration strategies open to a company and the types and contexts of sources of innovation (Lazzarotti and Manzini, 2009). Recently, some studies have begun to identify different types of openness (Dahlander and Gann, 2007; Lichtenthaler, 2008). For example, Dahlander and Gann (2007) claim that there are three types of openness, taking into account: 1) appropriability – different degrees of formal and informal protection; 2) the number of sources of external innovation; and 3) formal and informal relationships with external actors. Lichtenthaler (2008) also defines two dimensions, the extent of external technology acquisition and the extent of external technology exploitation, to investigate a company's behaviour in the innovation process. Furthermore, Birkinshaw (2007) proposes that a hybrid open model, between a traditional closed model and a fully open model, may exist. Some characteristics can be used to analyze a firm's conditions, such as more concentrated or dispersed knowledge, different degrees of control and different degrees of trust and reciprocity. This framework lets us examine how firms develop appropriate relationships with external partners in order to create value. The framework

is shown in Figure 2.2.

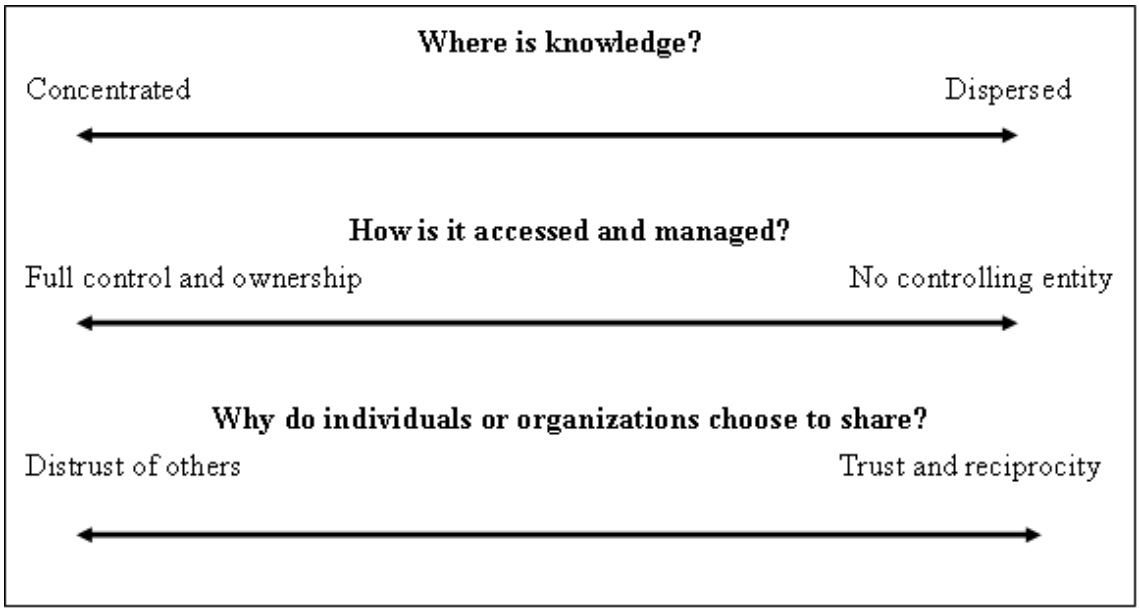

Figure 2.2: A research framework for open innovation
Source: Birkinshaw, J. (2007) Open Innovation and in-sourcing of external technologies, EURAM conference

Recently, many researchers have written on the open innovation approach. Fredberg et al. (2008) review previous studies of open innovation and sub-divide them into seven categories: 1) the notion of open innovation, 2) business models, 3) organizational design and boundaries of the firm, 4) leadership and culture, 5) tools and technologies, 6) IP, patenting and appropriation, and 7) industrial dynamics and manufacturing. This research provides a thematic analysis which could be used to categorize and analyze the previous studies of open innovation along different dimensions. The present thesis summarizes these categories in Table 2.2. Moreover, Fredberg et al. (2008) also list some lines of enquiry observe some which could help in the future to further investigate open innovation, including: 1) the dimension of open innovation (e.g. the locus of the innovation process, the extent of collaboration and the complexity of open innovation); 2) the human side of open innovation (e.g. leadership, team work and motivation); and 3) the organizational side of open innovation (e.g. organizational structures, open innovation capabilities and open innovation process). In addition, Gassmann et al. (2010) also identify some trends in open innovation which further research may focus on, some related to the content of this thesis. For example, they propose that in value creation innovation structure may move from standalone to alliances. They also suggest that

most of the research on open innovation mainly concentrates on product innovation the service sector is still being developed.

Table 2.2: Different categories in the literature of open innovation

Category	Context in each category
The notion of open innovation	This category focuses on identifying the definition, themes and challenges of open innovation. It also shows why open innovation is very important and how to achieve it.
Business models	This category focuses on comparing the differences between the open and the closed business models and further emphasizes the importance of co-development partnership (peers).
Organizational design and the boundaries of the firm	This category argues that many companies practice different degrees of openness in innovative activities. The open innovation process involves many participants in its innovative activities, using ties of different types between firms in the value network.
Leadership and culture	This category argues that leadership has to give workers support in order to achieve innovative activities.
Tools and technologies	This category shows the importance of the customer's needs and argues that a firm uses a technological interface (tool) to meet these needs and involve customers as cooperators in developing innovative activities.
IP, patenting and appropriation	This category discusses how a firm manages and protects its intellectual capital in the open innovation process in order to exploit valuable resources/knowledge and sustain its competitive advantage.
Industrial dynamics and manufacturing	This category argues that many previous works have focused on the firm level. The network or industrial level analysis has to be applied in further open innovation research.

Source: Summarized by the author

Section 2.2 identifies and connects the concept of open innovation with existing management theories to identify the similarities and differences in different dimensions (including value creation and capturing, inter-organizational transactions and inter-organizational combinations of resources and competences). It also criticizes open

innovation as an approach, categorizes existing publications regarding open innovation in different dimensions and addresses future research. The following two parts review the existing innovation literature from the network and collaboration perspective in turn in order to provide insight into the use of the inter-firm relationship in developing new product/service processes.

2.3 Networks of innovation

In general, the locus for innovation is increasingly considered to be the network in which a firm is embedded (Powell et al., 1996). A network is defined as a set of 'patterned relationships between individuals, groups and organisations' (Dubini and Aldrich, 1991). The advantages of being embedded in a network include social as well as economic benefits, in terms of better opportunities to reduce transaction cost and to create resource value by gaining complementary advantages in learning and resources (Dyer and Singh, 1998). Tidd and Bessant (2009) argue that a network can affect its actors through information sharing and the actors' different positions, triggering inequity power or control in terms of trust, expertise and technology, etc. The quantity, quality and types of interaction make networks tighter or looser. Hakansson and Waluszewski (2003) identify some types of interaction within networks, which include product interactions, process interactions, social interaction within the organization and social interaction between organizations.

Some previous studies have examined the different purposes (exploration and exploitation) of innovation which can be provided by different types of innovation network (Dittrich, 2004; Dittrich and Duyster, 2007). Exploration can be based on a closed, unconnected innovation network characterized by looking for new technological capabilities, weak ties, opportunistic behaviour/low commitment, economies of scale and non-equity agreements. The closed network tends to develop proprietary knowledge/resources in order to lock customers in and discourage new entrants. Exploitation can be provided by an open, connected innovation network which includes the characteristics of existing technological capabilities, strong ties, trust/high commitment, economies of scope, and equity agreement. The open network tends to share existing knowledge/resources and acquire complementary resources from external companies in order to enter different markets.

Reviewing the network literature, previous research can concentrate on one of three facets: tie strength, diversity and centrality. Some studies (e.g. Jack, 2005) argue that among these, ‘tie strength’ has probably attracted the most research attention and made important contributions towards understanding the network concept. Moreover, the notion of embeddedness was introduced by Granovetter (1973; 1985), to refer to the presence of strong and weak ties within a network. Strong ties and weak ties can be distinguished by their different capacities to diffuse knowledge/resources. Strong ties can provide access to important sources of knowledge and more ‘fine-grained’ and high quality information/knowledge (Powell, 1990; Uzzi 1997). In contrast, weak ties can help bridge structural holes but provide less redundant information/knowledge (Burt, 1992). In other words, the diverse capabilities and/or resources among network actors can provide the potential to enhance focal firms’ innovative capacity and business performance. What can be inferred here is that the extent to which a focal firm interacts with its network actors serves as a source of new knowledge. To effectively acquire and assimilate such new external knowledge depends on the focal firm’s relationships with its network actors. In particular, to absorb tacit and non-codified knowledge would require strong and established ties. In addition, weak ties can help a firm to identify and access the related knowledge.

Moreover, network ties also can be divided into formal and informal ties (Simard and West, 2006). A formal tie may represent formal collaboration between firms (e.g. licensing, contracting, joint venture and strategic alliance) in developing new products/services, which is often embedded in a social network (Gulati 1998). The informal tie can be built on the basis of previous collaborations between individuals, for example, on trust. This may play an essential role in an inter-organizational network by absorbing external, tacit knowledge into a focal firm’s internal knowledge repository. According to different dimensions of the network tie, Simard and West (2006) develop two dimensions of network ties which they name the deep vs. wide ties and the formal vs. informal ties, to provide a better insight into the role of inter-organizational ties in value networks. For instance, when ties are deep-formal, they offer a firm the potential to easily acquire knowledge/information but they need to distinguish knowledge which may be veiled by an employee’s’ informal interaction.

2.4 Collaboration in innovation

Many firms have established some forms of collaboration with other partners in innovative activities within manufacturing/service sectors in order to reduce the cost and risk of development or enter a new market, save development time and commercialize new products/services or achieve economies of scale and scope. Previous research has identified some forms of collaboration. For example, Tidd and Bessant (2009) suggest that inter-firm alliances can be either horizontal or vertical relationships. The vertical relationship includes subcontracting and supplier/consumer relationships, which can be used to control essential resources with partners. The horizontal relationship includes licensing, consortia and collaboration with competitors in order to acquire complementary resources. Moreover, van de Vrande et al. (2006) also argue that, traditional forms of external technology sourcing use merger and acquisition, strategic alliance, joint venture and licensing. A firm has a closer relationship with suppliers or customers to save the time and cost of developing new products/services through complementary know-how/resource sharing. Previously, such closer relationships were conventionally based on a short-term contractual agreement between firms for the purpose of acquiring complementary inputs of suppliers or customers in the development process. But many firms have begun to establish a long-term, mutual relationship with suppliers or customers with a view to reducing development cost and time and integrating their knowledge/resources in an earlier development process. According to these outlines of the reasons and forms of collaboration, complementary resources and knowledge can be acquired from suppliers, competitors, customers, universities and research units. Suppliers and users have always been regarded as important sources of innovation (von Hippel, 1988). By using a supplier's resources, a firm can develop its capacity and maintain a competitive advantage by reducing the cost and time needed for a customized service. Exploiting user involvement within the new service development process can also help to provide a more customized service to match customers' needs.

In the context of open innovation, to create value firms use different types of collaboration such as spin-off, alliance and joint venture with external actors. Firms also use different types of inter-organizational ties with partners to absorb related knowledge in value networks. Based on the accounts of networking and collaboration in the

innovation literature, the context of open innovation is rooted in the previous innovation literature. But the principles of the previous innovation literatures and open innovation are not all the same (Chesbrough, 2003). For example, a firm uses a traditional innovation model of employing talented people, to profit from internal R&D, get into the market first if it alone has discovered an innovation, win by being the first firm to commercialize it, win by creating the best ideas in its industry and control intellectual property in order to protect it from other companies who would like to profit from it. The context of open innovation considers that firms could never recruit all the people with talent to work for them because such people are spread all over the world. Thus the focus has to be on cooperating with complementary firms in order to create value in order to efficiently use each firm's resources and knowledge. Moreover, open innovation focuses on acquiring valuable knowledge/resources from other firms or individuals and tapping into the internal development process. This also emphasizes cooperating with external firm and building a best business model to create value which uses internal and external ideas to win. Open innovation can thus be seen as a paradigam for a firm to cooperate with external firms in order to create value. A firm can identify internal knowledge/ resources and then provide valuable knowledge/ resources to external firms or acquire complementary knowledge/resources from them for innovation purposes.

The context of open innovation encourages a firm to cooperate with external actors (e.g. suppliers, users, competitors, universities and research institutions) and make knowledge flow in and out in the process of value creation. The following section reviews the sectoral system of innovation in order to identify the source of innovation and linkages between actors in the Taiwanese convenience store industry.

2.5 Innovation by sector level analysis

Pavitt's work (1984) sets out sectoral patterns of technological change and a three part taxonomy of different trajectories: supplier dominated, production intensive (scale intensive and specialized suppliers) and science, based on an analysis of different sectors. Different activities generate different technological trajectories; these different trajectories can be characterized by the source of their technology, their users' needs or their means of appropriation, which are the determinants of technological trajectories.

The technological trajectories can be cost-cutting, product design or mixed. The measured characteristics for each category are the source of the process technology, product or process innovation, firm size and diversification. The determinants, directions and measured characteristics of technological trajectory in each category are shown in Table 2.3. The sectoral patterns of technological change clarify the sources and directions of technological change and firm size and diversification in analysis at the sectoral level. Kristensen (1999) adds two more categories, those of service specialized suppliers and information intensive which are based on Pavitt's taxonomy of patterns of innovation. This study further provides a learning regime for cross-sector analysis and offers learning in different ways within a given trajectory. The dominant ways are learning by searching, learning by doing, learning by using and learning by interacting.

Table 2.3: Sectoral technological trajectories

Category of firm		***Supplier-dominated***	***Production intensive***		***Science based***
			Scale intensive	**Specialized suppliers**	
Determinant of technological trajectories	**Source of technology**	Suppliers; Research extension; Big users	Suppliers; R&D	Design and development users	R&D; Public science
	Type of user	Price sensitive	Price sensitive	Performance sensitive	Mixed
	Means of appropriation	Non-technologi-cal	Process secrecy and know-how; technical lags; patents	Design know-how; knowledge of users; patents	R&D know-how; patents; Process secrecy and know-how
Technological trajectories		Cost-cutting	Cost-cutting (product design)	Product design	Mixed
Measured characteristics	**Source of process technology**	Suppliers	In-house; suppliers	In-house; customers	In-house; suppliers
	Product or process innovation	Process	Process	Product	Mixed
	Firm size	Small	Large	Small	Large
	Diversificati on	Low vertical	High vertical	Low concentric	Low vertical; High concentric

Source: Adapted from Pavitt, K. (1984) Sectoral Patterns of Technical Change: Towards a Taxonomy and a Theory, *Research Policy*, Vol. 13, pp354

Furthermore, Soete and Miozzo (1989) provide a taxonomy of services based on the service firms' technological connection with manufacturing firms and other service firms. Building on Pavitt's sectoral taxonomy, they go on to identify supplier-dominated sectors, scale-intensive physical network sectors, information network sectors and science-based and specialized supplier sectors. The determinants and measured characteristics of the technological trajectory in each category are shown in Table 2.4. Most innovation stems from the different types of supplier, which fall into the first category–supplier-dominated. The first subsector of the second category, scale-intensive services, mainly uses a physical network in order to achieve economies of scale and scope. These services rely heavily on the hardware technology developed by manufacturing industry. The second subsector of the second category, information network services, count mainly on using information networks, facilitated high customization and established standards in different service activities. The main source of technology comes from a firm's development activities in the final category (Science based and Specialized suppliers services). The outputs of service are often high customization for special customers. These three categories of service sector often belong to the technology-intensive sector which involves information storage and transformation and a high level of communication between the service provider and consumer. Hipp and Hariolf (2005) suggest that the above categories can be divided into four types of service, based on knowledge intensity, network basis, scale intensity and supplier dominance. Some writers argue that Soete and Miozzo's list of categorizations lack the following: a professional knowledge-based style, public service style and interactive style (Tether et al., 2002; Kanerva et al., 2006; Miles, 2008). The first style of service uses new IT intensively, applies professional knowledge in work and develops one-off specialized services for customers once. Large public organizations (e.g.: education, health care) develop their own R&D, make links with a university system and share higher level professional staff, unlike the supplier-dominated innovation in the private sector. The final styles of service refer to innovation activities which are often involved with customers.

Table 2.4: Taxonomy of patterns of innovation in a service firm

Category of firm		***Supplier-dominated***		***Scale-intensive physical networks and Information networks***		***Science based and Specialized suppliers***
		Personal service	Public and social service			
Typical sectors		Restaurants; Beauty	Education; Health	Transport; Wholesale	Finance; Communicati-on	Software; Specialized business service
Determinants of technological trajectories	**Source of technology**	Manufactur-ing	Both	Manufact-uring	Both	Service
	Type of user	Performanc e sensitive	Quality sensitive	Price sensitive		Performanc e sensitive
	Means of appropriation	Non-techno-logical	Not allowed, public	Standards; Norms		R&D know-how; skill; copyright; product differentiati on
Technological trajectories		Product design	Improving performance	Cost-cutting, networking		System design
Measured characteristics	**Source of process technology**	supplier	supplier	In-house; suppliers		In-house; Suppliers and customers
	Firm size	small	large	Large		small

Source: Adapted from Soete, L. and Miozzo, M. (1989) Trade and Development in Services: A Technological Perspective. *MERIT Research Memorandum*, p89-131

The taxonomy of patterns of innovation focuses on the industrial level and provides insights into firm size, source of process technology, a firm's diversification behaviour and the competitive parameters within the sectors. According to Malerba's definition (2004), a sector can be defined as a set of activities which are offered by some related actors for meeting consumer demand (product/service). These actors engage in market and non-market interactions, to do with the communication process, competition and cooperation shaped by the institution, an in these share their knowledge/resources to for create sectoral products. In Malerba's work (2004), the concept of the sectoral system of innovation has three key building blocks: knowledge and technology; actors and networks; and institutions. The various elements of the sectoral system have co-evolved through the process of transformation and change in order to create demand in the consumer. The different sectoral systems are characterized in terms of different technologies. The different technologies are based on various ways of constituting

knowledge. Knowledge plays an important part in technological change and innovation, where the emphasis of evolutionary theory lies (Nelson, 1995; Dosi, 1997) and that of the knowledge-based economic literature (Lundvall and Johnson, 1994; Cowan, David and Foray, 2000). Knowledge has some important dimensions of accessibility, opportunity and cumulativeness, which are important factors, conditioning the process of technological change and learning. Malerba and Oresnigo (1997) find that a technological regime is made up of cumulativeness, appropriability, opportunity and the characteristics of the related knowledge base. Different conditions of these elements result in different patterns of innovation; for example, a high degree of appropriability leads to more concentrated industry and fewer innovators. The second block is related to actors and networks, which is focused on the way in which these actors interact in a sector. The heterogeneous agents include users, suppliers, universities, financial organizations and government agencies. The unit of analysis can be an organization, individual, firm subunit or a group of firm. This also shows that suppliers play an important part in the innovation process; they have different types of relationship with firms and provide the specific knowledge/resources to permit innovation. The interactions of the actors in each sector constitute their market and non-market relationships which generate and transform knowledge for innovation purposes. The final block of the sectoral system is institutions, i.e. norms, rules, routines, habits and laws, which can be used to shape the cognition, interactions and actions of the various agents.

The sectoral system approach suggests that the source of innovation and relationship between actors will be different in each sector. The open innovation model has largely been studied and analyzed in technology-intensive industries, such as pharmaceuticals and information technology. Nevertheless, these technology-intensive industries are no more than a few of the numerous industries in an advanced industrial economy (Chesbrough, 2006). The present research aims to discover whether the concepts of open innovation could be applied to other industries, such as retailing. Taiwanese convenience store chains compete to introduce new products/services quickly. To this end, convenience store chains must integrate multiple sources of knowledge within their firms or outside the firms' boundaries to develop and launch new services speedily. Convenience store chains rely heavily on different IT systems to share relevant information between the actors, to analyze consumers' needs and provide useful

information to upstream suppliers who are trying to develop suitable goods/services. They basically cooperate with the IT system and logistics suppliers to develop the structure of each new service development. These suppliers often adopt new technology/IT systems in their functional development and provide professional services to convenience store chains in developing new services, leading to the greater efficiency of store operations.

2.6 Innovation in the service sector

Service could be seen as a series of activities which involve relationships between the service provider and its users. In most services, there appear to be high levels of interdependency and interaction between service providers and users, as well as between service providers and their suppliers (Tether and Metcalfe, 2004). Innovation in service sector involves significant changes in service (the service concept), production (the service process) or delivery (the service system). This concerns the introduction of new service and reconfiguration and improvement in the existing service (Miles, 1994). Previous research argued that innovation in the manufacturing and service sectors have some similarities in the development process, such as more formalized and structured programmes, high quality development staff and resources, aligned with their culture and system and sharing a strong commitment to innovation (Nijssen et al., 2006). Although the usual dimensions of innovation in the service sector originated from the manufacturing sector, previous research has argued that these cannot be fully applicable to a service context (Tidd and Bessant, 2009). Some different characteristics can be used to differentiate the innovation in services from that in products (Johne and Storey, 1998; Bernardt, 2000). These include the characteristics of intangibility, simultaneity, heterogeneity and perishability in the service context (Vermeulen, 2001; De Jong et al, 2003). Previous research argued that some of these specific characteristics influenced the new service development process. For instance, the intangibility of service is the most important factor; it makes the service development process more complex and demands intensive communication between people for understanding and creating a new service. And the simultaneity of service also affects the service development process by the close involvement and integration of front and back office personnel (Vermeulen and van der Aa, 2003). Therefore, service firms do not incur much R&D expenditure in their new service development processes.

This is because innovations in the service industry develop new concepts or processes on the basis of already existing business. Manufacturing firms often spend much on R&D, however, to develop new products.

Moreover, this thesis uses the objects of innovation, degree of novelty and dimension of newness to discuss the main differences between innovations in service and in manufacturing industry, on the lines of previous research (De Jong et al, 2003). First, comparing the object of innovation between the manufacturing and service industries, the object of innovation in the former can be of two kinds, process and product innovation. But it is difficult to adopt this distinction to clarify innovative activities in the service industries. Previous research also supports this argument that it is very difficult to distinguish process innovation from product innovation in the service sector (Gallouj and Weinstein, 1997; Hipp et al., 2000). The reason is that services commonly lack a physical form to measure and the service context is contributed by a series of activities in terms of its typical characteristics of intangibility and simultaneity. This means that a service can be innovated by changing the process of provision. In order to tackle this problem, Howells and Tether (2004) suggest that it is better to distinguish between inward and outward looking innovation activities. Inward looking innovation activities focus on the way in which a service firm carries out its activities for a certain purpose, such as reducing cost, whereas outward looking innovation activities reveal how a service firm interacts with others, such as customers, competitors and suppliers.

Second, the degree of novelty in service innovation ranges from totally new, discontinuous innovation to line extensions, just as that in product innovation does. The degree of novelty can be simply represented by both sides of a spectrum in innovation: radical innovation and incremental innovation. Some previous studies also use different degrees of novelty to categorize different types of service innovation. For example, Lovelock (1984) categorizes six major types of innovation: major innovation, start-up business, new for services for the market presently, service line extension, service improvement and style changes. Gallouj and Weinstein (1997) also divide service innovation into six types: radical innovation, improvement innovation, incremental innovation, ad hoc innovation, re-combinative innovation and formalization innovation. Moreover, De Jong et al, (2003) argue that radical innovations are usually developed in step with large-scale and formalized progress in manufacturing industry. This can be

managed by project managers and divided into different aspects of regular work to different departments. In contrast, incremental innovation is often developed with less formalized progress and less large-scale change. Innovation in a service industry often belongs to this type and is developed by different actors, such as clients and suppliers, who are involved in the development of a new service.

Third, the dimension of newness is often used to describe innovative newness within a developing firm, outside a developing firm or both. In terms of the characteristic of simultaneously, De Brentani (2001) concluded that service innovation is usually developed by an outside developing firm and within a developing firm working together, which is more often than not an innovation in manufacturing. Furthermore, previous research also used some of the characteristics of sectors (e.g. innovation form, innovation approach and technological orientation) to contrast the manufacturing and service sectors (Fasnacht, 2009); this contrast is shown in Table 2.5. According to the above discussion of differences between the manufacturing and service sectors, innovation in the service sector often combines external and internal resources for innovation purposes. Service innovation is usually preferred to be incremental and customer-led in character and technology and the market pull together in developing new technology.

Table 2.5: The difference between the manufacturing and service sectors

Sectoral characteristic	**Manufacturing sector**	**Service sector**
Product characteristics	Tangible, Easy to store, High distribution cost	Intangible, Easy to multiply and distribute
Technology orientation	Technology-push, Science and technology-led	Technology/market-pull, Consumer-led
Innovation approach	Mainly in-house resources (except for high-technology industry in certain clusters)	Combining external and internal resources
Innovation form	Attempting to be radical	Mainly incremental innovation

Source: Adapted from Fasnacht, D. (2009) *Open innovation in the financial services: Growing through openness, flexibility and customer integration*, p.45

Recently, some studies have adopted different dimensions to classify the diversity of service innovation, such as new operating/delivery processes, the newness of a service

to the market and also to the company, or service modifications in the financial service industry (Xin et al. 2006). Den Hertog and Bilderbeek (1999) propose a four-dimensional model in which the dimensions are the service concept, the client interface, the service delivery system /organization and the technological option to analyze the service innovation. The dimension of the service concept pertains to the more intangible characteristics of a new service, such as the idea or concept of a new or renewed service. This also includes the recombination of existing service processes and activities. Most services are markedly more intangible and invisible than manufacturing products. A service firm changes its service context in terms of the characteristics of existing and competing services. The dimension of the client interface covers the design of the interface between the service supplier and the client, such as the communication format and its channel. The service firm provides a new client interface, based on the characteristics of actual and potential clients. The dimension of the new service delivery system/organization refers to the internal arrangements which allow workers to perform their jobs accurately and develop the new service. In order to produce a service innovation, a service firm has to adjust its internal organizational arrangements, forms, capabilities of its personnel and their skills and training. The last dimension is the development and implementation of the new technology, which is related to developing a new service. These writers also argue that any service innovation consists of a combination of the above dimensions, because one dimension may be incorporated with the other dimensions for innovation purposes. For instance, starting a new service concept requires marketing knowledge and competence, while developing a new client-interface by using a service delivery system also requires knowledge and competence in order to distribute the service.

Moreover, Forfás (2006) emphasizes that a service innovation also has the features of being multidimensional, interactive and incremental. This research identifies different types of service innovation, such as: 1) new network or business models and value chain configurations; 2) delivery system innovations; 3) organizational innovations; 4) customer interface innovations; 5) technology and product based innovations which build on new technology, new knowledge, new delivery channels and combinations of existing knowledge, technology and concepts. The research finds that these combinations can be listed as: 1) combining existing service elements; 2) splitting up service elements; 3) developing service products – modularisation and branding of

services; 4) customer specific applications/tailor-made innovations; 5) close co-operation; 6) adding features to a service – incremental innovation; and 7) changes in delivery mode. Next, the research argues that the approach of traditional technological innovation is too narrow, because many kinds of characteristic, such as organizational innovations, the factors involved in a development process for innovation and the codified knowledge for innovation are used in both the service and manufacturing industries. Service innovation can also be simply divided into a technological dimension, which is related to the development of ICT, and a non-technological dimension, which is related to such things as new service concepts, new delivery systems and new customer interfaces. Accordingly, this research provide a three-dimensional typology of service innovation, which includes new business models/concepts, new customer/delivery interfaces and new service-product offerings in order to put different dimensions of service innovation into operation and structure the research findings. The first dimension - the new business models/concepts - is exemplified by, for instance, recombinations of services, switches from the manufacturing to a service model, outsourcing and internationalization of services and a focus on niche activities/content. The dimension of new customer/delivery interfaces is illustrated by has some examples such as the use of electronic forms of interface, such as service delivery mechanisms for tracking, delivery forms, management of service through customer accounts and the management of the customer relationship. The dimension of new service/product offerings is related to traditional manufacturing based innovation activity, such as a firm's being built around complementary technologies, which enable the firm to provide a new service. Each typology of service innovation can involve technological and non-technological dimensions.

Furthermore, this thesis also considers the source and purpose of innovation in the service sector. Tether (2002) argues that innovation in services has been discussed from three different perspectives: the traditional, interactive and strategic positions. The traditional (technology dependent) perspective emphasizes the use of externally developed technologies, in particular the adoption of hardware technologies, to contribute innovation. Most sources of innovation sources were developed by external actors, adopted principally from suppliers. The purpose of innovation focuses on reducing cost and extending service availability. The interactive perspective emphasizes interaction with users in order to satisfy the customers' needs. The firms often

collaborate; they co-develop with customers and involve their internal sources to provide innovation. The concept of the strategic position view originally comes from evolutionary theory and competence-based theory and sees competition and innovation as a process for gaining a strategic position. The innovation and strategic position can be achieved by innovative combinations of technologies, that is, software and hardware technologies. A firm usually develops new services internally and sometimes collaborates with suppliers, customers and competitors, depending on possible innovation trajectories to gain a strategic position within the sector. The purposes of innovation are widely varied and include cost reduction and market expansion. This perspective also takes into account that service providers strictly control their outputs and does not put much effort into establishing and maintaining the interactions or relationships with its customers.

With the above different perspectives on the sources and purposes of service innovation, innovation in the service sector can be seen to be triggered by different actors, the supplier, the service firm and the client. These actors play different roles in a typology of five types of service innovation (see Table 2.6). The different types of innovation are supplier-dominated innovations, innovations in services, client-led innovations, innovations through service and paradigmatic innovations. These different types of innovation can be determined by different sources of service innovation. Maffei et al. (2005 provide a similar innovation model which classifies service innovations by source into those from the suppliers, from the company itself, from customers and from competitors.

Table 2.6: Patterns of service innovation

Innovation pattern	**Role of supplier**	**Role of service firm**	**Role of client**
Supplier-dominated innovation	-Supplier domination (push) -Locus innovation activity	-Implementation of a new service product or organization	-User of innovative service product
Innovation in services	-Input for service product	-Locus of innovation activity -Implementation of a new service product or organization	-User of innovative service product

Client-led innovation	-Input for service product	-Locus of innovation activity -Implementation of a new service product or organization	-User domination (pull) -User of innovative service product
Innovation through services	-Input for service product	-Supplier domination (pull) -Locus innovation activity	-Locus of innovation activity -Implementation of a new service product or organization
Paradigmatic innovations	-Input for service product -Locus innovation activity	-Locus of innovation activity -Implementation of a new service product or organization	-Locus of innovation activity -User of innovative service product

Source: Adapted from den Hertog, P. and Bilderbeek, R. (1999) Conceptualising service innovation and service innovation patterns. *Research Programme on Innovation in Services (SIID) for the Ministry of Economic Affairs*, Directorate for General Technology Policy (Dialogic)

2.7 The concept and mechanism of organizational routine

Open innovation can be seen as a method to establish a relationship and to cooperate with complementary actors in order to acquire essential resources in order to create value. But the question of how to make valuable resources/knowledge flow into the internal development process and further share internal knowledge with partners is still unanswered. Previous studies argue that the development of an organizational routine for knowledge transfer is essential to help firms acquire and assimilate related knowledge with external actors and to combine and transform knowledge within the firm in order to create value (Vanhaverbeke et al., 2007). Moreover, Trott and Hartmann (2009) also argue that the problem of open innovation – making knowledge flow between different departments within a firm – may be reduced if the firm's internal boundaries are already tightened, even though a focal firm must open up the knowledge flow with external companies. Accordingly, it is interesting to explore how a focal firm develops an inter-organizational routine between firms to transfer knowledge on the one hand and, on the other, to design an organizational routine within its firm in order to confirm that knowledge is flowing to the appropriate departments, teams and individuals This section reviews the previous literature on the concept and perspectives

of organizational routine.

Since Nelson and Winter (1982) proposed the concept of organizational routine in the analysis of organizational and economic change, the idea has been widely adopted in many research papers. They defined the concept of routine in terms of “regular and predictable behavioural patterns” (Nelson and Winter, 1982, P.14) and described routine as a series of genes which can be generative structures or potentialities. Recently, Feldman and Rafaeli (2002) have defined organizational routine as: *recurring patterns of behaviour of multiple organizational members involved in performing organizational tasks*. The definition implies that organizational routine recurrently involves many people in multi-actions for the sake of performing organizational tasks. They also argue that organizational routine provides the opportunity to connect several persons in an organizational task. The connection between people allows them to transfer related information from one to another in order to accomplish the organizational tasks. Moreover, the concept of organizational routine has also been discussed from different perspectives. Becker (2004) illustrates that the concept of the organizational routine can be interpreted in three ways: 1) behavioural regularities; 2) rules, standard operating procedures; and 3) dispositions. The first interpretation of routines refers to behavioural regularities which illustrate the routine behaviour patterns for collectives (multi-person) and of habit for individuals (single persons) (Dosi et al., 2000).

The second interpretation refers to rules and operating procedures (Cohen, 1991; Egidi, 1996). Feldman and Pentland (2003) propose the ‘performative’ and ‘ostensive’ as two ways of constituting routine in order to overcome the omission of agency and contradictory data. The ostensive aspect of routine can be described as abstract patterns which participants adopt as guidance and principles. The performative part of routine can be described as specific actions carried out by specific people, at specific times and places. Their study also illustrates how the interaction between these two aspects helps to account for different degrees of change in different routines and the importance of agency. Pentland and Feldman (2005) argue that an organizational routine can serve as a unit of analysis and suggest that an organizational routine can be codified and illustrated by many forms of artefact, including written rules, procedures (these two related to the ostensive aspect of routine), work logs and database (the last two related to the performative aspect of routine). These artefacts are physical demonstrations of

organizational routine which constrain organizational routine and allow it to be practically endless. For example, formal rules and standard operating procedures can easily capture the concept of organizational routine with a company, which also involves participant and hardware to support the workflow and execution of tasks. Previous studies have tried to investigate the organizational routine as practiced within a firm and between firms. For instance, Jonsson and Elg (2006) investigate the routine for sharing knowledge within an international retail company which has a wide store-spread in different countries. The head office designed a formalized routine (e.g. weekly sales tours with the store manager) for this purpose at the store level. The inter-departmental knowledge sharing often took place at personal meetings and in documentation on the intranet. Moreover, Mante and Sydow (2007) illustrate that a focal firm used decentralized, cross-functional group meetings in the ostensive aspect of intra-organizational routine. Face-to-face and telephone conferences were adopted by cross-functional project members and small peer-to-peer group discussion complied with the performative aspect of intra-organizational routine. This research was based on two specific practices: the practice of making decisions and managing projects in a project of an international joint venture. Recently, Hale and Tidd (2009) have used empirical analysis, which narrowed down formal routines and formal representations rather than exploring the broader aspects of routines. Their research focuses on the issue of performance, examples of work practice, the specifics of representational work and the interaction between management and the production of knowledge. The process of decision making was observed at the conceptual design level; it adopted two data-focusing lenses, a representational artefact and an organizational work setting. They find that work is often done by formal representation but formal representation is often done by formal routine, such as formally routinized processes of document processing and task-sequencing. The organizational work setting was a cross-function series of team meetings which included a kick-off meeting, project review meeting and sign-off process in order to beta release and formal task and story telling. Moreover, they also found that explicit formal representational artifacts were applied to non-formal representational work, such as storytelling, which made the distinction between the prior representations of action and the representations of concurrent, completed work in other times and places.

Third, some previous studies have argued that routine can be described as a matter of

disposition rather than behaviour (Hodgson, 2003; Hodgson and Knudsen, 2003, 2004). Hodgson (2003:376) also proposes the view that “routines are stored capacities or capabilities. These capacities involve knowledge and memory. They involve organizational structures and individual habits which, when triggered, lead to sequential behaviour”. The importance of this perspective for business practice is that routines are repositories which store informal, tacit knowledge and individual skills. Routine usually serves as the means through the group by which individual skills are triggered. This also involves procedural memory, which is triggered by preceding events and stimuli. Procedural memory leads to behavioural responses and is triggered by cues provided by others. The above three interpretations of organizational routine (behavioural regularities; rules and standard operating procedures; and dispositions) all refer to regularities (Becker, 2004).

Moreover, Becker (2004) reviewed the literature on organizational routine and summarizes eight characteristics of routine from previous studies. These are: 1) *patterns* (Nelson and Winter, 1982; Cohen et al., 1996), 2) *recurrence* (Pentland and Reuter, 1994; Cohen et al., 1996), 3) *collective nature* (Nelson and Winter,1982; Grant, 1991; Hodgson and Knudsen, 2003), 4) *mindlessness* (Ashforth and Fried, 1988; Nelson, 1995; Dosi et al., 2000) *vs. effortful accomplishment* (Pentland and Reuter, 1994; Feldman, 2000; Feldman and Pentland, 2003), 5) *the processual nature of routines* (Pentland and Rueter, 1994), 6) *context-dependence* (Teece and Pisano, 1994; Cohen et al., 1996; Teece et al., 1997), *embeddedness* (Reynaud, 1998) *and specificity (*Reynaud, 1998; Hodgson, 2001; Dyer and Singh, 1998*),* 7) *path dependence* (David, 1997) and 8) *triggers* (Cohen, 1991; Nelson and Winter, 2002).

Previous research mainly focused on organizational routine within a firm due to the fact that organizational routine has no clear boundary; the concept of organizational routine is still being developed at the inter-organizational level. Regarding the relationship between different levels of routine, Dyer and Hatch (2006) argue that internal routines may be determined by inter-organizational routines which constitute the network context linking the systems of a focal firm to the systems of its suppliers and customers. Zollo, Reuer and Singh (2002) identify the concept of inter-organizational routines as stable patterns of interactions among firms, developed and refined in the course of repeated collaborations. Moreover, Pentland (2004) proposes that inter-organizational

routine is a type of organizational routine in which individuals from different organizations are involved. Some studies have investigated organizational routine st the inter-organizational level in order to understand how a focal firm uses different inter-organizational routines with external firms to execute different tasks (Dyer and Nobeoka, 2000; Mante and Sydow, 2007; Capaldo, 2008). For example, Dyer and Nobeoka (2000) find some evidence that Toyota used inter-organizational routines with its suppliers, such as regular meetings of the supplier's association and regular visits by consultant teams to the partners' sites, in order to help knowledge to be shared between firms. Furthermore, Mante and Sydow (2007) studied a project by an international alliance based on R&D practices and identified different practices in the areas of making decisions and managing projects. This research also divided different spheres of routine, including intra-organizational routine and inter-organizational routine in the aspects of: ostensive and performative. Taking decision making practice as an example, firms used regular meetings at different hierarchical levels, prenegotiations and side meetings, etc. as part of the ostensive aspect of inter-organizational routine. Firms similarly used different types of mechanism for knowledge transfers, such as face-to-face and telephone communications in the performative aspect of inter-organizational routine. Capaldo (2008) also found that firms should develop high levels of interaction with one another to increase the density of the network and develop trust-based links between firms. This research shows that inter-organizational routine can encourage knowledge sharing and co-development between firms.

2.8 Summary

Overall, the literature on the concept of open innovation speaks of the importance for value creation of inter-firm relations for acquiring essential resources from external actors. This concept is similar to the existing innovation literature which focuses on establishing relationships with different actors for the purposes of innovation. When a firm establishes an inter-firm relationship with partners to create value, problems and risks may arise which threaten the innovation outcome. The present research argues that it is important to develop and adopt control mechanisms in the innovation process to reduce relational risks between firms. In addition, innovation can be seen as a process which, according to the sectoral system of innovation, involves interactions and cooperation between different actors. The different roles which these actors play in the

sectoral system of innovation may ease the generation and exchange of knowledge relevant to the new service development. Thus, in developing a new service, a focal firm may engage in different types of relationship with external actors. The present research investigates how a focal firm adopts formal and informal relationships/ interactions with partners to create and introduce a new service speedily and, further, minimizes the risk of knowledge leakage in this process. However, the types of inter-organizational ties may also indicate the degree of control wielded by external actors over the speed of knowledge acquisition and assimilation in this context. This raises an important issue: exploring the connection between the inter-firm relationship and the outcome of the new service development.

Moreover, the present research argues that in the process of open innovation it is important to developing an organizational routine for knowledge transfer within a focal firm and between firms. This is because organizational routines can be seen as the architecture within which individuals acquire, assimilate and further exploit the related knowledge between partner firms and within a firm, tacit knowledge in particular. A firm which innovating should develop a routine for keeping knowledge flowing between departments or individuals, leads to knowledge flow to the appropriate groups or individuals. Efficient routines with partner firms can help them acquire related knowledge/resources from partner firms and fill the internal knowledge base with it in order to create value. The effect of intra-and inter-organizational routines for transferring knowledge on the outcome of new service developments needs to be further discussed.

Chapter 3: Theoretical framework

3.1 Introduction

As argued in Chapter 2, adopting open innovation can reduce development cost and time, by using external knowledge/resources to tap into a focal firm's innovation process. However, the question of how a firm develops and manages inter-firm relationships in an open innovation approach and how this issue is associated with the outcome of new service development needs to be explored. Previous studies criticizing the concept of open innovation find convincing evidence in practice which suggests that inter-firm collaboration in innovation often involves different degrees of openness (Dalander and Gann, 2007; Trott and Hartmann, 2009). It cannot be seen as a simple dichotomy between an open and a closed business model in inter-firm collaboration. Moreover, some studies also argue the leakage of valuable, sensitive knowledge may be occurred when a firm adopting open business model in inter-firm collaboration (Trott and Hartmann, 2009; Lazzarotti and Manzini, 2009). According to the literature, the potential risks may occur in inter-firm collaboration including the risk of dependence ("hold-up" risk) and risk of knowledge loss (spillover risk). The risk of hold-up arises from switching cost from the current partner firm to some other firm because a firm investing specific assets in a transaction with a partner causes dependence. The risk of spillover comes from the mutual information sharing between collaborative firms in order to understand and use their complementary competence (Nooteboom, 2004). Recently, some studies have begun to investigate this problem of open innovation by using different modes of inter-firm relationship or governance to manage inter-firm collaboration when a firm cooperates with external companies for value creation (von Zedtwitz and Gassmann, 2002; van de Vrande et al., 2006; Birkinshaw, 2007).

Moreover, the influence of inter-firm relationships on innovation outcome also needs to be further investigated in terms of different types and degrees of inter-organizational ties and control between cooperating firms. Furthermore, open innovation can be seen as a strategy to establish different external relations with complementary actors in the innovation process for acquiring essential resources/knowledge. But it is nowadays an important question how valuable resource/knowledge can be made to flow into the internal development process or how to share internal knowledge with partners because valuable knowledge cannot be automatically distributed between cooperating firms

(Vanhaverbeke et al., 2007). Appropriate routines can help to share related information/knowledge among appropriate groups and individuals. Accordingly, the issues of how and what organizational routines a focal firm develops for transferring knowledge between firms and internally and what influence this has on innovation outcomes need to be investigated.

This present chapter reviews literature, including inter-firm relationships, organizational routine and the outcomes of new service development in order to establish the conceptual framework and investigate how firms use different inter-firm relationships and organizational routine in the process of different service developments and how these are associated with innovation outcome in the Taiwanese convenience store industry.

According to previous studies, innovative knowledge which spans firm boundaries is often embedded in inter-firm relationships (Dyer and Singh, 1998). In order to share, transform and integrate relevant knowledge for innovation purposes, firms need to adopt and manage different types and degrees of organizational form and governance mode in inter-organizational collaboration. Basically, the form of collaboration between firms includes subcontracting, licensing, strategic alliance and joint ventures, which involve different degrees of inter-firm collaboration. Moreover, previous research also argues that a firm should use different control mechanisms to minimize the potential risks in inter-firm collaboration (Dyer, 1997; von Zedtwitz and Gassmann, 2002; van de Vrande et al., 2006). The adoption of a particular form of collaboration between firms has been discussed from different perspectives, such as transaction cost theory, the relational view and resource-dependence theory. Transaction cost theory mainly focuses on the governance structure of the transaction between firms in order to reduce opportunistic behaviour. A focal firm should lock in the specific investment and keep the relationship as a long-term one when a specific investment is held by a partner firm. The choice of transaction governance structure is influenced by the degree of asset specificity (Williamson, 1985). Based on the contract control between firms, this perspective offers useful instruments for governance, including integration under hierarchical structure, hostage and ownership of specific investments in order to reduce the possibility of opportunism from one side. In addition, resource-dependence theory provides an insight into the relations between resource provision and control within

alliances. The degree of dependence is determined by the amount of valuable resource required and the number of alternatives (Pfeffer and Salancik, 1978).

Previous research argues firms can adopt formal and informal (relational) governance to minimize relational risks in inter-firm collaboration (Smith *et al*., 1995; Dekker, 2004; Scarbrough and Amaeshi, 2009). Formal governance consists of contractual obligations and organizational features, such as legal contracts, structural design and share ownership. Informal governance involves the social control, trust or social ties created by repeated interaction between firms. Many scholars propose that when formal governance mechanisms are unreliable, alliance partners may rely on relational-based mechanisms (e.g., Dyer and Singh, 1998; Dekker, 2004). The relation between formal and informal governance (complementary or substitute) is, however, still under debate. But, to deal with future relational uncertainties, relational-based governance would allow the flexibility which partners need (Poppo and Zenger, 2002).

Building on the above illustration from previous studies about adopting and managing inter-firm collaboration, section 3.2 identifies three main factors (intensity of inter-firm collaboration, interdependence and trust) to understand how firms adopt different types and levels of intensity in inter-firm relationships with external firms and manage inter-firm collaboration in the process of new service development. The question of how inter-firm relationships influence the performance of new service development will be addressed here from the perspectives of intensity of inter-firm collaboration, interdependence and trust.

Second, section 3.3 reviews the performance measurement of new service development and identifies specific measurements to address the outcome of new service development. The final section (section 3.4) further explores the literature by discussing the influence of organizational routine on the outcome of new service development in order to ask how firms adopt routines to acquire related knowledge and resources from external firms and assimilate and exploit these within its firm.

3.2 Inter-firm relationships

Inter-firm relationships are a very important issue when knowledge for innovation

purposes spans firm boundaries and has to be shared, transformed and integrated. This is because firms use different degrees and types of governance and organizational form in inter-organizational collaboration in order to share related knowledge with partner firms on the one hand and prevent the leakage of valuable knowledge on the other. Kanter (1994) also suggests that the ability to create and maintain rich collaboration with external firms could offer competitive advantages and help minimize the risks associated with new product development. As stated in section 3.1, a firm adopts different types and intensities of inter-firm collaboration (e.g. contracting, licensing, strategic alliance and joint venture) with external firms for innovation purposes. Moreover, a focal firm also uses different control modes (formal and informal) with external companies in order to reduce the relational risks in inter-firm collaboration. For example, Nooteboom (2004) provides some instruments/forms of governance to control relational risk in firms' collaboration; these are 1) evasion: do not include sensitive knowledge and specific investment in firms' collaboration; 2) integration: use integrated administrative control; 3) obligational contracting contracts; 4) relational contracting with the incentive of self-interest (e.g. mutual dependence, ownership of specific assets and knowledge, hostage and reputation); 5) relational contracting with loyalty (e.g. norms of conduct, routinization); 6) network structure; 7) using a go-between (e.g. relevant problems solving, monitoring and trust building). According to transaction cost theory, interdependence and trust are essential components of the success of inter-firm relationships because they mitigate the risks in inter-firm collaboration. Deep interdependence without trust in inter-firm relationships may increase the risk of opportunistic behaviour and the cost of cooperation because of the difficulty of managing and monitoring partners' behaviour. Developing mutual trust between firms can reduce the anxiety over opportunistic behaviour and increase the predictability of partners' behaviour, which in turn lowers transaction costs.

Taiwanese convenience store chains often collaborate with external firms to develop new services or products. They have different, long-term relationships with some important partners on the basis of switching cost, valuable resources, previous collaborative experiences and inter-personal trust. The present research examines three factors: intensity of inter-firm collaboration, interdependence and trust, in order to understand how a focal firm uses and manages different inter-firm relationships with external firms to share valuable knowledge and minimize relational risks in the process

of new service development and what influence this has on the speed of new service development.

3.2.1 Intensity of inter-firm collaboration

Previous research argued that the process of supplier integration was a black-box which needed to be further investigated (Petersen *et al.*, 2003; 2005). According to Fliess and Becker's research (2006), several possible types of cooperation design can be distinguished according to the different type and intensity of the contractual relationship (as shown in Fig.3.1). The intensity of cooperation between firms ranges from internal development, know-how exchange, which have a lower intensity of cooperation, to coordinated development, joint development and contractual joint ventures, which have a higher intensity of cooperation. Nylen (2007) also argues that "intensity" is another aspect that can be examined to understand the degree of interaction among partners. The present research mainly focuses on three forms of cooperation: contract development, coordinated development and joint development, in order to provide better insights into the black box of supplier integration in a new service development. These three forms of inter-firm collaboration can be used to distinguish the development responsibilities between supplier and consumer.

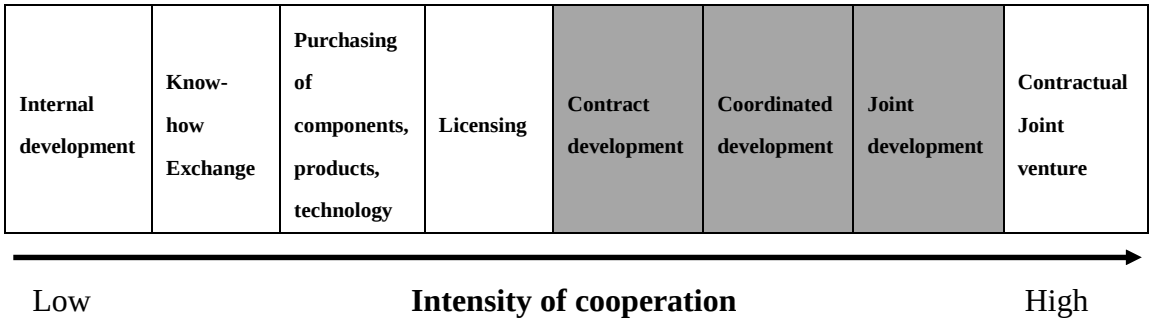

Figure 3.1: Cooperation design in new product development
Source: Adapted from Fliess, S. and Becker, U (2006) Supplier integration-Controlling of co-development processes. *Industrial Marketing Management*, Vol 35, p32

Contract development is based on the contract with suppliers who provide separated components/services of new service/product developments to customers. It is difficult for the customer to influence the development process, because the customer is involved only in coordination meetings. The form of inter-firm collaboration is used when the customer does not have enough resources/knowledge to develop new services/products.

Coordinated development is defined as the kind in which suppliers focus on the separate components/services of new service/product developments and some tasks are developed by the customer. There are three type of coordinated development: asymmetrical cooperation, black box cooperation and systems partnership (Gerpott, 1999; Tani and Wangenheim, 1998). Asymmetrical cooperation can be defined as the kind in which detailed instruction is provided by customer to supplier. Black-box cooperation means that a single module is developed by the supplier for the final product. System partnership means that the supplier develops a complex module of the final product and integrated pre-suppliers. This classification of coordinated development implies that customers and suppliers have different levels of responsibility in new product development. However, the present research argues that the above classification of coordinated development is somewhat ambiguous, because the specification of the decision-making process in a new service development has not been taken into account. Petersen et al. (2005) suggest that different levels of supplier integration are: 1) White-box cooperation, 2) Gray-box cooperation and 3) Black-box cooperation. White-box cooperation means that the buying company makes all the design and specification decisions but informally discusses the specifications with the supplier. Gray-box cooperation means that the buyer and supplier share related information and technology and joint decision making about specifications. Finally, black-box cooperation means that the buyer informs the supplier of his requirements and then gives the latter almost total responsibility to develop the project requirements. The buyer only reviews the specifications of the purchased items. According to the definition of different levels of supplier integration between supplier and customer, the present research provides clear distinctions in the coordinated development on the basis of different levels of responsibility for specification design between the firms which are associated with the decision making process (as shown in Fig.3.2). The coordinated development can be separated into five types: asymmetrical cooperation, white-box cooperation, grey-box cooperation, black-box cooperation and systems partnership. The definition of each type will be further described in Chapter 6 and adopted to identify the intensity of inter-firm collaboration between convenience store chains and their suppliers.

Compared with contract development and coordinated development, joint development is based on regular cooperation, in which teams are formed by the supplier’s staff and

the customer's staff. These teams can work in the same place or cooperate by using a high level of information exchange and regular coordinated meetings to integrate supplier and customer from different places. The form of development could be adopted in a new service/product development if the development project cannot be divided into different modules and assigned to customer or supplier. Moreover, Fliess and Becker's research (2006) also identifies trust, constant communication and achieving clear, reliable decisions between the partners as the most important factors in the success of the co-development process.

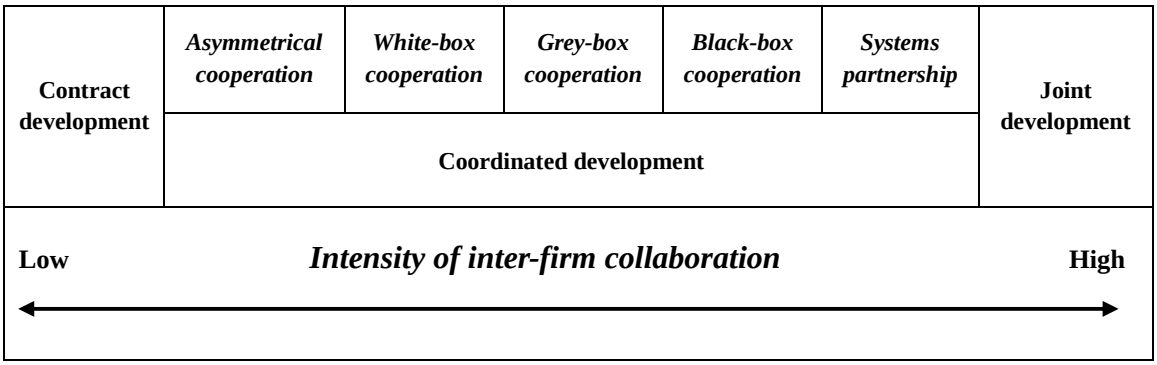

Figure 3.2: Different intensity of inter-firm collaboration
Source: Classification integrated from Fliess and Becker (2006) and Petersen *et al*. (2005)

3.2.2 The relationship between the intensity of inter-firm collaboration and the speed of NSD

Considering the relationship between the intensity of inter-firm collaboration and the outcome of new service/product development, Zahra and Nielsen (2002) argue that high levels of supplier integration can increase the interaction between firms in the innovative process, encourage joint decision making and problem solving in development process and lead to successful commercialization. Fliess and Becker (2006) suggest that the paralleling development procedure leads to the reduction of the development time. For instance, firms can carry out a joint investigation to identify and discuss the results and possible improvements of product or process, thus saving development time. They also put forward the view that scheduled timetables, development cost and development resources affect the development time. Cousins and Lawson (2007) argue that high levels of supplier integration can improve market share and time to market because of high levels of coordination between firms which share capital investment, development risk and reward and increase the integration of business

processes between firms. However, some previous studies argue that intensive supplier involvement in product development can increase development cost and time (Littler et al., 1995; Littler et al., 1998; Von Corswant and Tunälv, 2002). For example, Littler et al. (1995) conclude from their empirical study that closer collaboration with a supplier may increase the complexity of project management, and be time-consuming and difficult to manage and control.

Nylen (2007) suggests that the impact of the intensity of collaboration on effectiveness depends on the characteristics of the task (complicated vs. simple). When the development task is simple and sequential, a lower intensity of collaboration is sufficient. The more complex tasks must use intensive collaboration between firms to carry out. Nylen's study (2007) also shows that a higher degree of intensity is related to a higher level of outcome potential because of the close interactions between professionals. Based on the above argument, task complexity influences the relationship between the intensity of inter-firm collaboration and the speed of new service development. Emmanuelides (1993) proposes that a project with a high level of technological complexity needs a great deal of information to be processed between functions and can required increased time. Previous studies also have similar arguments that greater project complexity increases development time (Meyer and Utterback, 1995; Griffin, 1997). This is because a complex task has many steps to complete and requires a great many connections between the different functions. The carrying out of a complex task requires the use and integration of different information, thus, increasing development time. Given the above, the present study proposes that when a task is more complex, the intensive interaction between different functional staff may increase the time required for task development.

Moreover, Eisenhardt and Tabrizi (1995) argue that effective supplier integration can reduce the development time under conditions of a mature product line and well-designed development goals. Otherwise, the integrating the supplier protracts the time needed for product development. This implies that a project's newness may influence the speed of new product development. Moenaert et al. (1995) argue that a high degree of newness makes it difficult to reduce technological uncertainty and may lead to inefficient project development. This is because the project team must consider more design alternatives, new development processes and the new technology required

for undertaking a new project. Ragatz et al. (2002) propose that a high degree of technological uncertainty could hamper the outcome of product development as measured by cycle time, cost and quality. Their research finds that technological uncertainty has negative direct effect on the development cost, but no direct effect on quality and cycle time. The development time can be kept short through better integrative strategy and team process with suppliers in condition of technological uncertainty. Previous studies suggest that the impact of technological uncertainty can be mitigated by using information and cost sharing with suppliers (Auster, 1992; Hagedoorn and Narula, 1996). The risk of technological uncertainty can be reduced by early supplier involvement which has good capability, thus improving development performance (Wasti and Liker, 1999). Nevertheless, Petersen et al. (2003) suggest that a focal firm may integrate suppliers depending on the degree of technological uncertainty. They argue that supplier involvement seems to bring more benefits in the development process when technology becomes more mature. Building on previous studies, the present research postulates that the relationship between supplier integration and development outcome may vary with different degrees of project newness.

Existing evidence of the impact of intensity of inter-firm collaboration on new service developments is inconclusive. Some studies suggest that a high degree of intensity of inter-firm collaboration has a positive relationship with the speed of new product development (Zahra and Nielsen, 2002; Fliess and Becker, 2006). A high degree of intensity of inter-firm collaboration can reduce the time needed for decisions to be taken and development problems to be identified. In contrast, some previous studies argue that there is no positive relationship between the intensity of inter-firm collaboration and the speed of new product development (Littler *et al*., 1998; Von Corswant and Tunälv, 2002). The present research proposes that actually there is a positive relationship between the intensity of inter-firm collaboration and the speed of new service development. The relevance of task complexity and project newness in this relationship should be further investigated.

3.2.3 Interdependence

Dependence is a very important condition for creating and utilizing complementary competencies in learning and innovation. It also makes it easier for a successful inter-firm relationship to fulfill its agreement. Sako and Helper (1998) argue that

perceived interdependence between firms is the important factor for helping trust to be built and maintained, in terms of transaction cost theory. Investing specific assets in a partner firm can increase the creditability of the inter-firm relationship although switching cost may also increase it. Moreover, Prescott (1998) identified various reasons that explain why a firm becomes dependent on other firms. These include developing new product for the market, responding to consumer demand and making changes in a firm's strategy. When a firm demands the completion of a task which can be divided into two or more groups to contribute, interdependence is generated between groups or firms.

There are three academic perspectives from to identify the resource of interdependence: transaction cost theory, resource dependence theory and resource based theory. Transaction cost theory focuses on explaining how transaction cost can be reduced and economic efficiency enhanced in the transaction between firms. Williamson (1975) discusses five factors: opportunism, bounded rationality, small numbers, uncertainty and complexity and information impactedness which may incur transaction cost in market exchanges between firms and which contribute to market failure. In his latter research (1985), he further argues that the degree of asset specificity plays an important part in choosing an appropriate governance structure. This is because high degree of asset specificity may result in an asymmetrical relationship between firms and further lead to a high degree of dependency and opportunistic behaviour. It also decreases the number of alternative suppliers and further results in low bargaining power. If the transaction between firms is on the basis of a one-off and nonspecific asset, it is suitable to use a short-term, market-based transaction. A "hierarchy" transaction can be used within organizations, such as vertical integration and goal alignment with incentive rewarding if the transaction is based on a recurrent, high degree of uncertain outcome and the specific investment required. A focal firm vertically integrates with external firms which can be seen a safeguard against opportunistic behaviour, facilitates investment in specific assets, shortens the time required and controls product quality (Williamson, 1975; Harrigan, 1984). Takeishi (2001) also proposes that a buyer having part ownership of its supplier firm can have a high degree of performance outcome, because the buyer has financial control over his supplier and can control the supplier's behaviour and component quality. Some disadvantages of vertical integration have been identified in previous studies, such as lower degree of strategic flexibility and higher degree of

managerial cost (Harrigan, 1984).

Based on the resource dependence view, the inter-organizational relationship can be seen as a set of power relations in terms of valuable resource exchanging. Resource scarcity encourages a firm to engage in inter-organizational relationships to acquire the needed resources from external firms. A focal firm also has to use different governance mechanisms with external firms to manage resource dependence and reduce uncertainty (Pfeffer and Salancik, 1978). Firms have to reduce their resource dependence on other firms and increase other firms' resource dependence on themselves. In order to achieve this, a focal firm can develop specific, complex knowledge, resources and skills to enlarge its capacity and competence and enhance competitive advantage, according to resource-based theory. Woolthuis et al. (2005) suggest that dependence can be measured by assessing switching cost (asset specificity), the number of alternative firms, valuable resources and company size. Building on past literature, the present research identifies the main sources of inter-firm dependence: unique, valuable resources (Das and Teng, 2000; Gulati et al., 2000) and switching cost (Williamson, 1979, 1985; Whitten and Wakefield, 2006; Kim et al., 2010). Switching cost denotes a small number of alternatives and transaction-specific investments made between firms. However, dependence may result in the problem of 'hold-up', which is one kind of relation risk. Hold-up risk increases in particular from switching costs from the present partner firm to a new partner because of existing transaction-specific investment. Managers can use ways to control "hold-up" risk such as long-term contracts, share ownership of specific investments and resources and hostages to achieve stability of dependence (Nooteboom, 1999).

3.2.4 The relationship between interdependence and the speed of NSD

Considering the relationship between interdependence and the outcome of new product/service development, most previous studies have focused on the way in which dependence between firms influences the quality outcomes (Haile´n et al., 1991; Takeishi, 2001). For example, Pfeffer and Salancik (1978) argue that a buyer firm has the power to ask the supplier to make more effort on component development if the supplier's sales greatly rely on this buyer. Some previous studies also argue similarly that a supplier is willing to improve his production process and specification in order to meet the buyer's requirements when supplier greatly depends on the buyer for sales

volume (Haile´n et al., 1991; Carr et al., 2008). Takeishi (2001) also proposes that a supplier whose sales greatly depend on a buyer can achieve a high degree of performance outcome (design quality). The research finding shows that a supplier puts more effort into component development when his sales depend greatly on important customers. In sum, a supplier may make more effort to provide resources in order to fit a buyer's requirements if he greatly depends on this buyer for his sales. The greatly dependent relationship between supplier and customer has a positive influence on the buyer's outcome.

Moreover, the interdependence between buyer-supplier firms influences the decision-making process of buyer firms. Gao *et al*. (2005) suggest that a supplier's dependence on his buyer firm reduces the uncertainty in the buyer's decision-making process. If a supplier is greatly dependent on his buyer, he may be more willing to devote more resources to the transaction. Equally, the buyer may have more confidence in the transaction due to the reduction of uncertainty involved in his purchasing decision-making. Accordingly, it may increase the dependency of the buyer on one important supplier and thus create mutual dependence between firms. The mutual dependence between buyer-supplier firms can reduce the degree of uncertainty in the transaction outcomes. Additionally, in mutually dependent relationships, partner firms are expected to refrain from opportunistic behaviour, which in turn tends to strengthen motivation to cooperate and increase cohesion and affective commitment. Cooperative firms are also encouraged to share related knowledge/resources and to understand each other's goals, rules, routines and contributions in transactions (Lusch and Brown, 1996). According to resource-based theory, partner firms contributing dissimilar and non-redundant resources to their partnerships tend to achieve better alliance performance (Olk, 1997). Similarly, previous studies suggest that complementary alignment has a positive influence on alliance performance because partner firms bring unique, valuable resources to strengthen the alliance (Hill and Hellriegel, 1994; Das and Teng, 2000). As a result of the above discussion, the present research proposes that mutual dependence tends to have a positive influence on the speed of new service development.

3.2.5 Trust

It is commonly recognized that cooperation between companies to achieve innovation requires trust. This is because uncertainty is difficult to completely manage by contractual control during the innovation processes. Poppo and Zenger (2002) find that the level of contract complexity increases in association with increased relational governance (trust). They argue that relational-based governance would allow the flexibility which partners need for dealing with future relational uncertainties. Moreover, trust can ease the communication between cooperative firms and encourage information and knowledge sharing (Clark and Fujimoto, 1991; Nishiguchi, 1994). This in turn may help to mitigate bounded rationality problems. In addition, mutual trust may motivate cooperative firms to invest in specific assets and to refrain from opportunism and goal conflicts (Sako, 1991; Dyer, 1996). Moreover, Seppänen et al. (2007) also argue that trust is seen to increase adoptability, predictability and strategic flexibility. It also helps reduce transaction cost and internalization cost (amount spent on knowledge/resource acquisition). Previously, trust has been discussed from different theoretical approaches such as psychology, transaction cost economics and socio-psychology. Sako and Helper (1998: 388) combine economic, sociological and psychological theories and define trust as: *"An expectation held by an agent that its trading partner will behave in a mutually acceptable manner and will act fairly when the possibility for opportunism is present"*. This definition implies that the uncertainty and the possibility of opportunistic behaviour of a partner firm always exists in inter-firm relationships. Trust can reduce the uncertainty over of a partner's opportunistic actions as well as their possibility. Some studies argue that transaction costs can be minimized when the possibilities of goal conflict and opportunistic behaviour between firms are reduced and mutual trust is developed (Gulati, 1995). The increase of predictability in a partner's behaviour also leads to lower transaction costs (Zaheer et al., 1998). Trust is normally developed through the processes of calculation, prediction, intentionality, capability and transference (Doney and Cannon, 1997). The calculative process means that trust building is on the basis of calculating cost and the rewarding of a partner firm in a cooperative relationship. The prediction process means that a focal firm has the ability to forecast its partner firm's behaviour. The intentionality process means that trust can be established through the interpretation and assessment of a partner's motivation. The capability process can be described as a situation where a focal firm's partner has the capacity to achieve its goals and to follow its rules. Finally, the transference process

means that trust can be transferred from one firm to another firm through a third party's definition of what is trustworthy. These processes can be used to identify the trust-building process between firms.

According to previous studies, trust is often conceptualized as a multi-dimensional construct. In the research on inter-firm relationships, the dimensions of trust examined include credibility, benevolence, reliability, honesty, integrity, ability, dependability, responsibility, faith, judgment, goodwill, contract trust, competence trust, reciprocity, fairness, predictability and frankness… etc. (Smith and Barclay, 1997; Sako and Helper, 1998; Dyer and Chu, 2000; Seppänen et al., 2007). The most commonly used dimensions are reliability, credibility/competence and benevolence. Reliability is a belief that partner firms will consistently deliver in terms of promises made. Benevolence is a belief that the other partner firm will treat the risking partner well under new conditions. Competence is the belief that partner firms have the ability to perform what they promise. Although there is many dimensions of trust that can be used to measure the concept of trust, some of the dimensions are blurred and overlapping, which makes trust difficult to assess. For example, the definition of dependability resembles those of goodwill and benevolence (the overlap problem). The meaning of credibility is similar to that of competence trust. In order to solve this problem, Sako (1992) creates a typology of trust involving: 1) contractual trust (partner firm will accomplish its written or oral agreement by a universalistic, mutual agreement); 2) competence trust (partner firm has the ability to fulfill its agreement); and 3) goodwill trust (the most abstract form which focuses on whether a partner firm has the intention to honour its agreement). This classification can be useful in identifying the characteristics of relationships between firms. Furthermore, Laaksonen et al (2008) summarize that some conditions conducive to different types of trust emergence can be used to assess firms' trust. For example, the conditions of reliance on oral agreements and avoiding contracting costs can be seen as the emergence of contractual trust. The conditions of good capability and reputation, repeated interaction between firms and transaction-specific investments and commitment can be seen as the emergence of competence trust. The emergence of goodwill trust comes from the conditions of risk and profit sharing, valuable knowledge sharing and a long-term cooperative relationship between firms.

Recently, some studies have aimed to distinguish the concept of trust at different levels: inter-organizational trust and interpersonal trust, and find that a close relationship between them is implied (Larson, 1992; Aulakh et al., 1996: Zaheer *et al*., 1998; Howorth et al., 2004). Zaheer et al (1998) define both that inter-organizational trust is "*the trust placed in the partner organization by the members of a focal organization*" and interpersonal trust is "*the trust placed by the individual boundary spanner in her individual opposite member*". They argue that interpersonal trust is the important factor constituting inter-organizational trust. Some studies also find similarly that the constitution of inter-organizational trust tends to be closely connected to trust built between individuals in cooperative organizations, whatever the inter-organizational trust in the context of small firms or large firms (Larson, 1992; Dyer and Chu, 2000; Howorth et al., 2004). According to previous research, interpersonal trust can be conceptualized in different dimensions, such as creditability and benevolence (Ganesan, 1994). For instance, creditability can be evaluated according to how far a peer can accomplish his spoken promises or written statements. Previous studies argued that interpersonal trust can increase "organizational citizenship behaviour", such as a peer offering assistance to other peers which are outside his work role and which facilitates organizational operations. Interpersonal trust also increases "interpersonal citizenship behaviour", such as providing assistance to other peers to achieve their objectives and tasks (McAllister, 1995). The trust built between peers also tends to be associated with reduced difficulty of negotiation between them, because peers are willing to share valuable information and believe that the shared information is not misrepresented (Currall and Judge, 1995). The lower degree of trust between peers may provoke defensive behaviour to protect their knowledge/resources. Further, when a high level of trust exists between peers, organizations focus on developing solutions to solve the problems they meet rather than raising doubts about personalities (Fisher and Ury, 1991).

3.2.6 The relationship between trust and the speed of NSD

According to previous research into the relationship between inter-firm trust and economic outcomes, inter-firm trust has a positive influence on lower transaction cost (Dyer and Chu, 2003) and increased return on investment (Luo, 2002). Previous studies examining the relationship between trust and project success find that a high level of trust between firms leads to effective conflict resolution and enhanced cooperation

between firms (Morgan and Hunt, 1994; Hagen and Choe, 1998). When a high degree of trust exists between firms, they are more likely to tolerate conflicts and to respect differences, thus enhancing the possibility of reaching compromise and consensus and strengthening cooperation. According to previous studies, trust between firms is closely associated with lowered negotiation cost and conflict cost in inter-firm collaboration, thus there is no support for the view that trust between individuals lowers the costs of negotiation and conflict (Zaheer *et al*., 1998). Moreover, some studies also argue that the greater level of trust between firms, the more willing organizations will be to share and exchange information (Mayer, Davis and Schoorman, 1996; Chiles and McMackin, 1996). Developing mutual trust helps control the time and effort needed to check up on partner firms and this further reinforces inter-firm relationships (Child *et al*., 2005). According to previous studies, a high level of trust between cooperative firms has a positive relationship with time efficiency in the process of product development (Bonaccorsi and Lipparini, 1994; Bstieler, 2006). Moreover, Dayan et al. (2009) find that in highly turbulent environments, managerial trust is critical for project success, such as accelerating the speed to market. Their finding is in line with previous innovation literature, which suggests that team members have to be more intensively cooperative in highly turbulent and complex environments in order to reduce the time taken for decision-making. Often team members have to experience higher cognitive loads and spend time on discussion and negotiation in order to make accurate decisions. Thus it is important that team members must collectively hold a belief that the team can be effective in accomplishing its goals and tasks. Akgün et al. (2007) find that team potency can be positively influenced by trust among the project team members, team empowerment and the past experiences of the members. Their research also finds that team potency positively influences speed-to-market and the market success of new projects. Moreover, Massey and Kyriazis (2007) find that interpersonal trust between managers can improve the effectiveness of cross-functional cooperation because trust can improve the effectiveness of the decision-making process and make the need to monitor behaviour less significant. Thus, based on the above discussion, it is reasonable to assume that there is a positive relationship between trust and the speed of new service development.

3.3 Performance measurement in new service development (NSD)

Managers typically used financial measurements, such as revenue or profit, to evaluate the performance of new service developments. Previous research has also increasingly used timeliness as an important measure to assess new service developments (Kessler and Chakrabarti, 1996). Time, cost and quality can be seen in previous research as the objectives and outcomes of new service developments (Tatikonda and Montoya-Weiss, 2001). Some researchers adopt a quantifiable measure, including market share and sales quantity, to assess new service performance (Griffin and Page, 1996). NSD performance can be seen as a multidimensional construct to reflect a project's or a firm's operational effectiveness and market competitiveness (Tatikonda and Montoya-Weiss, 2001). Some previous empirical studies have provided different dimensions of measurement to assess new service success or failure in service industries. De Brentani (1989) provides some different dimensions of measurement to assess NSD performance which include: 1) sales and market share; 2) competitive; 3) cost; and 4) other boosters. Fitzgerald et al. (1991) argue that the success or failure of an innovation can be measured by five criteria, namely, financial performance, competitiveness, quality, flexibility and resource utilization. Voss et al. (1992) provide an integrated assessment by including process and outcome measures to evaluate the performance of new service developments (as shown in Table 3.1). The integrated measurement of new service developments was based on the different level of the new service development process.

Table 3.1: Outcome and process measures of NSD

Outcome measures	Process measures
Financial measures Achieving higher overall profitability Substantially lowering costs for the firm Performing below expected costs Achieving important cost efficiencies for the firm	***Criterion cost*** Average development cost per service product Development cost of individual service product Percentage of turnover spent on developing new services, products and processes
Competitiveness measures Exceeding market share objectives Exceeding sales/customer use level objectives Exceeding sales/customer growth objectives Achieving high relative market share Having a strong positive impact on company image/reputation Giving the company important competitive advantage Enhanced sales/customer use of other products or services	***Effectiveness*** How many new services developed annually Percentage of new services that are successful

Quality measures	***Speed***
Resulting in service "outcome" superior to competitors	Concept to service launch time
Resulting in service "experience" superior to competitors	Concept to prototype time
Having unique benefits perceived as superior to competitors'	Prototype to launch time
Great reliability	Time to adopt new concepts from outside the firm
More user friendly	

Source: Adapted from Menor, L.J., Tatikonda, M.V. and Sampson, S.E. (2002) New Service Development: Areas for Exploitation and Exploration. *Journal of Operations Management*, Vol. 20, p142

Previous studies provide some useful measurements and suggest that there is a trade-off between these measurements. Clark and Fujimoto (1991) employ lead time, quality and productivity to measure the performance of new product developments. There is a positive relationship between the measurements of lead time and productivity. The longer the lead time, the more engineering hours have been spent on it. However, the relationship between productivity and quality is found to be negative, which means the high-end specialists are less productive. The relationship between lead time and quality also appears to be negatively correlated. Cohen, Eliashberg and Ho (2000) offer a modelling framework to examine the priorities of three measures of new product development: time-to-market, product performance and total development cost. Their research argues that these determinants of new product development can be correlated with each other. The result of their research shows a negative relationship between time-to-market and product performance and a positive relationship between time-to-market and intensity resource use. They also find that the target of development cost leads to premature product launch and product performance decline.

Based on Storey and Kelly's work (2001), the levels of performance measurement include: 1) project level, assessing the success of individual products/services and 2) programme level, assessing the success of new products/services over time. To analyze a range of service firms, they adopt Kaplan and Norton's (1993) classifications of performance measurement, consisting of financial performance, consumer-based performance, internal business process and learning and growth. They suggest that the first three classifications should be used in project level analysis, while the last should be adopted in programme level analysis. The financial measures include cost, profit-margin and stockholder benefit…etc. The customer-based measures mainly focus on customer satisfaction and quality. The internal process measures are, for example, the

speed of development, effectiveness of the process and long-term viability of the firm. The learning and growth measures include the number of new product launches, the percentage of successful new product launches, the average development cost per new product…etc. which have to be measured over time to find whether the firm is a success or a failure in new product development. Storey and Kelly's study (2001) also reveals that the use of performance measurements for new service development varies with the type of service firm. Less innovative firms often use financial measures to assess the performance of new service development. Customer-based measures are usually adopted by fast followers. The more innovative firms employed financial measures and some internal process measures to assess the performance of their new service developments.

From the above literature review, it appears that previous studies put more effort on the outcome perspective measurements, such as financial and competitiveness measures and some cost measures. The speed measures often use the lead time to assess the innovation performance in the manufacturing sector. Researchers may try in future research to assess the speed needed for the different stages of a new service development, such as the time needed from the idea generation to service launch. In the highly competitive environment of the Taiwanese convenience store industry, it is difficult to access the financial reports, development cost records and the number of new successful developments annually in the two services under review (the online shopping with pick-up at store service and the multiple media kiosk service) because of confidential issues. This may bring research up against the difficulty of using financial measures and criterion cost to assess the performance of each service development. The market competitiveness reports are also difficult to approach, due to their containing less statistical data to rank and measure the current competitive conditions in each of the services offered by research organizations. This consequence may in turn show up the difficulty of adopting competitiveness measures to assess the performance of each service development. Thus, this research uses speed as a process performance measure to evaluate new service development. This will be further discussed in Chapter 4.

3.4 The relationship between organizational routine and the speed of NSD

New product/service development can be achieved by a firm which exploits inter-organizational or inter-personal ties to acquire and assimilate external knowledge and to combine it with internal knowledge for value creation (Ancona and Caldwell, 1987). Dyer and Singh (1998) argue that the process of knowledge transfer can be maximized by greater social interaction between firms or individuals. In addition, Kalling (2003) suggests that management control routines and organization structure can enhance the possibility of successful knowledge transfer. Although the context of organizational routine was reviewed in section 2.7, this section discusses the influence of organizational routine on organizations in order to explore the relationship between organizational routine and the speed of new service developments.

According to the definition of organizational routine offered by Feldman and Rafaeli (2002), organizational routines can be seen as sources of connections and understanding between people involved in performing organizational tasks. The research cited above (2002) emphasizes the importance of connections. It is through these connections that people develop shared understanding. Additionally, organizational routines can be seen as recurrent connections between task-performing people. According to Monge and Contractor (2000), connections between individuals facilitate information sharing and increase the reliability of a partner's behaviours. Similarly, as Feldman and Rafaeli (2002) state, connections between individuals involved in a specific routine provide a chance to share different interpretations and to harmonize these to reach a common understanding. This implies that a participating individual is placed in a position using verbal and nonverbal communications with another individual to exchange information/knowledge and develop common understandings for accomplishing organizational tasks. The shared understanding among individuals helps to distribute cognition within a specific routine and create a knowledge reservoir for storing knowledge (Weick and Roberts, 1993; Cohen and Bacdayan, 1994). The common understandings between individuals which have to be developed include: 1) what kinds of task need to be done in a specific routine; and 2) why some actions are considered appropriate. The connections between individuals provide an opportunity to share knowledge. But how do individuals interpret

knowledge and achieve common understanding? Grant (1996) argues that common knowledge plays an important role in the process of knowledge transfer between individuals. The common knowledge allows individuals to transfer and integrate different domains of knowledge. Grant's research (1996) summarizes five types of common knowledge which can be used to achieve knowledge transfer and integration: language, other forms of symbolic communication, commonality of specialized knowledge, sharing meanings and recognition of individual knowledge domains. Moreover, Filiou (2007) argues that the lack of a common language and of previously shared experience may increase the inefficiency of knowledge exchange for executing the joint task, which may result in time delay between firms in accomplishing a sequence of tasks. Previous studies explain the reason that partner firms meet difficulty in predicting when it is their turn to offer appropriate actions for the execution of the joint task. This problem may increase the inter-firm conflict and reduce the partners' incentives to invest in assets (tangible and intangible) and to share essential knowledge for accomplishing the joint task (Lazaric and Marengo, 2000; Zollo et al., 2002). Furthermore, Hirunyawipada et al. (2010) also propose that common knowledge enhances interaction and collaboration between individuals and promotes the tacit knowledge of individuals to share and use collectively.

Illustrating social theory, some scholars argue that organizational routines can be seen as sources of inflexibility and inertia (Hannan and Freeman, 1983; Gersick and Hackman, 1990). However, other studies (e.g. Feldman and Rafaeli, 2002; Feldman and Pentland, 2003) challenge this traditional understanding of organizational routine and argue that organizational routine can be seen as a source of connection, understanding, flexibility and change. On the basis of these studies, the influence of organizational routine on organizations may be described in the following ways. First, routine can generate stability and adaptability through shared understanding between individuals, because they have to coordinate and adapt to each other in order to complete a specific task (Feldman and Rafaeli, 2002; Feldman and Pentland, 2003). Previous studies argue that the stability-providing effect of routine increases predictability; partners in the sequence of joint task and help coordination know when it is their turn to act (Nelson and Winter, 1982; Inkpen and Crossan, 1995). The organizational routine can be seen as an efficiently coordinating mechanism between actors to reduce the need for contracts

when the relationship between actors has become mature (Langlois and Robertson, 1995). Gittell (2002) further analyzes the performance effect of routine and finds that routine has a positive effect on a firm's performance because it enhances the interaction between participants in completing joint task. Moreover, the shared understanding between individuals also constitutes the procedural memory which specifies how things are done in particular ways. Routine can be seen as a knowledge repository in the firm, which represents the useful solutions to different tasks (Nelson and Winter, 1982; Teece and Pisano, 1994; Hodgson, 1998; Zollo and Winter, 2002). It also helps to understand how firms store, apply and change their productive knowledge. Productive knowledge may be held by individuals and organizations and stored in different ways (e.g. documents, databases and artifacts). But tacit knowledge cannot be stored in documents, databases and artifacts, though it is often held by individuals. Cohen and Bacdayan (1994) argue that the formation of routine speeds up the process of completing a specific task because it reduces the time for each replication. Second, recurrent shared understandings between individuals enhance their exchange and learning experience because participants' behaviours become more predictable. Thus, routines can reduce uncertainties and economize on cognitive resources because organizational routine can guide participants to search through experience and to preserve the 'scarce capacity' required to cope with exceptional and less-routine events (Hodgson, 1988; Dosi and Egidi, 1991). Becker (2005) also proposes similarly that increasing routinization can reduce uncertainty. His research examines the linkage between sequential variety and uncertainty and argues that routine can be interpreted as 'low sequential variety in recurrent interaction pattern'. Thus, to reduce the uncertainty involved in the sequence of actions which make up a new service development process, task uncertainty should translate into a lower degree of variation in the execution of the process (in other words, more routinization). Previous studies argue that uncertainty can be reduced by two effects of routinization: by fixing certain parameters, increasing predictability and by freeing limited cognitive resources (Hodgson, 1988; Baumol, 2002). Previous research also finds empirical evidence and shows that routinization can increase effectiveness in conditions of uncertainty (Gittell, 2002). Finally, some previous studies (e.g. Reason, 1990; Postrel and Rumelt, 1992) argue that organizational routine can simplify and accelerate the process of knowledge transfer and decision-making. The influence of organizational routine on organizations can be concluded to increase stability and predictability, reducing uncertainty and speeding up the process of information transfer

between individuals. Based on earlier literature on routine, the present study proposes that routine has a positive influence on the speed of new service developments. This is because routine can speed up the information transfer between participants and reduce the task uncertainty. It also helps to increase the predictability of participants' behaviours and further lowers the monitoring cost.

3.5 Summary

To understand how firms adopt and manage different inter-firm relationships to create new services and how firms develop routines for knowledge transfer between firms and internally in the process of new service development, the present study sought to contribute to the knowledge in the area of service innovation by developing a theoretical framework (see Figure 3.3). In this framework, the influence of inter-firm relationships and routine on the speed of new service development is empirically investigated (in Chapters 6, 7 and 8). The present chapter first reviews different dimensions of inter-firm relations. These include the intensity of inter-firm collaboration, interdependence and trust. Three forms of inter-firm collaboration – contract development, coordinated development and joint development – indicate different levels of intensity in inter-firm collaboration. On the basis of past research, this study speculates that there is a positive relationship between the intensity of inter-firm collaboration and the speed of new service development. The task complexity and project newness should be considered in this relationship. As regards interdependence, two sources of inter-firm dependence were identified: unique, valuable resources and switching cost. The present research proposes that mutual dependence has a positive effect on the speed of new service development. Moreover, the literature related to trust was reviewed and three types of trust were identified: contractual trust, competence trust and goodwill trust (Sako, 1992). In the light of past research, the present study postulates that trust positively influences the speed of new service development.

Second, outcome-performance (financial measures, competitiveness and quality) and process-performance (criterion cost, effectiveness and speed) measures used in new service development are reviewed. Due to the nature of the industry under study and the availability of information, speed is chosen as the measure in the present research to analyse the performance of new service developments.

Finally, the literature suggests that organizational routine can increase stability and predictability, reduce uncertainty and speed up the process of information transfer. Thus, the present study proposes that organizational routine positively influences the speed at which new services are developed.

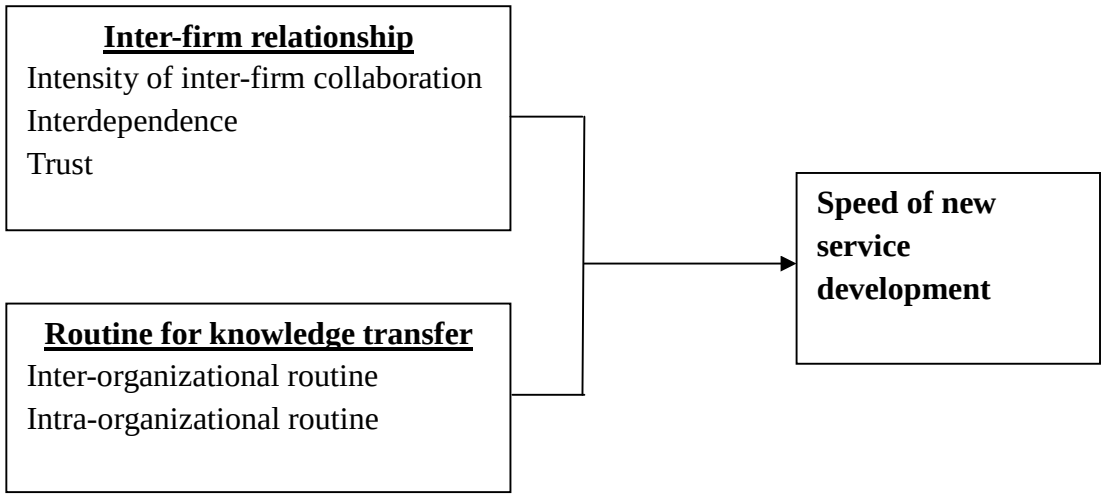

Figure 3.3: Theoretical framework
Source: Summarized by the author

Chapter 4: Research design, method and processes

4.1 Introduction

This chapter provides details of the research design and methodology in this thesis. It aims to justify the choice of research design and method in answering the research questions stated in Chapter 1. The first section generally illustrates the research paradigm and justifies the choice made as most suitable for the present research. The second section describes different research designs and clarifies why the research design of this thesis was adopted. The third section identifies the study population and unit of analysis for this research. The fourth section discusses its method of data collection. Then the method of data analysis is presented in the fifth section. Finally, the research seeks to explain the connection between the pilot work and the full-scale fieldwork. The first part shows how the pilot work in this research was carried out (comprising the initial research question, unit of analysis and criteria for selecting the sample, the data collection process and the data analysis process) and indicates what kinds of research finding were generated for answering the research questions and the data collection plan. The second part demonstrates the procedure of full-scale fieldwork (the revised research questions, unit of analysis and criteria for selecting the sample and the process of data collection and analysis).

4.2 Research paradigm

A suitable research strategy should be adopted before designing a research study. In general, the research strategy can be classified as one of two types of orientation: quantitative and qualitative. Bryman and Bell (2007) argue that these two types of research strategy represent different epistemological assumptions (positivism and interpretivism) and an ontology assumption (objectivism or constructivism). For example, quantitative research emphasizes the practices and types of the natural scientific model (positivism) in the representations of epistemology. Qualitative research for its part emphasizes the way in which individuals interpret their social world (interpretivism). Quantitative research comprises a view of social phenomena and its meanings as an external, objective existence (objectivism). Qualitative research embodies a view of social phenomena and its meanings as a continuous creation which individuals engage in (constructivism). Furthermore, the adoption of deductive and inductive approaches is also influenced by the above research philosophies. The

deductive approach represents the relationship between theory and research on the basis of theoretical consideration, developed from a hypothesis. Researchers collect data and identify research findings to test a developed hypothesis in order to indicate the common and different attributes between the theoretical hypothesis and the empirical findings. Comparatively, the inductive approach represents the relationship between research and theory, in which emphasis the theory is generated by research findings (Bryman and Bell, 2007). The deductive approach may involve qualitative and/or quantitative research. The inductive approach usually indicates qualitative research.

The position of the present study is in the middle ground between an inductive and a deductive approach. No theoretical framework was defined at the beginning of this research. It reviewed the current literature (e.g. that on open innovation, collaboration and networks in the innovation literature) to investigate the initial research question and acknowledge some expectation which could be used to guide the data collection and analysis in a pilot study. After finishing this, the research questions were revised and narrowed down to the present this research focus. Then the literature regarding to inter-firm relationships, routine was reviewed and to the specific outcome of new service development in this research was identified in order to develop a theoretical framework. This framework was meant to provide a guideline in the process of data collection and analysis in the fieldwork. It helped to link the present research to the existing knowledge in some subject areas, identify theoretical expectations and provide an initial analytical framework even though it incorporated an inductive approach (Saunders *et al*., 2003). Throughout the process of data analysis, new elements emerged which were not pointed out in the deductive analysis. The present study uses a qualitative research strategy to investigate the research questions and reach the research objectives because it can generate rich, detailed and contextual data, gain an understanding of underlying reasons and motivations and provide insights into the context of a problem. Qualitative research tends to view social phenomena and real life in terms of process because it often tries to uncover how events unfold and what patterns exist over time in social life.

4.3 Research design – a comparative case study

Bryman and Bell (2007) outline five different kinds of research design, namely, 1)

experimental and related designs; 2) cross-sectional design; 3) longitudinal designs (both panel studies and cohort studies; 4) case study designs; and 5) comparative designs. The definition of each research design is briefly as follows. The experimental design is unusual in business research because of the problem of dealing with a level of control of organizational behaviours. This research design has to allocate one of the experimental groups which are characterized as different types or levels of the independent variable and then find how these different types or levels result in different levels of variation in the dependent variable. The cross-sectional design is often called a survey design, which is defined as collecting data from more than one case at a time which contribute to the body of quantitative data to connect two or more variables in order to test the pattern of the relationship. The longitudinal design focuses on a sample for research purposes and surveys the sample again more than once in order to map the changes over time in the business research. The case study design contains detailed and intensive analysis in a single case. The types of case study can be single-case or multiple in design. The final type of research design is comparative, which is used to compare two or more meaningful cases in order to reveal different social phenomena and particular issues. Cross-cultural or cross-national research often applies this research design. Moreover, Yin (2003) argues that the adoption of a research strategy responds to three conditions: 1) the form of the research question; 2) the control required of behavioural events; and 3) the degree of focus on contemporary events as compared with historical events. The different research strategies are compared in terms of the above three conditions' these are shown in Table 4.1.

Table 4.1: Different conditions for different research strategies

Research strategy	*Form of research question*	*Control required of behavioural events*	*The degree of focus on contemporary events*
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival analysis	Who, what, where, how many, how much	No	Yes/ No
History	How, why	No	No
Case study	How, why	No	Yes

Source: Adapted from Yin, R. K. (2003) Case study research: Design and methods, 3rd

ed. Thousand Oaks, CA: Sage, p.5

Using the above research questions as a way of choosing a research strategy, case study is suitable for “how” and “why” questions. The technical definition of a case study can be illustrated as an empirical inquiry to investigate a contemporary phenomenon within its context in practice where it is believed that the contextual details may be closely connected to the phenomenon under study (Yin, 2003). The present research takes a comparative case study to investigate the research questions and achieve the research objectives. It aims to uncover much contextual detail in order to understand how convenience store chains adopt different inter-firm collaborations and organizational routines in the process of developing new services t and further investigates the influence of inter-firm collaborations and organizational routines on the outcome of new service developments.

After developing a research design of a case study, the researcher also has to consider the quality of the research design which is related to construct validity, internal validity, external validity and reliability (Yin, 2003). The construct validity is related to establishing correct operational measures. In a case study investigators have to use multiple sources of evidence and establish a chain of evidence in their data collection. They also have to invite key informants to review the draft of a case study report. The present research goes to two sources of evidence for its data: documentation and semi-structured interviews. Semi-structured interviews were conducted with key interviewees who fully understood the process of developing new services. As regards internal validity, it relates to the procedures of data analysis, such as using pattern-matching, explanation-building and addressing rival explanations. The data analysis of the present research will be based on pattern-matching and cross-case synthesis. This present study uses a theoretical framework to categorize and anatomize the collected data, recognize relationships and test the adequacy of the framework as a means to explain our research findings. If the patterns coincide, the internal validity of this present research will be strengthened. External validity is related to the process of designing a piece of research, for example, using theory in single-case studies or replication logic in multiple-case studies. It is always a major hurdle in writing case studies. Finally, researcher can use a case study protocol and develop a case study database to contribute reliability to the case study. This present research develops a case

study protocol before the process of data collection at the stage of the pilot study and the fieldwork.

4.4 Study population and unit of analysis

The study population of this research embraces the Taiwanese convenience store chains and their suppliers involved in service development. The four convenience store chains (namely, Company E, Company F, Company H and Company O) which together control 95.51% of the market in Taiwan were chosen in order to carry out all the required data collection tasks in my research case. Their suppliers, that is, the logistics company, IT system supplier, service content company and hardware manufacturing company, etc. were also chosen to fulfill required data in the present research.

Moreover, the unit of analysis is an important component of case study design because it directly relates to what the case is (Yin, 2003). The unit of analysis on which this research is conducted is a new service development project, with the intention of describing how a focal firm has adopted innovation in terms of the topics identified in the study. The two services selected for examination (the online shopping service with pick-up at store and the multiple media kiosk service) belong to the combination of "Clicks & Mortar" to consumers, which involves different actors (cross-industry) to implement the development of new services.

4.5 The method of data collection

Yin (2003) illustrates that researchers have to do some preparation before data collection, such as developing research skills in advance, developing a case study protocol and screening the nominations for a case study. To begin with, the investigator requires such skills as the ability to ask good question and to interpret data accurately, to be a good listener, to be flexible enough to adapt to different situations during the process of data collection, to have a firm grasp of the issues in order to avoid missing important evidence and to realize when deviations or divergences should be accepted, and to be unbiased, more sensitive and more responsive. In the development of a case study protocol, it should include an introduction to the case study, naming the research objective(s), case study issues, data collection procedures, with potential sites and persons to be visited, a data collection plan, guidelines for a case study report and case

study questions. Preparing a protocol for a case study increases the reliability of the research and points out which instruments, procedures and rules the researcher has to work with, whatever the case chosen, whether unique or a single case in a multiple-case study. To screen the nominations of a case study, the researcher much make a final selection of potential sites and persons. This present study assembled the above components (i.e. the research objective, potential sites and persons, data collection plan and case study questions) to produce the protocol of the case study before starting the process of data collection.

After discussing this preparation, Yin (2003) provides several sources of evidence including documentation, archival records, interviews, direct observation, participant-observation and physical artifacts. The present research chooses documentation and interviews as its sources of evidence. Documentary information is often used for data collection for a case study. There are many forms of documentary information to collect and an explicit data collection plan is helpful. These forms of documentary information include: letters, memoranda, minutes of meetings, written reports, proposals, progress reports and newspaper and other clippings from the mass media. The strength of documentation is that it is stable, unobtrusive, exact and broad in its coverage. In contrast, it also may have some shortcomings, such as retrievability, biased selectivity, reporting bias and an access problem. The present research collected documentary information to identify the service content, such as the service framework and the work in which the suppliers had been involved. Secondary data were collected from periodicals, books, magazines, newspapers, research reports published by research institutes and annual reports from the case companies' and suppliers' websites.

Additionally, this research also adopted interview to collect relevant information for the case study. Yin (2003) also describes three types of interview: open-ended, focused and structured, which can be used in response to different purposes and situations. Interview helps a researcher to focus on a case study topic and provides some insights into the evidence. But the researcher also has to avoid some problems with interviews, such as response bias, interviewees giving the answer which they suppose the interviewer wants, poorly constructed questions resulting in biased answers. Bryman and Bell (2007) argue that qualitative interviewing tends to be more flexible; the interviewee's response may lead to an adjustment of emphasis in the research when a significant result emerges.

They also mention that qualitative interviewing has two types of approach: unstructured and semi-structured, which focus on explaining and understanding the interlocutor's view of specific events, patterns and form of behaviour. Unstructured interviews tend to be like conversation in which the interviewee is asked questions on a range of topics. The researcher compiled a list of questions which can be seen as an interview guide in specific topics in a semi-structured interview. The present research adopted semi-structured interviews as a method of data collection; they allow two-way communication and the flexibility to probe for details, besides offering a range of insights on the research issues. Moreover, Bryman (2008) provides some tips and skills for preparing interviews, on such things as preparing an interview guide and transcribing and translating interview data. Focused on the preparation of an interview guide, the present study creates a certain research topic which starting from the research questions to be answered, formulates interview question and controls language use. The transcription can preserve a whole interview conversation, but it is very time consuming to make. All the interviews in this research were fully transcribed. Relevant interview extracts were translated from Chinese into English by the author, who is bilingual.

4.6 The method of data analysis

For data analysis in qualitative research there are methods of various kinds, such as analytic induction, grounded theory, narrative analysis (thematic analysis, structured analysis, interactional analysis and performative analysis) and secondary analysis can be made in terms of different data and purposes. Gibbs (2008) defines qualitative analysis as involving two kinds of activity. The first develops an awareness of the data which can be examined and further described and explained. The second relates to a number of practical activities which can be performed with different kinds of data or evidence, to examine them further. Next, the coding of the collected data is a way to index or categorize the initial data which can be used to develop a thematic framework. It can help the researcher retrieve and categorize the data with codes given by the researcher into groups which exemplify the same idea, explanation or activity. It also helps researcher to use the listed codes to examine the conceptual framework and research questions. Moreover, Yin (2003) provides three strategies to analyze the evidence in a case study; these are theoretical propositions, rival explanations to establish a framework and developing case descriptions. It is preferable to follow the theoretical

propositions because the objectives and design of case studies were initially developed by these propositions in order to explore the research questions and achieve the research objectives. These theoretical propositions shape the data collection plan, help the researcher to focus on the relevant data and define the alternative explanations to be examined. The present study will follow the theoretical proposition strategy in shaping the design of the case study.

Furthermore, Yin provides five specific methods of analysis for case studies: pattern matching, explanation building, logic model, cross-case synthesis and time-series analysis. The present study adopts the methods of pattern matching and cross-case synthesis in its analysis. The pattern matching will be relevant in its descriptive approach, as long as the data collection follows the predicted patterns as defined. The results of pattern matching help increase the internal validity of a case study if the empirically based patterns coincide with the predicted patterns. In terms of multiple case design, this research further applies a cross-case synthesis to analyze multiple cases, although pattern matching can be adopted with either single-case study or multiple-case study. This technique was specially adopted to analyze a multiple-case study because the findings of analysis tend to be more robust and fruitful than the findings of a single case. This technique takes each individual case as an independent study. Word tables can be created to display the data from individual case studies in terms of a consistent framework for data analysis.

4.7 Research process

This section describes the research process adopted. It illustrates how the case study was executed and focused in order to explore the research questions and achieve the research objectives. The research processes in this fell into two stages. The first stage inevitably was a pilot study. The pilot study was used to refine the initial research questions into something more specific, improve the data collection plan and the procedures to be followed and help the development of the full-scale investigation. After narrowing down the focus of research by the pilot work, this research revised some parts of the research questions and developed a conceptual framework to guide the data collection and analysis in the fieldwork stage.

4.7.1 The first stage of research process- pilot study

This research initially aimed to investigate how and why Taiwanese convenience store chains use inter-firm collaboration with external firms in order to shape new service developments. Moreover, this research also explores how Taiwanese convenience store chains utilize broad inter-organizational or inter-personal ties to absorb external knowledge and share its internal knowledge with external firms in developing new services. The research reviewed the related literature on open innovation, supplier involvement and integration and absorptive capacity in order to identify some relevant factors to investigate initially. To investigate the collaboration between convenience store chains and external firms, the initial research focused on the concept of supplier involvement and integration in developing a new service in order to understand what kinds of relationship between firms have been made to enhance the success of new service developments. Some aspects of supplier involvement and integration were used in the pilot study, including: the timing of the involvement, level of responsibility, intensity of cooperation and degree of technological change. Moreover, the pilot study also used some aspects of absorptive capacity, including the frequency and intensity: of communication, nature of routines and structures and level of prior relevant knowledge in order to investigate the knowledge transfer between firms and within convenience store chains in the process of developing a new service.

The initial research purposes led to the following research questions being adopted for pilot study use in order to narrow down the focus of research. The pilot study helped the research to reveal and identify the more specific and related factors which may affect supplier involvement or the absorptive capacity of convenience store chains to develop achieve new services. The research questions of the pilot study were as follows:

1) What aspects of supplier involvement and integration most influence successful new service developments, such as the timing of the involvement, level of responsibility, intensity of cooperation and degree of technological change?
2) What aspects of absorptive capacity of the chain convenience store most influence successful service development, such as the frequency and intensity of the communication, nature of routines and structures and level of prior relevant knowledge?

4.7.1.1 Unit of analysis and criteria for selecting samples

Two of the dominant convenience store chains (namely, Company E and Company F) in Taiwan were selected in order to carry out all the required data collection tasks during my pilot study. The unit of analysis was a new service project. The pilot study chose three types of service project: the pre-order service (one kind of catalogue shopping), the multiple media kiosk (MMK) service, and the online shopping with pick-up at store service which were created by the convenience store chains. This is because convenience store chains used existing advantages (e.g. 24-hour service, high density of store spread, robust information systems and professional distribution systems) and cooperated with different companies to provide these service developments in order to attract consumers' visits and increase the turnover of each convenience store. These service developments also integrated different functions (e.g. IT systems and logistic functions) with external companies for information flow and/or logistics flow in the process of developing the new service. For example, the development of the online shopping with pick-up at store service was on the basis of existing advantages of a convenience store chain, cooperating with external companies and an integrated IT system for information flow and logistic flow between different companies. The initial research selected these three different service developments to explore the initial research questions.

4.7.1.2 The process of data collection

The process of collecting data for the pilot study took four- months, from October 2007 until February 2008. Two methods of data collection were used in this pilot work: documentation and interview. With respect to the data collection, the pilot study collected documentary information to identify the service contents, such as the service framework and which suppliers had been involved. Secondary data was collected from periodicals, books, magazines, newspapers, research reports published by research institutes, annual reports published by case companies and suppliers and firms' websites.

Interviews were conducted with the managers, section staff of the focal companies and the staff of partner firms who were involved in whole process of the selected service development. The Taiwanese convenience stores industry has a highly competitive environment, leading to difficulty in accessing useful information. This is because the convenience store chains worry that the development process of new services may be

learned or copied by their competitors. Additionally, two of these services have been developed over a long time, notably the online shopping with pick-up at store service (almost 10 years). The fact that some staff had left their original companies or joined another project/related company increased the difficulty in arranging interviews. In contrast, the other service (the MMK service) is still being developed and the team members were not willing to accept our invitations to be interviewed because of the confidential clause in their contracts. Consequently, gaining access to some interviews had to rely on introductions from the interviewees who responded during the pilot study. The potential sites and interviewees for the case study of Company E. included a marketing group, the IT department of Company E and different kinds of functional suppliers (e.g. an IT system supplier and/or logistics companies) in each service. The other case study, of Company F, planned to interview the product division and IT division of Company F, different kinds of functional suppliers (e.g. the IT system supplier and logistics companies). 21 interviewees from Company E, Company F and their suppliers, who fully understood the process of developing these three services participated in the semi-structured interviews in the pilot study. The duration of each interview was approximately 1 -1.5 hours. The list of interviewees in the pilot study is shown in Table 4.2.

Table 4.2: The list of interviewees in the pilot study

Company E	**Company F**
1. Section staff (MMK service) 2. Previous marketing section staff (online shopping with pick-up at store service) **Suppliers:** ***1. Online shopping with pick-up at store service:*** Manager of Third party distribution company (3 interviewees) ***2. MMK service:*** 1) Manager of hardware manufacturing company 2) Staff of applied IT system supplier ***3.Pre-order service:*** 1) Manager of product supplier	1. Marketing section manager (MMK and online shopping with pick-up at store service) 2. Marketing section staff (MMK service) 3. Marketing section staff (online shopping with pick-up at store service) 4. Marketing section manager (Pre-order service) 5. Marketing section staff (Pre-order service) 6. IT department manager associated with these services 7. IT section manager associated with these services 8. IT section staff (MMK and online

	shopping with pick-up at store service) 9. IT section staff (Pre-order service) **Suppliers:** ***1.Online shopping with pick-up at store service:*** 1) Manager of Third party distribution company (3 interviewees)- the same as in Company E 2) Previous manager of Company C 3) Staff of IT system supplier ***2. MMK service:*** Senior manager of hardware manufacturing company ***3. Pre-order service:*** 1) Manager of product supplier- the same as in Company E

Source: Summarized by the author

Two sets of research questions were used in the pilot study (as shown in Appendix 1). These two sets were also reviewed by the research supervisor and further examined by an academic researcher who has previous experience of semi-structured interviews, in order to improve the reliability of interview questions for use in the pilot study. One set of research question had been developed to find out from the convenience store chains the nature and influence of their supplier involvement and the absorptive capacity of convenience store chains regarding three kinds of service. The other set of research questions for service providers and cooperators had been developed to understand the nature and influence of supplier involvement and integration in three kinds of service.

4.7.1.3 The process of data analysis

The pilot study used a thematic framework to analyze the interview data (Gibbs, 2008). The transcription of verbal data was made from the Chinese version. This research drew on the existing literature and research questions to create codes and to identify key thematic ideas. The themes, including the timing of supplier involvement, the resource merits of a new service development, intensity of inter-firm collaboration, supplier assessment and the responsibility of the supplier, had to be used to sort out the initial data in order to understand how Taiwanese convenience store chains acquire and use

external resources/ knowledge to assess the appropriate firms and make different types of relationship in the process of developing a new service. At the same time, some themes were also developed, including the channel of external communication between firms and the channel of internal communication within convenience stores in order to explore how Taiwanese convenience store chains use different types of interaction to acquire, absorb and transform the related knowledge/ resources with their cooperative firms. After initial data categorization, cross-case synthesis was chosen as the analytical technique in the pilot study to summarize the findings from the individual cases and to identify the similarities and the differences between the two convenience store chains.

The main findings of the pilot work are illustrated below; they provided the basis for revising the research questions and achieving the research objectives. These findings of the pilot study helped this research to narrow down the focus of the research. First, the pilot study found that ***the inter-firm relationship between convenience store chains and external companies in developing new service was on the basis of different degree of intensity of inter-firm collaboration, interdependence and trust.*** The convenience store chains in developing new service initially used different kinds of contract with partner firms, such as contracts made by project or by year. According to previous studies, the different levels of supplier integration illustrate a range of different intensities of cooperation (e.g. contract development, coordinated development, joint development) on the basis of the responsibility of suppliers in the process of developing new products (Petersen *et al*., 2005; Fliess and Becker, 2006). In its pilot, the present study used the theme of responsibility of supplier to identify the different levels of supplier integration between convenience store chains and suppliers. The findings of the pilot study show that convenience store chains often used a high intensity of cooperation (e.g. coordinated development or joint development) with suppliers in important functions (e.g. IT and logistics). Convenience store chains also cooperated with some suppliers on the basis of low intensity of cooperation (contract development). Moreover, the finding of the pilot study show that convenience store chains often cooperated with the same suppliers to develop important functions in different service projects. For example, convenience store chains cooperated with the same IT system suppliers to develop different new service projects because the IT system of convenience store chains is highly customized. For convenience store chain it is difficult to change existing suppliers in IT system function development because of

considerations of system stability. In order to decrease opportunistic behaviour on the part of these suppliers, convenience store chains often establish a long-term cooperative relationship with them and use majority ownership or incentive rewarding with goal alignment to manage them. Convenience store chains also used existing advantages and cooperated with suppliers to acquire valuable resource in the process of developing a new service. Finally, our pilot study also found that convenience store chains often cooperated with suppliers on the basis of previous cooperation experience and the good reputation and capability of suppliers. Convenience store chains often cooperate with their existing partners in the process of developing a new service. This is because the chains fully recognize suppliers' capability on the basis of previous experience of cooperation, leading to low monitoring costs. Convenience store chains also cooperated with suppliers on the basis of the suppliers' reputation in a specific domain. In short, the convenience store chains cooperated with their service suppliers on the basis of trust (previous cooperative experience, reputation and the capability of the supplier) and interdependence (financial hostages, switching costs and valuable resources). Convenience store chains also used different degrees of intensity of inter-firm collaboration with suppliers in the process of developing a new service.

Second, the pilot study also found that ***convenience store chain mainly used different organizational routines between firms and internally to absorb related knowledge and share internal knowledge in the process of developing a new service.*** The convenience store chains have different organizational routines for sharing knowledge with their suppliers. Mostly, they used formal meetings (e.g. project meetings and functional meetings) with external companies for knowledge transfer in order to identify project requirements and specifications, share related information/knowledge, recognize the potential problems and review the progress of the development in the process of developing a new service. The staff on both sides also used peer-to-peer discussion and telephoning to discuss and confirm views on problems before holding a formal meeting. Moreover, hierarchical meetings were also adopted from time to time (sectional, departmental, cross-departmental meetings) within the convenience store chain to discuss and assess a new service project. The project meeting was set up with different departments and held periodically to discuss functional requirements, coordinate resources from different departments and review development progress in developing the new service once the development decision had been made by a senior manager. The

headquarters of the convenience store chains also periodically offered convenience store documentation (an operation manual and internal announcement) to update the existing operation manual in order to teach store staff new service procedures. The staff of different departments may use peer-to-peer discussions and telephone calls to discuss and confirm views on problems before holding a formal meeting.

With the above main findings, the pilot study was able to help this research to explore some useful terms and narrow down the focus of study. More specifically, it helped:

1) To provide an overview of the development process of the selected service, its service framework and its actors. These findings give this research guidance in identifying which staff and companies to interview in each selected case and further ensured the possibility of accessing the required data in possible choices of site and staff.
2) To refine the initial research questions into more specific ones, the conclusions of the pilot study helped this research to focus better on the role of different degrees and types of inter-firm relationship (i.e. intensity of inter-firm collaboration, interdependence and trust) and different organizational routines for knowledge transfer in the process of developing a selected service.
3) To investigate and practice the interview questions to be asked and refined during the full-scale investigation and explore the conceptual framework which was built on the work of different writers, such as scholars of open innovation, networking and collaboration on innovation, organizational routine…etc.

Based on the main findings of the pilot study, the focus of research became to investigate how different degrees and types of inter-firm relationship and organizational routine were operated and further affected the outcome of developing a new service for cross-case comparison in different service projects. More specifically, the research task was to explore the following questions:

1. How do different types and degrees of inter-firm relationship influence the outcome of new service development?
2. How do different types of organizational routine influence the outcome of new service development?
3. In what ways do the different types of service development affect the different types of inter-firm relationships and organizational routines associated with the outcome

of new service development?

4.7.2 The second stage of research process – full-scale fieldwork

The pilot study of the present research found that Taiwanese convenience store chains establish different types and degrees of inter-firm relationship with external companies in the process of developing a new service in terms of different degrees of intensity of inter-firm collaboration, interdependence and trust. Moreover, the pilot study also found that Taiwanese convenience store chains used different organizational routines between firms and internally to absorb related knowledge and share internal knowledge in developing a new service. These main findings helped narrow down the focus of research on how and why Taiwanese convenience store chains adopt different degrees of inter-firm relationship and to further explore the association between the inter-firm relationship and the speed of developing a new service. Moreover, the convenience store chains adopt different organizational routines for knowledge tranfer and moreover its influence on the speed of developing a new service also merits further investigation. In addition, this research compares different types of service project to see if similarities and differences may result from the above relationships between variables. According to the main findings of the pilot study, The present study further supplies a literature review on inter-firm relationships (focusing on intensity of inter-firm collaboration, interdependence and trust), a performance measurement for developing a new service, an and an organizational routine for developing a theoretical framework which can be used to underline the main variables and explore the expected relationships among variables. However, in the case of the highly competitive convenience store industry in Taiwan, financial reports and cost records documenting the development of the two selected services were difficult to access in this research because they were confidential. The present research could collect only limited information from newspapers or magazines which revealed how many consumers used the selected services in one or two years in the development of a new service. But this could not be used to assess financial measures or quality measures because of the service charges made by the convenience stores are not shown. In terms of the above restrictions on data collection, this research uses process measurement in particular for the speed of developing a new service for evaluation. Semi-structured interview was used to investigate the period needed for developing a new service which leads to how much time must be spent to develop selected services. As a result, the present research adopts process measures in

terms of the speed of developing a new service to evaluate innovation outcomes. The measurement of the time taken from the concept to the service launch is adopted to evaluate the performance of developing a new service and make cross-case comparisons.

4.7.2.1 Unit of analysis and criteria for selecting samples

The pilot work had done parts of the investigation into the two convenience store chains (Company E and Company F). The samples of fieldwork focused on four dominant convenience store chains in Taiwan (Companies E, F, H and O) and their service suppliers involved in two selected services, for full-scale investigation in this research. For the project level analysis, the focus of research chose only the multiple media kiosk (MMK) service and the Online shopping with picking up at convenience store service created by the chain of convenience stores. This is because the pre-order service is only one kind of catalogue shopping service in which many product manufacturers are involved by using selling contracts to support this service development. The convenience store chains did not put much effort into developing this service because its development is based on minor changes to an existing payment system and logistical system which support it. Comparatively, the multiple-media kiosk (MMK) service is one kind of change in the client interface which has invested new hardware for its sake and which involves different types of existing and new service content companies (e.g. bill payment service companies and web-based service content companies) to develop this service in order to enrich the service contents of the kiosk so as to attract consumers to sample it. Convenience store chains use different degrees and types of inter-firm relationship with different actors (e.g. IT system suppliers, hardware manufacturing company and service content companies) for different functions in developing this service. Additionally, the Online shopping with pick-up at store service exemplifies one kind of newness in a delivery system because it integrates exist logistical systems and allows consumers to collect their purchases without specifying a delivery time or site (such as an office or home). Convenience store chains also used different degrees and intensity of inter-firm relationship with different actors (e.g. IT system suppliers, logistic companies, third party distribution company and e-shops) to integrate different functions and contribute this service development. A detailed introduction to these services and their framework are shown in Chapter 5.

4.7.2.2 The process of data collection

With respect to the data collection, the fieldwork collected documentary information to identify different suppliers involved in the process of the two selected service developments in Company H and Company O. This documentation can be collected from periodicals, books, magazines, newspapers, research reports published by research institutes, annual reports from case companies and suppliers and firms' websites.

Semi-structured interview was adopted in the process of data collection in the fieldwork. The potential sites and interviewees included the staff of the marketing and IT departments and different kinds of functional suppliers (e.g. IT system suppliers and/or logistics companies) in each service for each case study. For example, MMK service development involved different actors, including: IT system suppliers, a hardware manufacturing company and service content companies which would all be invited to take part in the interviews. The present study also invited different actors to participate in the interviews (e.g. IT system suppliers, third party distribution companies, staff of a distribution company owned by the convenience store chain and applied IT system suppliers) who were involved in developing the Online shopping with pick-up at store service. There are also two sets of research questions used in the fieldwork (as shown in Appendix 2). These two sets of interview questions are also reviewed by the research supervisor and the other two academic researchers who have relevant experiences and skills in semi-structured interviewing in order to improve the reliability of the interview questions. One set of research question were put to the staff of the convenience store chain to discover information by means of the listed interview questions. The other set of research questions were put to the service providers and cooperators in order to investigate the facts by means of listed questions and compare the answers with the views of the focal company. Semi-structured interview was conducted with members of staff from four convenience store chains and their service suppliers to discuss the various items listed in the research question (31 interviewees). 10 of them then gave a second interview in order to further discuss the revised question which yielded useful information for data analysis. The list of interviewees in the fieldwork is shown in Table 4.3.

Table 4.3: The list of interviewees in fieldwork

Company E	**Company F**
1. Previous marketing section staff (MMK service) 2. Previous marketing section staff (online shopping with pick-up at store service) **Suppliers:** ***1. Online shopping with pick-up at store service:*** 1) Manager of Third party distribution company (3 interviewees) 2) Previous manager of IT system supplier 3) Previous manager of self-owned distribution company 4) Senior manager of marketing company (Company P) ***2. MMK service:*** 1) Project manager of Company Q 2) Manager of applied IT system supplier 3) General manager of service content company (ticket sales system) 4) Manager of service content company (web-based ring tune company) 5) Manager of service content company (web-based ring tune company) 6) Manager of service content company (web-based fortune telling) 7) Senior manager of service content company (web-based test analysis service)	1.Marketing section manager (MMK and online shopping with pick-up at store service) 2.Marketing section staff (MMK service) 3.Marketing section staff (online shopping with pick-up at store service) 4. IT section staff (MMK and online shopping with pick-up at store service) **Suppliers:** ***1.Online shopping with pick-up at store service:*** 1) Manager of third party distribution company (3 interviewees) – the same as Company E 2) General manager of Company C 3) Previous manager of Company C 4) Previous manager of third party distribution company 5) Manager of applied IT system supplier 6) Previous manager of IT system supplier 7) General manager of self-owned distribution company ***2. MMK service:*** Senior manager of hardware manufacturing company
Company H	**Company O**
1. Project manager (MMK service) 2. Marketing staff (online shopping with pick-up at store service) **Suppliers:** ***1.Online shopping with pick-up at store service:*** Interviewees are the same as for	1. Project manager (MMK service) 2. Marketing staff (online shopping with pick-up at store service) **Suppliers:** ***1.Online shopping with pick-up at store service:*** Interviewees are the same as for

Company F ***2. MMK service*** Manager of service content company (ticket sales)	Company F

Source: Summarized by the author

This section clarifies what kind of initial data were collected and retained, which samples and projects were selected, what kinds of method were adopted, the duration of data collection, number of interviewees and duration of each interview at different stages: the pilot study and fieldwork are shown in Table 4.4.

Table 4.4: The duration, methods, selected services, cases and collected data in different stage of data collection

Data collected in Pilot study	**Data collected in Fieldwork**
1.The duration of data collection: October 2007-February 2008 **2. The methods of data collection:** Documentation and interview **3. Case company:** Company E, Company F **4. Selected services:** MMK service, Online shopping with pick-up at store service and Pre-order service. **5. Collected data:** *Overview of the Taiwanese convenience store industry, which includes: structure, actors (convenience store and its partner firms) and services. *The framework of selected services, which includes: development process, structure, actors (convenience store and its partner firms) and responsibility of service development in each firm. *The partner firms' assessment of resources for service development in a chain convenience store. *The types of communication between firms and within a chain convenience store during the process of service development.	**1.The duration of data collection:** May 2008-September 2008 **2. The methods of data collection:** Documentation and interview **3. Case company:** Company E, Company F, Company H and Company O **4. Selected services:** MMK service and Online shopping with pick-up at store service. **5. Collected data:** *The framework of selected services in Company H, Company O, which includes: development process, structure, actors (convenience store and its partner firms) and responsibility of service development in each firm. *The resources of service development, using different inter-firm relationships for knowledge transfer between firms in selected service development. *The different levels of routine for knowledge sharing between firms and within a chain convenience store during process of service development. **6.Number of interviewees:** 31 **7.Duration of each interview:** 1-1.5 hours

*What factors may influence the knowledge sharing between firms such as degree of trust between firms. **6. Number of interviewees**: 21 **7. Duration of each interview:** 1-1.5 hours	

Source: Summarized by the author.

4.7.2.3 The process of data analysis

As stated in Section 4.6, this research follows the strategy of theoretical proposition and uses techniques of pattern matching and cross-case synthesis. The transcription of verbal data was made in the Chinese version. Saunder et al. (2003) suggests that the general process of qualitative analysis involves the following steps: 1) categorization; 2) “unitizing” data; 3) recognizing relationships; and 4) developing and testing hypotheses to find conclusions. In the pattern matching logic, the fieldwork used different patterns which were based on the variables of a developed theoretical framework for data categorizing. These patterns included the resources for developing a new service, the dimension of service innovation, intensity of inter-firm collaboration, responsibility of supplier, interdependence between collaborative firms, degree of trust between collaborative firms and speed of developing a new service, which should be used to sort out the initial data in order to understand how Taiwanese convenience store chains use different degrees and types of inter-firm relationship with external firms to acquire and use external resources/knowledge and what influence this has on the speed of developing a new service. Moreover, this research also developed some patterns which included the formal and informal communication with external firms, formal and informal communication within the convenience store chain and the speed of developing a new service in order to identify how a Taiwanese convenience store chain uses different mechanisms of organizational routine to deliver the related knowledge/resources to their cooperative firms and internally. The question of how organizational routine influence the speed of developing a new service was also investigated. Then the present study selected the correct number of words, sentences and complete paragraphs to fit each category in order to unitize the collected data. In empirical work, the relationship between variables will be recognized by using generated categories and comparing them with the expected relationship in theoretical framework. If the patterns coincide, the result helps to strengthen the internal validity of

the case study. Moreover, the technique of cross-case synthesis was adopted to analyze a multiple-case study because this technique tends to produce more robust, fruitful findings than are yielded from a single case. The present study follows the technical process to create word tables on the basis of different patterns from the theoretical framework. The word tables perform the empirical data from individual cases, which help identify the similarities and the differences between individual cases.

4.8 Summary

This chapter clarifies the research design and method and illustrates the context of the research process (the pilot study and the fieldwork) in this thesis. This chapter argued that a qualitative study is better for investigating the present research questions and achieve the research objectives of this research. This is because a qualitative study can generate contextual data and gain a better understanding of the underlying reasons and provide insights into the context of a problem. The research design was based on a comparative case study to investigate “how” and “why” Taiwanese convenience stores adopt different degrees and types of inter-firm collaboration with external firms and further explore what connects an inter-firm relationship and the speed of developing a new service. Moreover, this research also investigates how convenience store chains adopt different organizational routines for knowledge transfer and what influence this has on the speed of developing a new service. In order to investigate the main issues, the two services selected for examination were the Online shopping with pick-up at store service and the multiple media kiosk (MMK) service. The study population of this research embraces the Taiwanese convenience store chains and their suppliers involved in this service development. This research used documentation and semi-structured interviews to collect its essential data and adopted pattern matching and cross-case synthesis for data analysis in order to strengthen the reliability and validity of the case study. Finally, this chapter illustrated how the two-stage research process in this research was executed. It was useful for clarifying the research questions and narrowing down the research focus for the full-scale investigation.

Chapter 5: The Taiwanese convenience store industry and two selected services – an introduction

5.1 Introduction

The Taiwanese convenience store industry has become a highly competitive because of the high number of stores. To operate in such a competitive environment, the convenience store chains must integrate knowledge/resources from multiple sources (e.g. IT system suppliers and logistics) and continually introduce innovations, which in turn, help them respond quickly to market dynamics. The convenience store chains use IT systems to analyze consumers' purchasing patterns and provide useful information to upstream suppliers who are seeking to produce suitable goods. Moreover, they also cooperate across industrial boundaries (e.g. with the financial services industry and the online game industry) to develop different services in order to increase their profit margin and attract more consumers' visits. For example, convenience store chains have used their existing advantages (24-hour service, high density of distribution of stores, robust information systems and professional distribution systems) to provide "Clicks and Mortar" services and have integrated different actors (cross-industry) to implement the development of new services, such as the two services (the online shopping with pick-up at store service and the multiple media kiosk service) selected here for examination. In conclusion, Taiwanese convenience store chains often establish different types and degrees of inter-firm relationship with external firms to acquire their essential resources/knowledge and share existing advantages in order to contribute new service developments. Moreover, in developing new services they use different organizational routines between firms and internally to acquire and transfer essential knowledge. The present research further explores how different degrees and intensity of inter-firm relationships and knowledge transfer routines influence the speed at which new services develop in this industry.

This chapter first defines and characterises convenience stores to identify the scope of their activities. It adopts the concept of a sectoral system of innovation which points to the source of innovations and the linkage interaction between convenience store chains and their partners in this context. It goes on to compare different convenience store chains on the basis of different degrees and intensity of the inter-firm relationship with

external firms. Second, this chapter introduces the two convenience store services under particular review: it identifies the actors involved in the process of service development, classifies the dimensions of innovation and identifies the different degrees and scope of the novelty and complexity in these two services.

5.2 The definition and characteristic of convenience store

Convenience stores originally stemmed from the developments in the Southland Ice Company in the U.S.A. in 1927. Its opening hours were 7am to 11pm which gave it the brand name of 7-11. This chapter first illustrates the definition of the term ‘convenience store’ in order to distinguish it from other general merchandise outlets, such as department stores, hypermarkets and supermarkets. The definition of convenience store made by the Manufactual CVS Research (MCR) from Japan comprises these features: 1) the sales area of a convenience store is often between 66 and 232 square meters; 2) food sales must occupy at least 50% of the total sales in each store; 3) the turnover of each good must not exceed 50% of store turnover; 4) its opening hours are longer than those of other stores (24 hours a day and everyday operation throughout the year; 5) the method of selling is self-service, in which the customer picks up the goods from the shelves and makes a payment at the exit counter; 6) the convenience store has to provide friendly and cordial service and a highly interactive relationship with consumers; 7) in order to achieve efficiency of operation, the convenience store also has to invest in more equipment than other industries such as point of sale system (POS) and electronic order system (EOS); 8) it should need few staff to operate it (Ministry of Economic Affairs, R.O.C., 1994). Moreover, the Taiwan Institute of Economic Research also provides definition of ‘convenience store’, stating: 1) the sales area of a convenience store is between 49.5 and 231 square meters; 2) food must occupy at least 50% of the total sales items in each store; 3) its opening hours must be at least 14 hours per day, 340 days a year; 4) the equipment of a convenience store must include a cash register, anti-theft system and the equipment and systems which make store the operate more efficiently.

Based on the above different definition of convenience store from different institutes, this research defines the convenience stores of the chains in Taiwan as follows: 1) it opens for 24 hours every day; 2) its sales area should be between 82.5 and 132 square

meters; 3) food must occupy at least 50% of the total sales items in each store; 4) the store should also sell household goods and provide such service products as a bill payment, pre-ordering and catalogue shopping; 5) the number of sales items may vary between 2000 and 3000; 6) the turnover of products is very rapid, replacing items as consumers pick them off the shelves; 7) consumers pay at the counter and are served by a few store staff; 8) the store often uses franchising to increase the number of its outlets expand in order to achieve efficient and low cost management and it often applies high technology (e.g. POS and EOS systems) to deal with the store and sales management.

In addition, Liao (1978) argues that convenience stores have some characteristics which can be used to distinguish it from other types of general merchandise retailing (e.g. department store, hypermarket and supermarket), as follows:

1) *Convenience of location*

   Convenience stores are set up in residential areas, among office buildings and factories, which allow consumers to visit them on foot.

2) *Convenience of time*

   Convenience stores often operate 24 hours per day. Consumers can buy the goods they need at any time.

3) *Convenience of product*

   Convenience store use IT systems to recognize and analyze consumers' preferences and quickly respond to consumers needs by providing popular goods and services.

4) *Staff courtesy*

   Store staff should provide courteous service to consumers and make them feel comfortable.

5) *Modern stores and equipment*

   To support franchisees, the head office of a convenience store chain provides comprehensive solutions (e.g. analyses of store location, product purchasing and distribution, the placing of goods and equipment and schemes for store decoration). The head office also establishes different IT systems (e.g. POS systems and EOS systems) to manage widely-spread convenience stores, help the head office to respond quickly to the needs of each store and minimize the time and human resources spent on this. The head office of a convenience store chain also sets up different distribution systems on the basis of different temperatures (4°C, 18°C,

normal atmospheric temperature and papers including newspaper and magazine) in order to increase the frequency of distribution and respond to the specific characteristics of different orders (e.g. lower quantities, a wider range of items).

6) *Operation by a few staff*

Convenience stores are operated by small numbers of staff. Part-time staff take many of the total staff hours. The head office has to provide different types and levels of training (e.g. operation manuals, online training and supervision) to simplify the task of learning to carry out the different service procedures.

5.3 The convenience store industry in Taiwan

The Taiwanese convenience store industry involves different actors in such areas as logistics, products and services, IT services (software and hardware companies) and consumers in the sector. The head office of a convenience store chain has to cooperate with external companies, such as IT system suppliers and logistics companies offering essential resources/knowledge to contribute new service developments. In order to operate business in such a highly competitive environment, convenience store chains often break the existing boundaries by establishing cooperative relationships with other industries in order to develop new services/products to meet the new needs from consumers and increase turnover. To save development time and cost, the cooperation between convenience store chains and other industries uses resources and knowledge sharing when developing new services. For example, convenience store chains cooperate across industries to develop new services (e.g. bill payment service, online shopping with pick-up at store service and multiple media kiosk service) hoping thereby to increase turnover and increase visits consumers, who already use their existing advantages (24-hour service, high density of store spread, robust information systems and professional distribution systems). Suppliers (e.g. IT system suppliers, logistics companies, service content companies) also contribute their resources and knowledge to new service developments.

In short, convenience store chains use both vertical and horizontal cooperation within their industry and across industries to develop wide ranges of goods and services with a view to improving existing operation procedures and reducing cost. They use IT systems to acquire, analyze and understand consumers' needs. Based on this

information, the convenience store chains can provide suggestions and valuable information to upstream suppliers who will then produce what will satisfy consumers' needs, such as fresh food for lunch and dinner, drinks and snacks. Some of the suppliers (e.g. IT system suppliers and logistics companies) also propose new technology and service procedure to convenience store chains in order to improve the existing cooperation (e.g. reducing cost and raising process efficiency).

The Taiwanese convenience store industry has developed over more than 20 years. So far, 10 different convenience store chains have grown up there. Four chains (Company E, Company F, Company H and Company O) dominantly occupy 95.51% of the market share. Table 5.1 shows the four main convenience store chains at the end of 2008, with their parent companies and the number of stores in each. Company E accounts for 52.15% of market share, followed by company F, occupying 25.25%, company H, with 13.43% of the market share and company O with 8.95% of market share. Company E and Company F cooperate with foreign companies by opening franchises in order to acquire the relevant knowledge and resources to establish new convenience store chains. Company E has acquired permanent licensing from a Japanese company using its brand name and developing different services locally at need. The product/service development of Company F is still highly influenced by its Japanese parent company, on the basis of its previous experience in Japan. Company H was established by a local Taiwanese company. Company O was also established by a local Taiwanese company which in order to set up the chain used a licensing contract to acquire the relevant knowledge and resources from a foreign company. However, the company became a local brand when it terminated its cooperative relationship with the foreign company in 2007.

Table 5.1: The introduction of the main four convenience store chains in Taiwan

Brand Name	Company E	Company F	Company H	Company O
Parent Company	President Chain Store Corp.	FamilyMart (Japan)	Kuang Chuan Group.	Feng Chun Group.
Main Shareholder (country)	President Chain Store Corp. (Taiwan)	FamilyMart (Japan), Taisun Enterprise Co.,Ltd. (Taiwan), ITOCHU Corporation (Japan), Kuang Chuan Group. (Taiwan)	Kuang Chuan Group. (Taiwan), Uni-President Enterprises Corp. (Taiwan)	Feng Chun Group. (Taiwan)
Number of Stores	4800	2324	1236	824

Source: Summarized by the author

Moreover, four convenience store chains (Companies E, F, H, and O) established different types of relationship with varying numbers of external actors (mainly cooperating with different suppliers) in the process of developing new services/products. Previous research suggests three types of openness, based on: 1) appropriability – different degrees of formal and informal protection; 2) the number of sources of external innovation; and 3) the formal and informal relationships with external actors by which the firms employing a closed or open business model can be investigated and characterized (Dahlander and Gann, 2007). The present research adopts the final type to clarify the different degree of openness adopted by four convenience store chains in the process of new service development. Company E often cooperates with some suppliers to develop strategic functions (e.g. IT systems and logistics) in developing new services. This company also manages their suppliers through different relationships (mainly by means of shared ownership and formal contracts), in order to save development time and cost. Moreover, Company F when it develops a new service also cooperates with suppliers in developing IT systems and logistical functions. Some suppliers are managed by shared ownership and long-term contracts. Companies E and F establish different degrees and types of relationship with greater degrees of openness than Companies H and O in developing new services. Companies H and O often develop different important functions internally. These four convenience store chains have been

selected in order to reveal how firms adopt inter-firm relationships and organizational routines with external firms in the development of selected services. Finally, the present study will make a cross-case comparison to identify the similarities and differences in the above issues.

5.4 The introduction of selected services

From the variety of products and services provided by Taiwanese convenience store chains, this research selects online shopping with pick-up at store service and multiple media kiosk (MMK) service to compare the similarities and differences in the research findings on the basis of different degrees of complexity and novelty. Convenience store chains demonstrate different ways of cooperating with different actors to develop these two services in the hope of increasing consumers' visits and the amount of turnover in each store. This section introduces the two selected services as follows.

5.4.1 The introduction of online shopping with pick-up at store service

Convenience store chains were given an opportunity to develop an electronic commerce service in Taiwan due to the issue of the trustworthiness of e-shops and the problem of customers' picking up what they had bought online. After they have placed their orders and paid for them online, consumers usually have to wait some time for an order to arrive via a home delivery service. Convenience store chains provide a 24-hour service to consumers and allow them to pick up their orders at any time. Alternatively, consumers can pay at the convenience store at the same time as they pick up their order. This advantage can solve the problem of trustworthiness of an e-shop for consumers who register payments online. Convenience store chains or agent companies (third party distribution companies) help consumers to filter the cooperative e-shops offering online services and make sure that these e-shops can carry out their contracts and provide a good quality service for their consumers (e.g. in terms of product quality and customer service). Convenience store chains which offer this service get extra value and increase consumers' visits. Convenience store chains do not need to invest much in creating an online shopping service but use their existing advantages (24-hour service, high density of stores and professional distribution systems) to play the "last mile" role in this service development.

This service was first set up by Company E in 2000, which formed a cross-functional team joined by two affiliated companies to develop this service. Company E authorized its affiliated company (Company P) to develop this service, following a period in which it was suspended. In order to integrate the service development and to compete with Company E, the other four convenience store chains (Companies F, H, O and N) established a joint venture (Company C) in 2000 to develop this service. In 2007, Company N was acquired by Company F. The main roles played by Companies P and C were to integrate the actors involved and to develop this service for their parent company's system. The actors in this service development were the convenience store chains (with a channelling role), Company P and Company C (a marketing and integrated role), logistics companies (including: third party distribution companies and self-owned distribution companies established by the various convenience store chains), IT system suppliers, applied IT system suppliers and e-shops (product providers). Convenience store chains allow their customers to choose a convenience store from which they can collect their orders and pay for them. The third party distribution companies can be seen as agents whose role is to invite more e-shops to join this service and to provide the e-shops with storage and delivery services. They help put things in order and deliver products to the distribution companies' convenience store chains. This is because each convenience store chain has its own distribution companies for delivering consumers' orders to convenience stores. When an e-shop chooses to join the service system of Companies F, H or O, it must sign a contract with one of the third party distribution companies and use that company's delivery service, unless the e-shops can deliver its goods directly to the distribution company owned by a convenience store chain. Companies F, H and O rely on third party distribution companies to sort consumers' orders by means of the convenience store chains' distribution network. The IT system suppliers are responsible for establishing and maintaining the IT framework of the service and for solving the connection problems with the various actors. In principle, e-shops sell their products online and respond to customers' enquiries about their orders.

After describing the task of each actor in this service, the chapter moves to the service operation procedure. When a consumer orders a product from an e-shop, it registers the order on what may be called the D day. Then the e-shop must deal with each order in the logistical flow, for which it has two processes. If it its own storage and delivery system,

it packs the product and directly delivers it to either the third party logistical system or the distribution systems of the convenience store. If it has no storage and delivery system of its own, it sends the information to a third party logistics company with which it cooperates. In this case, the third party logistics company deals with the order, for example, the barcode tag printed, packing the product and choosing a distribution system according to the delivery routes. The third party logistics deliver these orders to each convenience store by the afternoon of D day+1. Next, the distribution systems of the convenience store put the orders on the same delivery route together and deliver them to the stores. The consumers' orders always arrive at the store on the D day+2 and wait to be picked up by the consumer. If consumer has not picked up his/her order by D day+9, the order is sent back along the distribution systems of the convenience store, followed by either a third party logistics company or an e-shop. Consumers can choose to pay for their completed orders online, for example by credit card and ATM transfer, or at the convenience store in cash. If consumers choose the latter, the convenience stores accounts for all payments, however much money they have collected, and every month pay a fixed percentage of the price to the integrators of the two service system providers (a group company of Company E and Company C). The integrators dispense the rest of money in agreed percentages of the price to the other actors. Before the distribution systems of the chain of convenience stores send the consumers' orders to each store, the head office of the chain receives the information about these orders and separates them to send to the different stores concerned so as to confirm when the distribution system sends out the consumers' order to each store. The logistical flow of this service is shown in Figure 5.1.

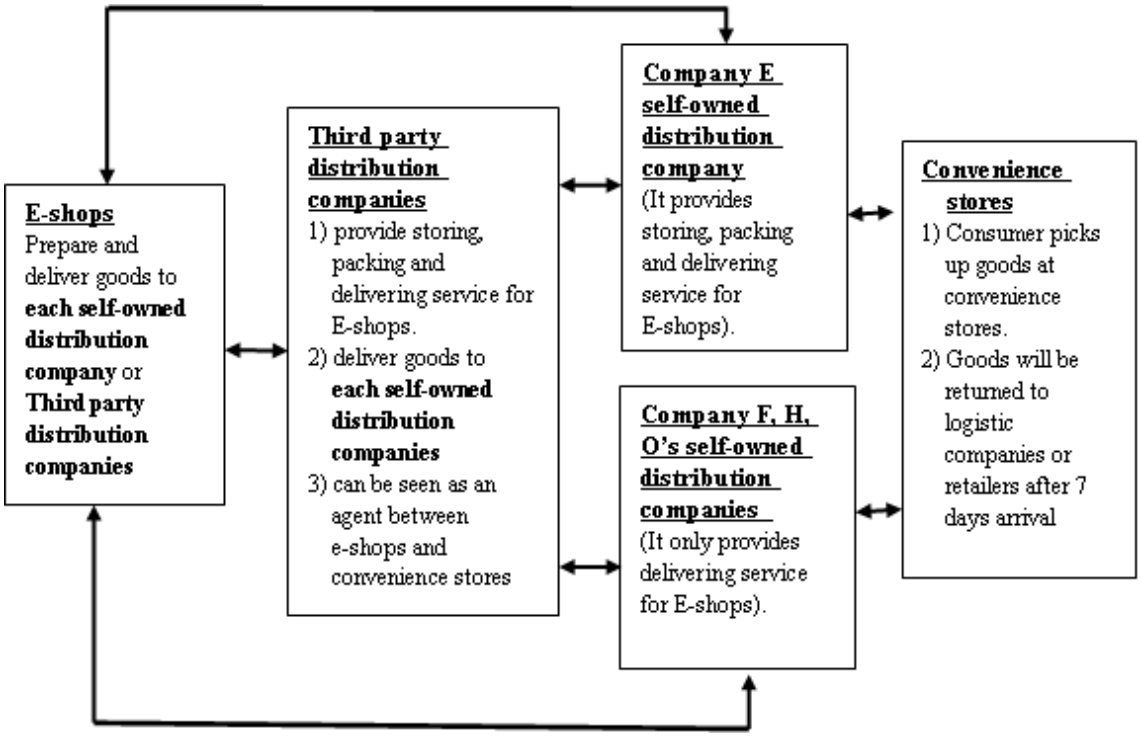

Figure 5.1: The logistic flow of the Online shopping with pick-up at store service
Source: Summarized by the author

5.4.2 The introduction of multiple media kiosk (MMK) service

The combination of physical place and virtual product/service operates in Taiwanese convenience store chains, for such facilities as bill payment services, the spending of collected points, online games credits and ticket sales for package tours, concerts and musicals, etc. The companies (e.g. banks, online game companies, telecoms, water, electricity and gas suppliers) cooperate with the convenience store chains and use the stores' high density to sell their products/services and collect payments. Convenience store chains provide these services to increase the frequency of consumers' visits and store turnover. This service relies on the robust information system of convenience store chains (composed of their POS systems), differentiating between services by scanning different barcodes. Recently, convenience store chains have integrated these services and other web-based ones in kiosks connected to different service content companies and have placed a kiosk in each convenience store. This service provides a new user interface for web-based service providers to sell their service contents and, in their turn, increase turnover. Consumers can select different services (web-based and catalogue services) at the kiosk and print out a bill for themselves to pay at the cashiers' desk. Previously, consumers had to memorise and tell store staff the name of the product or

the amount of credit they wanted. The store staff had then to find the name of the product in the catalogue and scan the barcode in order to collect the payment. The provision of this service in the convenience store chains can save the cost of printing and updating the catalogue, be flexible in dealing with different packages, increase the profit margin and reduce staff workload. The development of multiple media kiosk services involved several actors: a service developer (marketing and administration), an IT system supplier, a hardware manufacturing company and service content companies. This service is still being developed and cooperates with many external, cross-industrial companies, in order to enrich its service content and increase profit. The service content includes not only the existing services listed above, but also web-based services (e.g. mobile ringtone download and online fortune-telling).

Based on the above illustration of the multiple media kiosk services, we can find that this service development also involves different actors, such as service content companies, hardware and software companies and convenience store chains. The convenience store chains provide a place to put the hardware and collect the payment from consumers. The hardware company develops the kiosk for service use. The software supplier develops the information platform and makes sure the different actors can successfully access and connect to the service platform. The company also provides specifications to teach online service providers how to connect this system and design its content pages. The service content companies provide their existing contents with this system and develop user pages for step-by-step consumer purchasing.

This service was developed by each convenience store system individually. Company H first developed it in 2003 and successfully transformed some specific service contents at the kiosk (e.g. facilities for spending collected points and ticket sales for concerts, operas and musicals, etc.). Within the past 3 years, Company E has authorized its affiliated company to develop this service. Company F used a cross-functional team to develop this service for itself. External companies co-developed this service and cooperated with Company O in a specific region (60 stores) to test it. Unfortunately, this cooperation was suspended two years ago because of too few services were offered and inter-organizational integration was poor.

Having described the contribution of each actor in this service, the section turns to the

operation of the service itself. Consumers at the kiosk can choose any service product they want, then print out the details on paper and make a payment at the cash desk. The details include the product's name, price and an identifying barcode which is used for making the actual payment. The printed paper also can be used as an admission ticket for baseball games, concerts and musicals. Once the consumer has made a payment the information system can also directly connect to the correct service content company and request the consumer for a password to an online service.

With regard to the introduction of the two selected services, the present research found that both belong to the dimension of new service delivery /customer interface, which stems from Forfáss' (2006) non-technological classification of service innovations. The online shopping with pick-up at store service provides consumers with a new service delivery system. The multiple media kiosk service provides consumers with a new client interface from which to purchase service contents. The developments of selected services also involve the technological dimension of service innovation, such as providing an interface which integrates different IT systems and installs the new hardware. Although the two selected service developments belong to the same dimension of service innovation, the present study further found that both involve different degrees of complexity and novelty in the process of developing new services development. The online shopping with pick-up at store service mainly uses the existing distribution system and IT systems of convenience store chains and integrates from external firms a different IT system, which transfers information. This service development integrates different functional actors (namely, convenience store chains, IT system suppliers, self-owned distribution companies, third party distribution companies and e-shops) to contribute this service development and provide consumers with another way to collect their orders from e-shops. In this service development the degree of complexity is higher.

Unlike the development of the online shopping with pick-up at store service, the process of developing the MMK service involved the convenience store chains in developing an IT platform and hardware and connecting it with an existing IT system (e.g. the POS system). This service development mainly focuses on connecting convenience store chains and service content companies by an IT system for transferring information. In order to enrich the service content of the kiosk, convenience store chains have to invite

different service content companies (e.g. web-based and catalogue shopping service content companies) to join this service and connect the two IT systems. This service also integrates existing services (e.g. for bill payments and ticket sales) and transforms them in the kiosk. The degree of novelty is higher in this development. The present research selects these two services to consider their similarities and differences on the basis of the theoretical framework (Figure 3.3).

5.5 Summary

The main focus of this chapter was to identify the sources of innovation and linkage interaction between convenience store chains and their partners in the Taiwanese convenience store industry. This research found that suppliers and convenience store chains are the main sources of innovation. Convenience store chains often propose new service developments on the basis of consumers' demand collected from IT systems in order to improve their existing operation procedures and satisfy this demand. Moreover, suppliers (in particular IT system suppliers and logistic companies) also adopt new technology or service procedures to improve the efficiency of existing operation processes and reduce operation costs. This research also found that convenience store chains establish cooperative relationships with different actors in the process of developing new services. These actors provide valuable resources/knowledge and develop new services by combining what they have provided with the existing advantages of convenience store chains. Finally, this research found that two selected service developments belong to the dimension of new service delivery/client interface and are associated with the technological dimension. These service developments have different degrees of complexity and novelty and their similarities and differences can be illustrated in the theoretical framework developed in Chapter 3.

Chapter 6: Discussion of the empirical findings – Intensity of inter-firm collaboration

6.1 Introduction

As stated in Chapter 3, the present research is concerned with the way in which firms use different types and degrees of inter-firm relationship with their partners in the process of developing new services and the way in which this issue is associated with the speed of this development. The current chapter aims to identify how the intensity of inter-firm collaboration varies across four cases (Companies E, F, H and O) and two selected services (the online shopping with pick-up at store service and the multiple media kiosk service). Moreover, the influence of this intensity on the speed of developing new services will be addressed and then compared in the two selected services. The present chapter is organized as follows: First, sections 6.2 and 6.3 describe and compare how Taiwanese convenience store chains exhibit different degrees of intensity in their inter-firm collaboration with their suppliers in developing two selected services. Cross-case comparison between two selected services in the above matter will be discussed in section 6.4. Second, section 6.5 investigates and compares how different intensities of inter-firm collaboration influence the speed of developing new services in different types of new service.

Fliess and Becker (2006) developed taxonomy of the intensity of inter-firm collaboration between firms, including internal development, licensing, contractual development, coordinated development, joint development and contractual joint ventures in developing new products. These different forms of inter-firm cooperation can be classified by the different levels of responsibility between customer and suppliers in developing a new product. For example, coordinated development can be divided into three forms of cooperation: asymmetrical cooperation, black-box cooperation and systems partnership on the basis of the different levels of detailed instruction or module is done by customer. In addition, Petersen et al. (2005) also define different levels of supplier integration, including: no supplier involvement, white box cooperation, gray box cooperation and black box cooperation. This classification provides clearer distinctions in the responsibility for specification design and the associated decision making between firms in developing new products.

The present research adopts the classification of intensity of cooperation based on Fliess and Becker's (2006) research and incorporates the classification of coordinated development from Petersen et al. (2005). The most important forms of inter-firm cooperation are contract development, coordinated development and joint development. Coordinated development can be further divided into five types: asymmetrical cooperation, white-box cooperation, grey-box cooperation, black-box cooperation and systems partnership on the basis of different levels of responsibility in specification design and associated with the decision making process between convenience store chains and suppliers in the process of developing new services. The different degrees of intensity of inter-firm collaboration are defined by indicating the different responsibilities of the supplier in the specification design associated with the decision making process in Table 6.1. This can be used to clarify the different degrees of intensity of cooperation between the convenience store chains and their suppliers in the two selected service developments.

Regarding the assessment of the speed of developing new services, the present research adopted the definition of speed of developing new services from the research of Voss et al. (1992). Their research provided an integrated measurement of the development of new services and separated different measurements into outcome perspective and process perspective. The measurements of outcome perspective include financial measures, competitiveness measures and quality measures. The measurements of process perspective include criterion cost, effectiveness and speed. Some measurements can be applied to measure the speed of developing new services, including: time between concept and service launch, from concept to prototype, from prototype to launch and the time taken to adopt a new concept from outside the firm. Since Taiwanese convenience store chains often tell consumers about the launch time of a service in order to attract their patronage, it is easier to calculate the time spent between concept and service launch and this makes it easier to identify and measure the speed of developing new services in the accounts given by interviewees.

According to the above discussion regarding the definitions of different degrees of /intensity of inter-firm collaboration and the speed of developing new services, this section first identifies the different degrees of intensity in inter-firm collaboration between convenience store chains and their partners/suppliers in two selected service

developments. The different responsibilities owned by the convenience store chains and their partners/suppliers in the process of developing new services are analyzed to identify the different levels of intensity of inter-firm collaboration. The development of the online shopping with pick-up at store service in four case companies was analyzed first and of the multiple media kiosk service next.

Table 6.1: The definition of different degrees of intensity in inter-firm collaboration

Intensity of inter-firm collaboration			
Low	**Contract development**	Customer and supplier based, with a contract to define the objects, tasks and restrictions between them. Supplier performs development activities separately from the customer.	
	Coordinated development	***Asymmetrical cooperation***	Customers directly provide detailed specification or instruction to suppliers for developing the final product/service.
		White-box cooperation	Customers informally discuss with suppliers the specifications and then make their own decisions about specifications.
		Grey-box cooperation	Customers and suppliers share relevant information/knowledge and then make decisions together about the design specifications
		Black-box cooperation	Suppliers take almost all responsibility for developing modules for the final product. Customers make known their requirements only and review the design specifications.
High		***Systems partnership***	Suppliers develop the complex part of the final product/service and integrate the pre-suppliers in the development process.
	Joint development	Customers and suppliers regularly form a project team involved in the development activities.	

Source: Classification integrated from Fliess and Becker (2006) and Petersen et al. (2005)

6.2 The intensity of inter-firm collaboration in developing the online shopping with pick-up at store service

First, this section describes the responsibility of each actor and identifies the different levels of intensity of inter-firm collaboration between convenience store chains and their suppliers in developing online shopping with pick-up at store service. The four convenience store chains in Taiwan split up two groups to develop this service. To do so, Company E initially formed a project team with its affiliated companies. Company E finally authorized its affiliated company to take the main role in developing this service

and coordinating with the other affiliated companies owned by Company E. The other convenience store chains formed a joint venture to develop this service and cooperated with external firms (e.g. a third party distribution company and an IT system supplier) in developing important functions (e.g. logistics and IT functions).

6.2.1 Company E

In the first stage, Company E initially formed a project team with its affiliated companies (one IT system supplier and one logistic company) to work together in the same office. This team involved staff from Company E's marketing staff (marketing function), financial staff (financial function), bill payment service staff (platform provider) and staff from group companies, one from an IT system supplier (IT function) and one from a logistic company (logistics function). Figure 6.1 shows the responsibilities of Company E and its co-operators in the first stage. This diagram also shows the different levels of intensity of inter-firm collaboration between Company E and its suppliers.

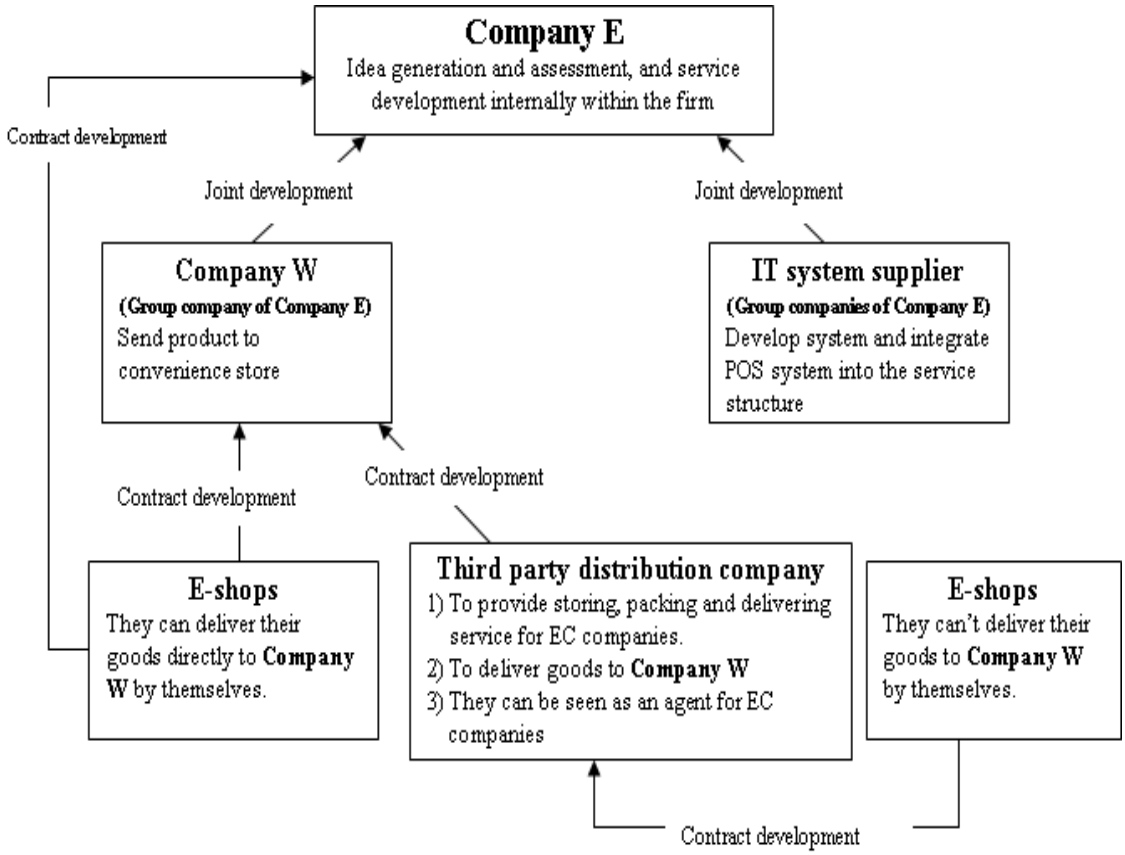

Figure 6.1: The intensity of inter-firm collaboration between Company E and its suppliers in the first stage
Source: Summarized by the author

Company E used joint development with its affiliated companies (a logistic company and an IT system supplier) to develop IT and logistical functions to support this service development. These affiliated companies developed functional specifications and discussed with other team members in order to integrate and connect the different systems (e.g. the logistical, financial and IT systems). Company E and its logistic company signed a service contract with the e-shops and provided them with a delivery service and a pick-up at convenience store service. The former manager of the logistic company said:

> "*Company E introduced a service framework with e-shops and discussed contract terms. Then our company signed a service contact with the e-shops and Company E and provided a packing, storage and distribution service to the e-shops.*"

The former manager of the IT system supplier also said:

> "*Our company was first one of the departments in Company E when we developed this service in the first stage. Then our company split off from Company E during this service development. Our company developed the IT platform for information exchange, taught the e-shops how to connect to the platform and maintained the platform. Our company had to provide the specification and test the system connection with the e-shops.*"

In the first stage, moreover, Company E used contract development with a third party distribution company. The third party distribution company provided storage, packing and delivery services for e-shops and delivered consumers' orders to the distribution company owned by Company E if the e-shops could not deliver the goods to Company E's distribution company and also provided specifications to the third party distribution company in order to connect the two IT systems for data transfer.

Due to concerns over service capacity and the security of the goods, Company E closed down this service for a while, but finally authorized its group company – Company P – to continue to develop it in the second stage and provided it with marketing support. Company E played a key role in coordinating the cooperation between the group companies (Company P, the IT service providers and the logistic company) and providing control over the quality and progress of the service development in the second stage. Figure 6.2 shows the responsibility of each actor and the intensity of inter-firm collaboration between Company E and its suppliers in the second stage.

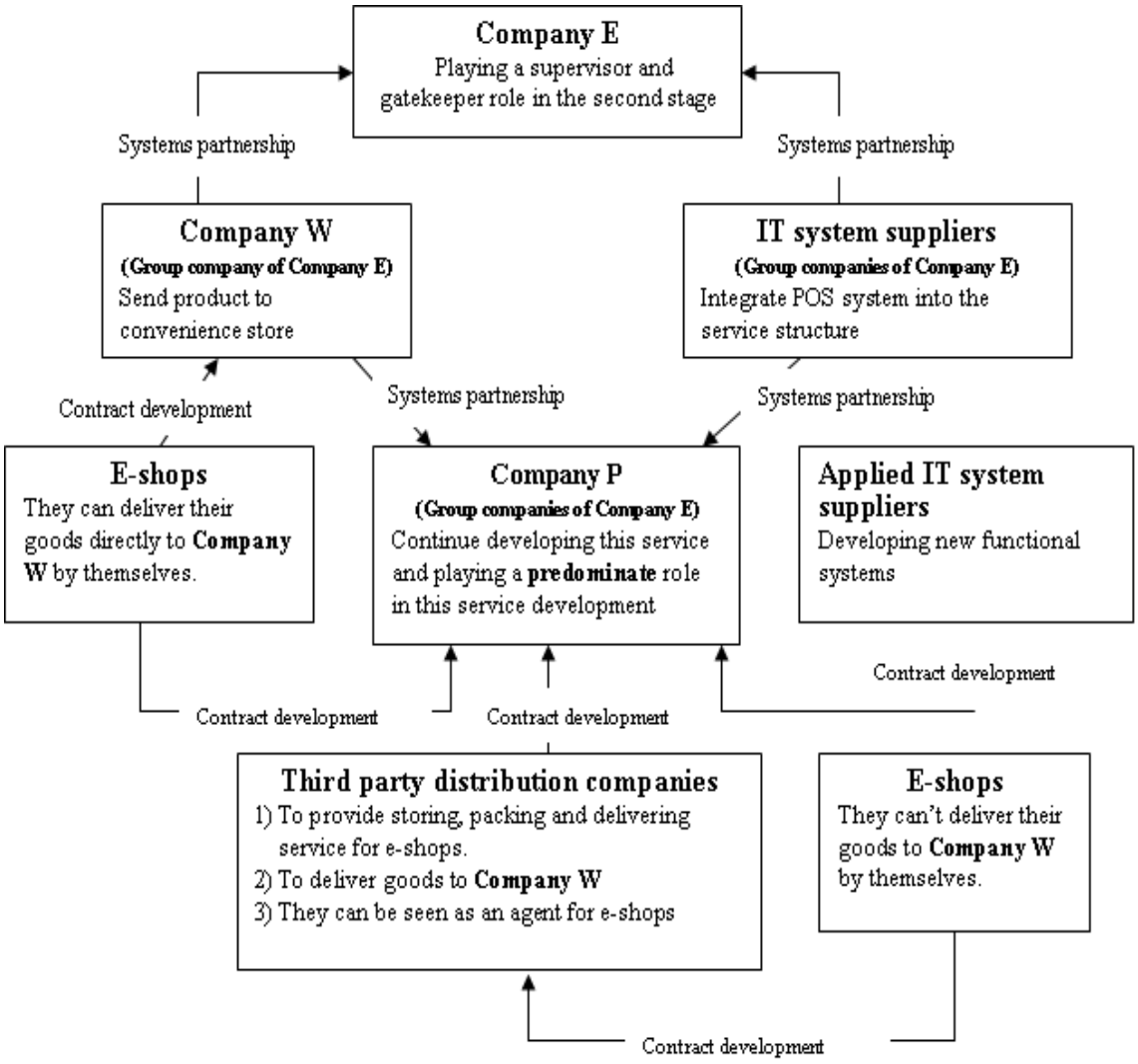

Figure 6.2: The intensity of inter-firm collaboration between Company E and its suppliers in the second stage
Source: Summarized by the author

Company P discussed the requirements for new projects with Company E and came to a decision. Then Company P went on to discuss with Company E's IT system supplier the specifications and requirements of new projects in order to fit the existing internal IT system of Company E. The marketing manager from Company P said:

> *"Our company can be seen as a general agent in this service. We always discuss new ideas together, no matter whether the idea was generated by our company or Company E. After we decided to develop the new idea, our company began to look for potential partners and establish a cooperative relationship with them. Then we worked together with Company E's IT system supplier and Company E, which can be seen as a three-sided cooperative relationship. Our company is a marketing team in this service structure."*

In addition, Company P used contract development with the relevant IT system

suppliers to develop some functional systems. This was because the IT system of the service was separated into a main IT system (the convenience store's internal system, such as the POS system) and functional systems. In order to ensure that the main IT system operated normally, the IT system suppliers of Company E provided only an interface for connecting different e-commerce services. Company P cooperated in the second stage with some relevant IT service suppliers of similar capacity to develop some functional systems. In this stage, Company P also used contract development with e-shops. It invited e-shops to join this service and signed a service contract with them. The service requirements and specifications to connect the two IT systems were provided by Company P.

Finally, Company P cooperated with the third party distribution companies by contract development in this stage. Company P provided them with the specifications to connect IT systems and transfer logistical information. Third party distribution companies also helped to invite e-shops to join this service and provided them with storage, packing and delivery services if the e-shops could not deliver the goods to Company E's distribution company.

6.2.2 Companies F, H and O

In 2000, four convenience store chains (Companies F, H, O and N) formed a joint venture (Company C) to develop online shopping with a pick-up at store service. Although Company N had been acquired by Company F in 2007, its parent company still held 25 percent of the shares in Company C. Company E had about 50 percent of market share in Taiwan. If Companies F, H, O and N had developed this service individually, they would not have had enough bargaining power to negotiate with the e-shops. They used Company C to buy goods in order to reduce purchasing costs (joint purchasing). Companies F, H, O and N were able to influence the direction of this service development through board meetings. In the first stage, the general managers of these four companies met once a month to decide development plans.

At this time, there was only one third party company to deliver the goods from the e-shops to each convenience store. Each actor had to connect separately to the other actors' IT systems. Figure 6.3 shows the responsibility in the first stage of each actor and the intensity of inter-firm collaboration between Companies F, H and O and its

co-operators. As Figure 6.3 shows, the four convenience store systems organized a joint development with Company C by using joint decision making and problem-solving to develop this service. The former manager of Company C said:

> "*These convenience store chains formed a joint venture (Company C) to develop this service. Each convenience store assigned a person to execute different tasks in Company C. Company C has representatives of all the convenience stores that operate this service – the technology, contract and logistics also can be unified. The benefit is that this group (Companies F, H, O and N) is on the same scale (store amounts) to compete with Company E and negotiate with suppliers …Company C initially used joint purchasing and the sales of own brand products to support itself. Being based on the profit model, this company began to develop the online shopping with pick-up at store service.*

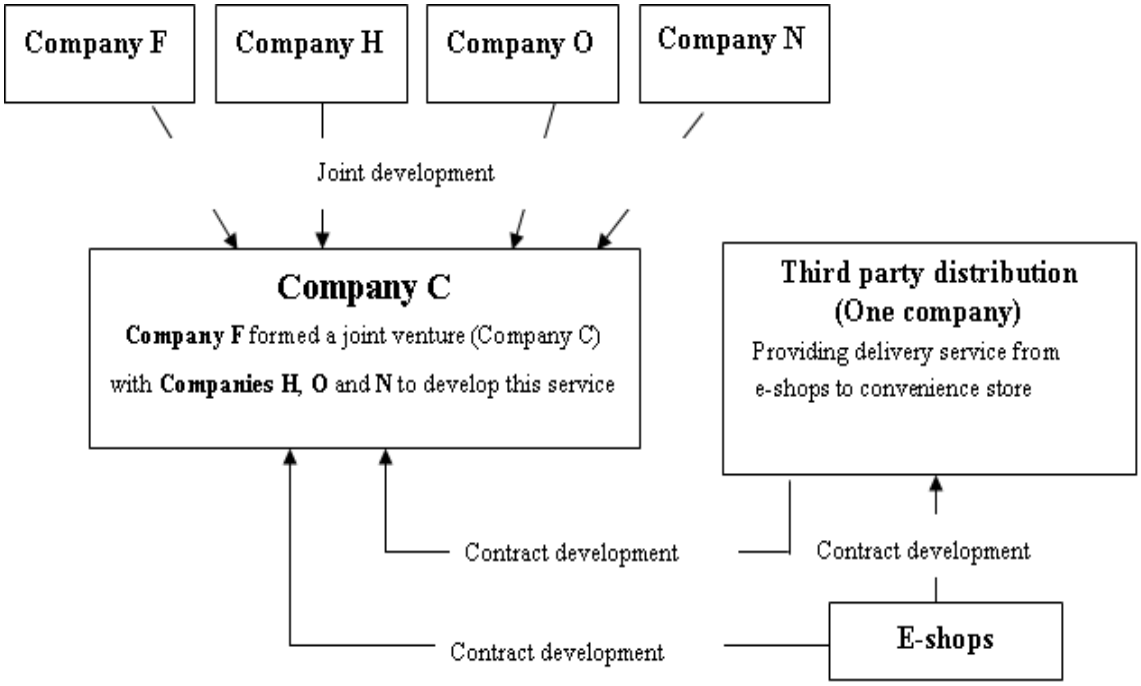

Figure 6.3: The intensity of inter-firm collaboration between Company F, H, O and N and their suppliers in the first stage
Source: Summarized by the author

Company C simply signed service contracts in the first stage with a third party distribution company and e-shops. Company C also clarified its operation procedures and requirements for them so that they could develop and execute this service. The third party distribution company delivered goods directly from the e-shops to the stores of Companies F, H, O and N.

After this service structure had operated for two months, this service was suspended because certain problems arose, in such areas as information transfer between actors and

the delivery capacity of the third party distribution company. Company C developed contracts with a new third party distribution company. This third party distribution company helped this group (Companies F, H, O and N) to deliver the goods from the e-shops to either the distribution company owned by Company H or the stores of Companies F, O and N. The former manager of Company C said:

> "*The service was suspended for two months due to the service capacity of the third party distribution company and information transfer among different actors. A new third party distribution company was invited to cooperate with the IT department of Company F in order to unify the formats and requirements of data transfer among the different actors. The third party distribution company also helped our company to deliver goods to either the distribution company owned by Company H or the stores of Companies F, O and N.*"

In the second stage, a distribution company owned by Company H joined this service development, using its existing delivery routine. The distribution company was set up by Company H and delivered goods to the stores of Company H. E-shops signed service contracts (contract development) with Company C and the logistical companies (a third party distribution company or a distribution company owned by Company H). Company C and logistic companies provided operation procedure and specification to e-shops in the second stage in order to connect the two IT systems. Figure 6.4 shows the responsibility of each actor and the intensity of the inter-firm collaboration in the second stage between Companies F, H, O and N and their suppliers.

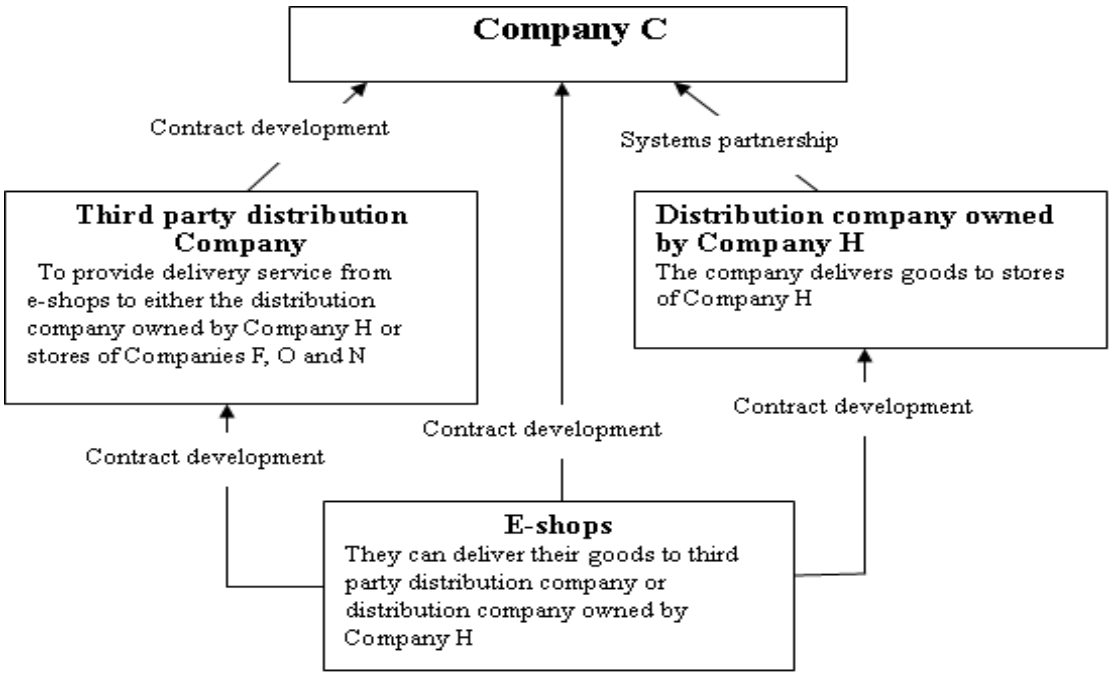

Figure 6.4: The intensity of inter-firm collaboration between Companies F, H, O and N and their suppliers in the second stage

Source: Summarized by the author

In the third stage, after this service structure had operated for some time, it underwent further changes. The third party distribution company stopped providing a delivery service from the e-shops to the distribution companies which provided the delivery service to the convenience store chains. Company C developed contracts with another third party distribution company to provide a delivery service and to transport goods from e-shops to the distribution company of each convenience store chain. However, the previous third party distribution company (in the second stage) still delivered goods to Company F and finally was acquired by Company F. Company C invited an experienced IT system supplier to develop an IT platform and format for exchanging information between the actors (e.g. the convenience store chains, the third party distribution companies and the e-shops). As the former manager of the IT system supplier commented:

> "*Our company developed a platform and defined the formats of data transfer in order to exchange information among the different actors involved (e.g. e-shops, the third party distribution company, the convenience store chains, the distribution company of the convenience store chain and Company C). We opened a new account for a new entrant and gave it the rights and specifications to use this platform. Our company developed this platform for Company C in order to manage the information flow between all different actors.*"

The IT system supplier also invited an e-map software supplier to co-develop an e-map system for the development of the online shopping with pick-up at store service. The cooperation between the IT system supplier and Company C can be characterized as coordinated development (systems partnership) because the IT system supplier took full responsibility for developing this IT system and integrated its sub-system development. Figure 6.5 shows the responsibility borne by each actor and the intensity of inter-firm collaboration between Companies F, H, O and N and their suppliers in the third stage.

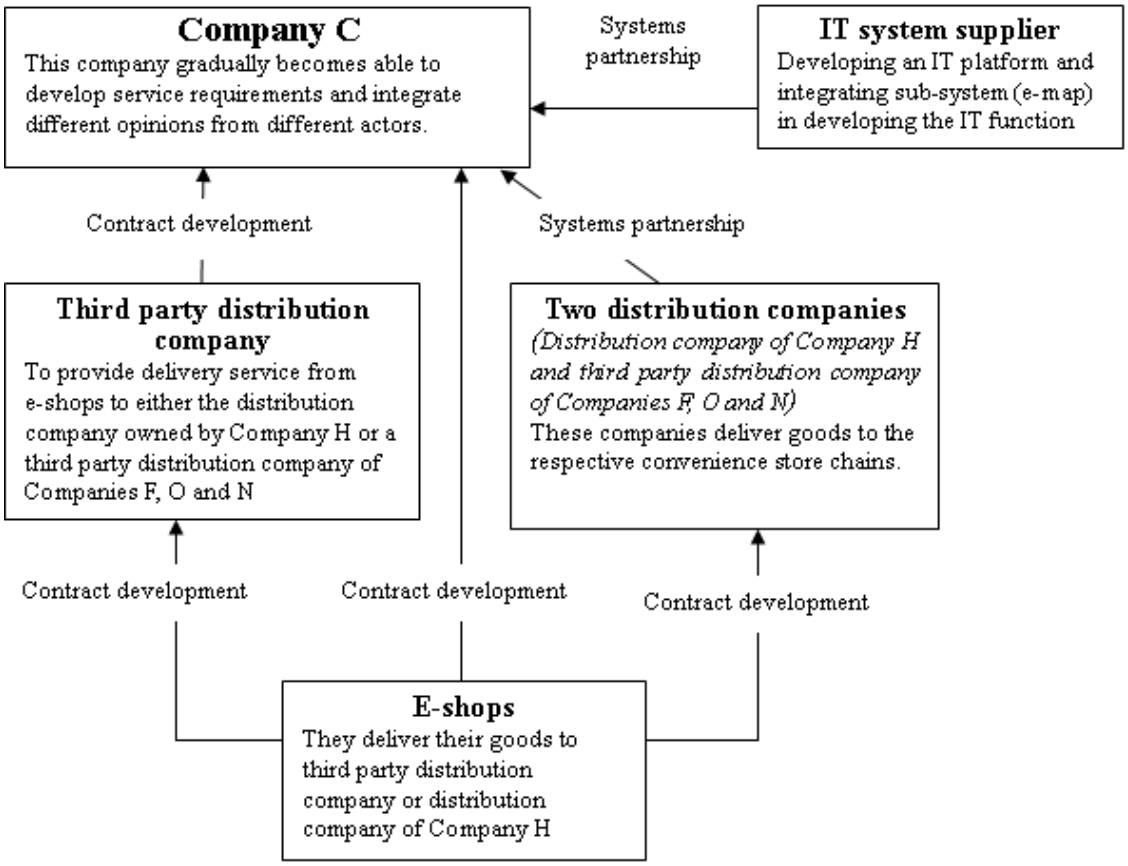

Figure 6.5: The intensity of inter-firm collaboration between Companies F, H, O and N and their suppliers in the third stage
Source: Summarized by the author

Currently, the main roles played by Company C include specifying the requirements of this service and integrating any suggestions from the convenience store chains, the IT system supplier and the third party distribution companies. The former manager of Company C said:

> "*Company C now has the capacity to provide the project requirements in the IT system development. The IT system supplier offered its suggestions and confirmed the requirements of Company C …Company C also use three third party logistic companies now to deliver consumers' orders from the e-shops to the respective distribution companies of convenience store chains. These third party logistic companies also functioned as agents, who invited the e-shops join this service and signed service contracts with them.*"

Company C, then, developed contracts with third party distribution companies. Third party distribution companies provided storage, packing and delivery service for the e-shops and delivered consumers' orders to the distribution companies owned by the convenience store chains. They also served as agents for Company C inviting e-shops to sign contracts with them if the e-shops could not deliver the goods to each convenience

store chain's distribution company. A manager from a third party logistical company detailed its responsibilities with this service:

> *"Our company provided e-shop companies with storage, packing and delivery services and signed contracts with them. We also delivered consumers' orders to different logistical systems belonging to the respective convenience store chains."*

The other manager from third party logistics also stated:

> *"Our company has responsibility to promote this service to e-shop companies. We signed agent contracts with Company C and Company P. Our company also signed logistical contracts with e-shops, the contract terms (e.g. arrival time and day of request payment) being based on our contract with Company C and Company P."*

The cooperation between Company C and the distribution companies owned by Companies H and F is on the basis of coordinated development (systems partnership). This is because these distribution companies integrated the pre-suppliers (i.e. the different goods which came from different suppliers) and delivered the goods to the various convenience store chains. The cooperation between Company C and the IT system supplier is based on coordinated development (systems partnership) because the IT system supplier has helped Company C to develop an IT system for transferring the logistical flow between the different actors (e.g. the convenience store chains, third party distribution companies, the distribution companies of convenience store chains and the e-shops) and to integrate a sub-system supplier (e.g. e-map system supplier).

The e-shops can sign service contracts with either Company C or one of the third party distribution companies on the basis of the difference between the capacities of the e-shops. If the e-shops can directly deliver goods to the respective distribution companies belonging to the convenience store chains, they can directly sign a service contract with Company C. Moreover, e-shops can also sign service contracts with one of the third party distribution companies if they cannot directly deliver goods to the distribution companies of the convenience store chains. Service operation procedures and specification are provided by Company C or distribution companies owned by the convenience store chains. The responsibility of each actor and the intensity of inter-firm collaboration between Companies F, H and O and their suppliers in the fourth stage are shown in Figure 6.6.

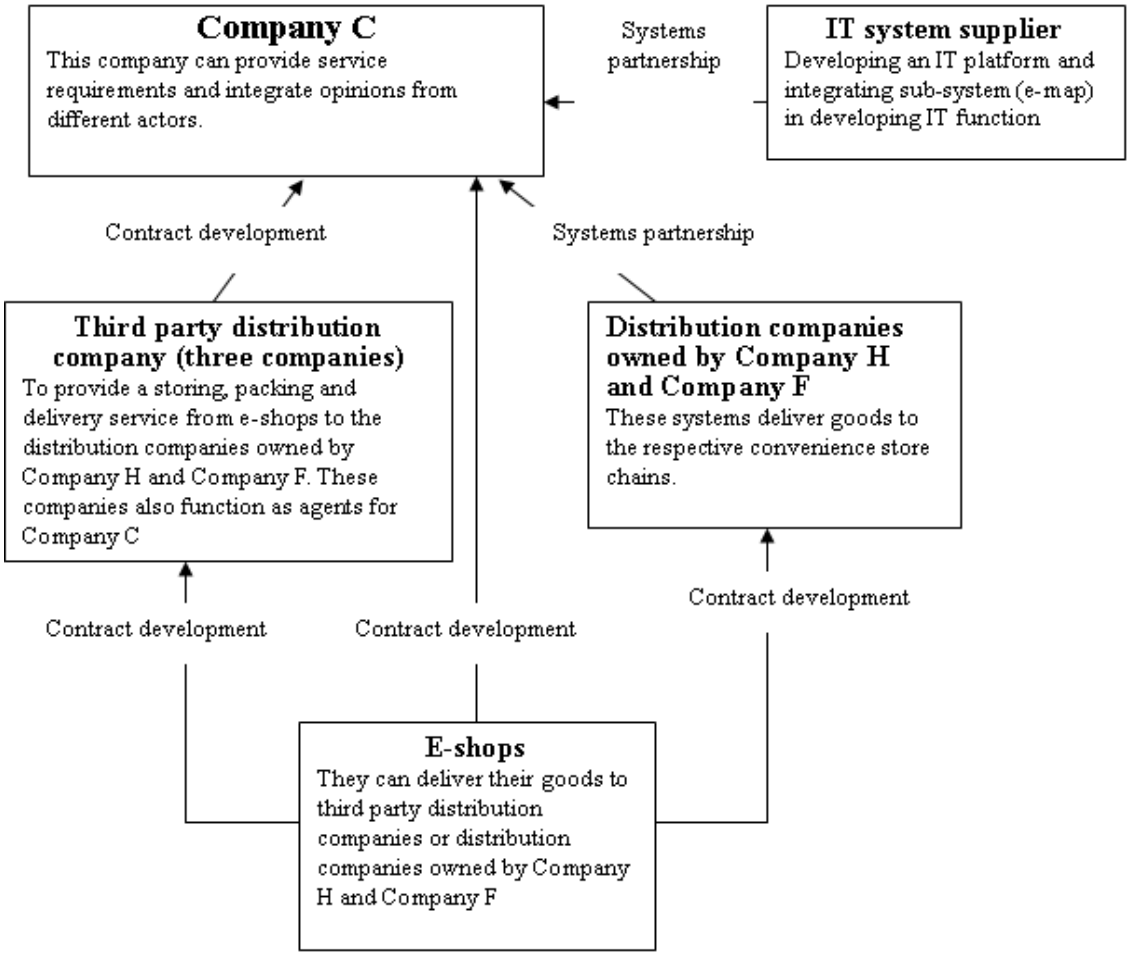

Figure 6.6: The intensity of inter-firm collaboration between Companies F, H and O and their suppliers firms in the fourth stage
Source: Summarized by the author

6.2.3 Cross-case comparison between two groups of the intensity of inter-firm collaboration

The four convenience store chains played different roles in developing the online shopping with pick-up at store service. In the first stage, Company E originally used joint development with its affiliated companies (a logistic company and an IT system supplier) and formed a project team Due to concerns over service capacity and the security of the goods, Company E finally authorized its group company – Company P – to continue to develop it in the second stage and provided marketing support after this service was temporarily closed. Company E played a key role in coordinating the cooperation between the group companies (Company P, the IT service provider and the logistic company) and in controlling the quality and progress of the service development in the second stage. Unlike Company E, the other convenience store chains (Companies F, H, O and N) used joint development to establish a new

company – Company C – to develop this service for them. They also used Company C to buy some goods on their behalf in order to reduce purchasing costs (joint purchasing).

As regards the IT system supplier, Company E used coordinated development (systems partnership) with its group companies and involved the applied IT system suppliers by using contract development to develop some functional systems in the second stage. This was because the IT system of the service was split into a main IT system (the convenience store's internal system, for example a POS system) and functional systems, since Company E had to ensure that the main IT system operated normally. Unlike Company E, the actors of the other group (i.e. the convenience store chains, third party distribution company, e-shops) who were involved in the first stage in this service development connected individually with the IT systems of the other actors. Next, the requirements and format of the information transfer were decided and integrated by Company F's IT department and its third party distribution company (grey-box cooperation) in the second stage. Finally, this group used coordinated development (systems partnership) with an external firm to develop the IT system for integrating the information flow between the different actors.

The development of the logistic function can be separated into two routines. The third party distribution companies provided storage, packing and delivery services for the e-shops and delivered consumers' orders to the distribution companies owned by the convenience store chains if the e-shops themselves could not deliver the goods to the distribution company of each chain. The distribution companies owned by convenience store chains delivered the consumers' orders to the various convenience stores. In the first stage Company E began by using joint development with its own logistics to deliver the goods to each store. It also engaged in contract development with a third-party distribution company. When Company E authorized Company P to develop this service, it used coordinated development (systems partnership) with its own logistics in developing the logistical function. The other group in the first stage used contract development with a third-party distribution company. The third-party distribution company delivered the goods direct to the stores of Companies F, H, O and N. Given the service capacity of the third-party distribution company, this group invited a new third-party distribution company in the second stage using contract development

and delivering consumers' orders either direct to the distribution company owned by Company H or to the stores of Companies F and O. In the third stage, the third party distribution company no longer provided a delivery service from the e-shops to the distribution companies owned by Company H. This group invited another third party distribution company (by contract development) to provide a delivery service and to transport goods from the e-shops to the distribution company of each chain. However, the previous third party distribution company (in the second stage) still delivered goods to Company F, which finally acquired it, and it became a self-owned distribution company. Third party distribution companies cooperated with this group by using contract development. Both of them (Company E and Companies F, H and O) developed by contracts with e-shops. Table 6.2 summarises a cross-case comparison between different companies in the development of the online shopping with pick-up at store service.

Table 6.2: Cross-case comparison of the different degrees of intensity in the inter-firm collaboration between two groups in developing the service of online shopping with pick-up at store

	Company E	**Companies F, H and O**
Service developer	1. Company E formed a project team with affiliated companies in the first stage. 2. Company P was authorized to develop this service in the second stage (systems partnership).	1. Convenience store chains used joint development with Company C in decision-making in the first stage. 2. This new company (Company C) grew in prominence as it developed this service in the second stage.
IT system supplier	1. Joint development with an IT system supplier in the first stage. 2. Coordinated development with affiliated companies (systems partnership) in the second stage. 3. Involving applied IT system suppliers to develop different functional systems by using contract development in the second stage.	1. The IT specification was initially developed by Company F and its cooperative distribution company (grey-box cooperation) in the second stage. 2. Coordinated development (systems partnership) with an external company to set up an integrated IT system in the third stage.

Logistics	1. Joint development with a self-owned distribution company in the first stage. 2. Coordinated development (systems partnership) with a self-owned distribution company in the second stage. 3. Contract development with third party distribution companies.	1. Coordinated development (systems partnership) with self-owned distribution companies. Companies F and O strengthened the intensity of the inter-firm collaboration from contract development to coordinated development (systems partnership) in different stages of the development. 2. Contract development with third party distribution companies.
E-shop	Contract development	Contract development

Source: Summarized by the author

6.3 The intensity of inter-firm collaboration in developing the multiple media kiosk (MMK) service

Having discussed the responsibility of each actor and the intensity of inter-firm collaboration in the online shopping with pick-up at store service, the chapter in the following section describes the same issue in terms of the multiple media kiosk (MMK) service development. Four convenience store chains individually cooperated with different actors (the IT system supplier, hardware manufacturing company and service content company) in developing this service. Company E authorized its affiliated company (Company Q) to lead and coordinate different affiliated companies (IT system suppliers) in developing this service. Company Q also cooperated with a hardware manufacturing company and service content companies in order to acquire the essential resources (i.e. hardware and service content). Company F used a cross-functional team within its company and cooperated with different actors (i.e. a IT system supplier, hardware manufacturing company and service content company) in developing this service. Company H also used a cross-functional team within its company and cooperated with a hardware manufacturing company and service content company for this service development. In contrast, Company O played only a channel role in this development. The IT system suppliers and a hardware manufacturing company formed a team and cooperated with Company O to develop this service. The following section identifies the responsibility of each actor and the different degrees of intensity in the

inter-firm collaboration adopted by four convenience store chains to develop the multiple media kiosk service.

6.3.1 Company E

Company E did much research in this service development and carefully considered the timing of the start-up. This company conducted a survey and generated ideas in the process of developing new services. After Company H had successful developed this MMK service and attracted consumers to its use, Company E authorized its group company (Company Q) to lead and co-develop this service with other companies in its group (two IT system suppliers in different domains). Company E used coordinated development (systems partnership) with its group companies, Company Q and the two IT system suppliers, in developing this service. These affiliated companies integrated different pre-suppliers and sub-systems in developing different functions (e.g. its marketing and IT functions). Accordingly, Company E became a coordinator which integrated affiliated companies and provided suggestions and feedbacks to Company Q. It also supervised the design quality of the client interface with Company Q and the service content companies. Company Q played a key role in creating different business modules and cooperating with different service content companies in order to enrich the variety of the service and increase the turnover in its development. It also discussed with the hardware manufacturing company in the specification of hardware. Figure 6.7 shows the responsibilities of Company E and its suppliers in this service development. This diagram also shows the intensity of inter-firm collaboration between Company E and its suppliers.

The cooperation between the hardware manufacturing company and Company E was on the basis of coordinated development (grey-box cooperation). Then Company E authorized Company Q (an affiliated company of Company E) to develop this service and discuss its hardware requirements with the hardware manufacturing company. The hardware manufacturing company also provided suggestions in developing its hardware specifications, produced the hardware, and provided a parts warranty. The manager of the hardware design and manufacturing company said:

> *"Our company signed a selling contract with Company E. Our company followed its demand plan to arrange a manufacturing schedule. …Company Q took responsibility for providing the required hardware as specified and installing and maintaining it…. Our company suggested some features in the hardware design*

and provided five-year a warranty for it …"

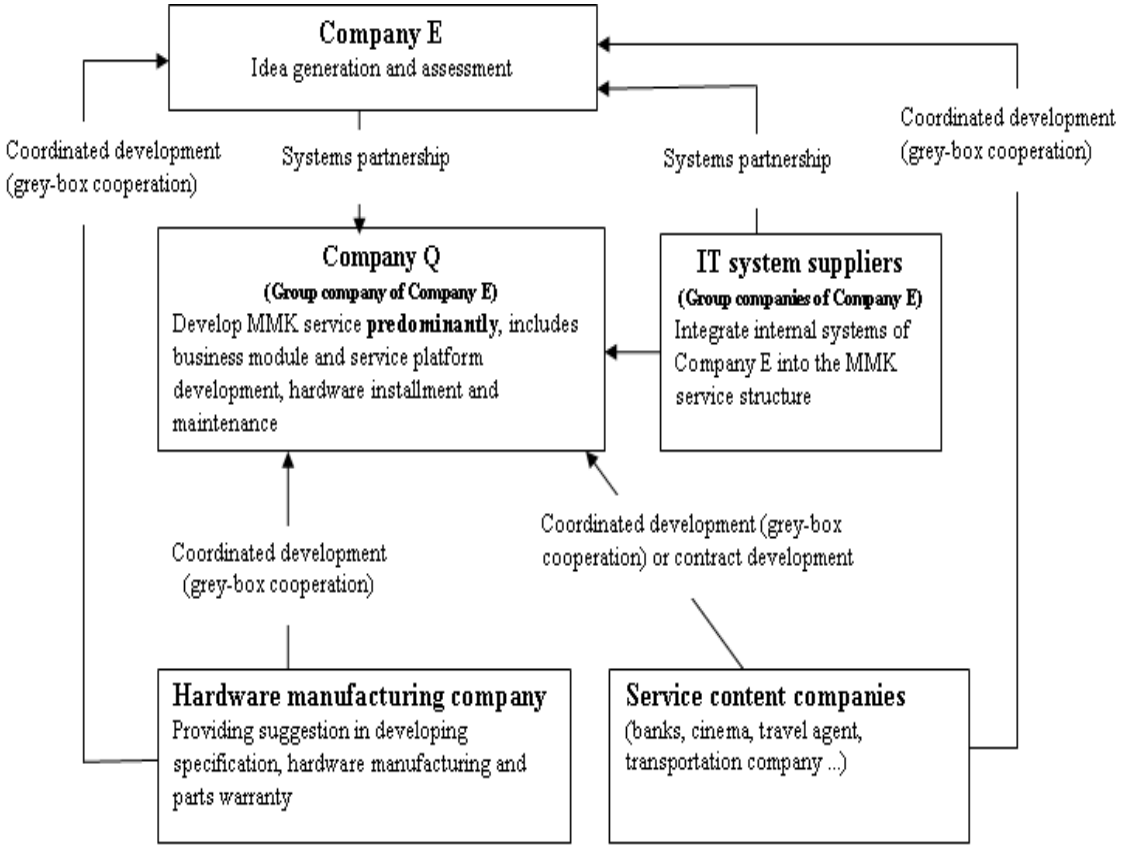

Figure 6.7: The intensity of inter-firm collaboration between Company E and its suppliers in the development of the multiple media kiosk service
Source: Summarized by the author

Regarding the cooperation with the service content companies, Company Q signed a service contract with them on the basis of the existing cooperation or business module. The content of this service contract included the specification of the user-interface design, the IT system requirements to connect the two IT systems, the operation procedure, and the financial regulations Sometimes service content companies sign a three-sided contract with Company E and Company Q because service content companies highly trust on Company E. However, Company Q also used coordinated development (grey-box cooperation) with some service content companies, such as banks and the government because to do so fitted both IT systems' requirements and the first-time development of the business module. Company E may be involved in designing a specification in order to indicate the requirements of its IT system.

6.3.2 Company F

Company F used cross-functional meetings within the company to discuss and integrate the development of different functions (e.g. marketing, IT and training) in the process of service development. Each function was developed by a section from a different department and discussed its ideas and problems at various regular meetings. The Figure 6.8 shows the responsibilities of each actor and the intensity of the inter-firm collaboration between Company F and its suppliers.

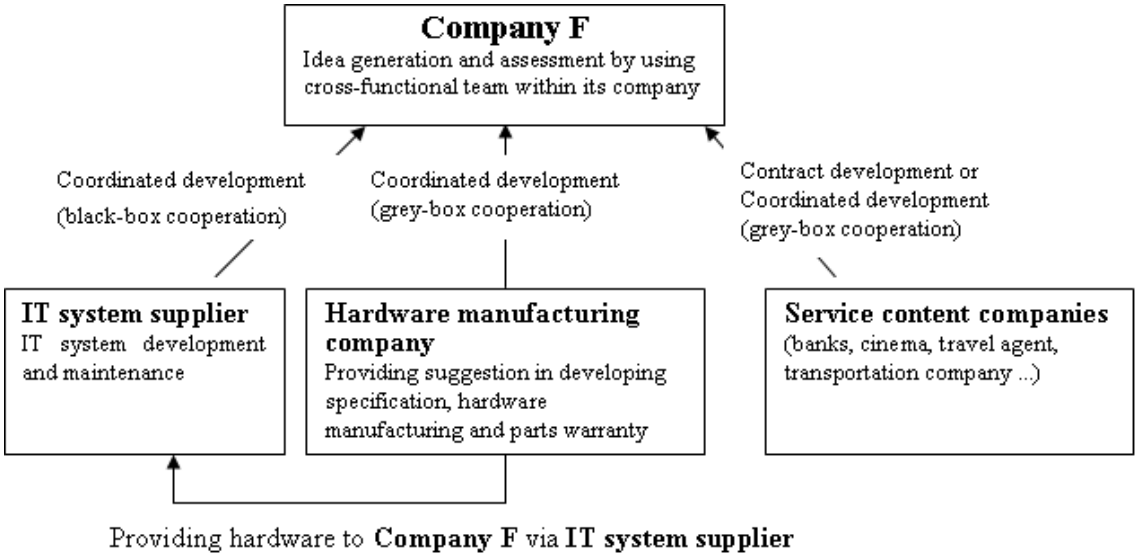

Figure 6.8: The intensity of inter-firm collaboration between Company F and its suppliers in the development of the multiple media kiosk service
Source: Summarized by the author

Company F basically used coordinated development (black-box cooperation) with its IT system supplier because the IT department of Company F provided only its requirements to the supplier of its IT system. Then the IT department of Company F confirmed the detailed specification and checklist with this supplier. Finally, Company F used a checklist with its IT system supplier to test the developed functions and reported problems. The IT system supplier also installed the hardware and undertook a maintenance service in this service development. The IT section manager from Company F said:

> *"Our company outsourced its IT system development to our IT system supplier. We provided the IT requirements to the IT system supplier and then it provided more detailed specifications for us for confirmation. Finally, it developed and coded this IT system in terms of the confirmed specifications. Our company also asked for some future advice in our IT system because it fully realized our*

framework and the problems of an IT system."

Moreover, Company F also used coordinated development (grey-box cooperation) with its hardware manufacturing company. The hardware supplier provided feasible specification and suggestions and developed a prototype for Company F to confirm the final specification. Finally, the hardware manufacturing company supplied its product to Company F via Company F's IT system supplier (a one-stop service). The assistant manager of the hardware manufacturing company said:

> *"Our company has the capacity to develop a software and hardware system for Company F. But Company F preferred its existing IT system supplier to develop its software system. We signed a development contract with a software supplier and Company F. After that, we co-developed with Company F the design specifications of the kiosk and produced it. Then our company supplied the hardware and component warranty to Company F via its IT system supplier because the IT system supplier installed it and undertook a maintenance service for Company F."*

Regarding the cooperation between Company F and the service content companies, Company F signed service contracts (contract development) with them on the basis of the existing IT system or business module. The content of the service contract provided suppliers with the specifications of the client-interface development and the connection of the two systems, the operation procedure and the financial terms. However, Company F may have used coordinated development (grey-box cooperation) with some service content companies because of having to fit the requirements of both IT systems or of designing new business module.

6.3.3 Company H

Company H was the first Taiwanese convenience store chain to provide a multiple media kiosk (MMK) service. It used a cross-functional team and assigned a project manager to execute and manage all the development tasks within the company. In its different stages, the project team was managed by different departments. For example, the team was managed by the general manager's office in the idea generation stage because this department could so easily coordinate the different departments. Next, the team was transferred to IT department in the system development stage, followed by marketing department. Figure 6.9 shows the responsibilities of each actor and the intensity of the inter-firm collaboration between Company H and its co-operators. The marketing manager from Company H said:

"Our company developed its IT system and business modules by ourselves. We grouped a team to develop this service, which was managed by different departments. The team was managed by the general manager's office in the initial design stage in order to integrate different opinions from different departments. After that, the team was transferred and managed by IT department in the second stage because it suited the development of the software system and the hardware. Finally, the team was transferred and managed by the marketing department in order to develop business modules and promote this service."

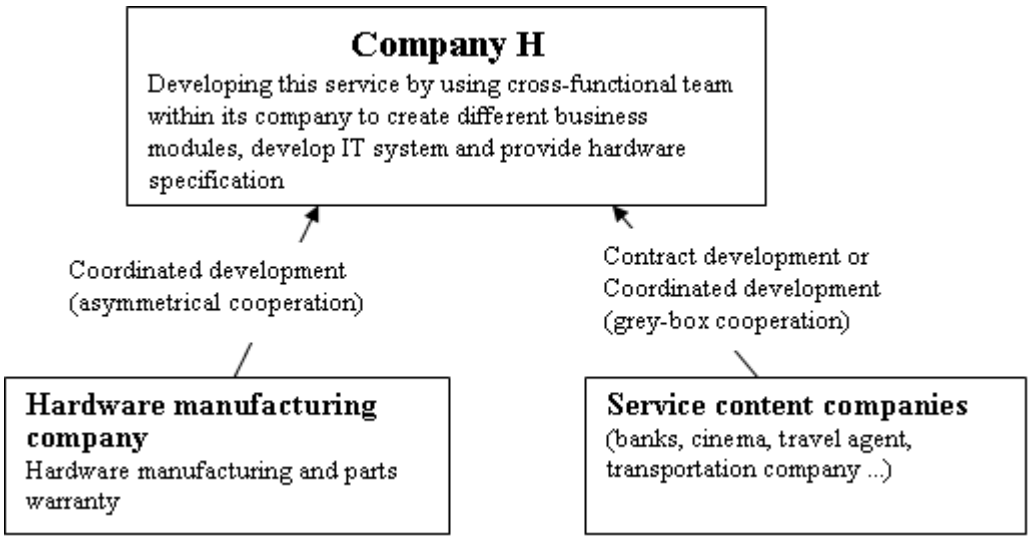

Figure 6.9: The intensity of inter-firm collaboration between Company H and its partner firms in the development of the multiple media kiosk service
Source: Summarized by the author

Moreover, Company H used coordinated development (asymmetrical cooperation) with the hardware manufacturing company and indicated to this company what its requirements and specifications were. Furthermore, Company H basically used contract development with some of the service content companies on the basis of Company H's existing business module or IT system. The content of the service contract gave suppliers the specifications of the user-interface development and connection of the IT systems, financial terms and the operation procedure. Coordinated development (grey-box cooperation) was also used with some of the co-operators (e.g. banks and telecom companies) in terms of the reasons for the IT system's requirements, device compatibility and first design of a cooperative model. One marketing manager from Company H said:

"Some of the business modules used coordinated development with the service content companies, such as banks because of concerns over Internet security.

The IT staff on both sides had to work hard to develop this business module. In some of the business modules such as ticket sales, our company developed this module and system and then they connected this platform for ticket sales. Our company also used contract development with the service content companies to develop these kinds of business module."

6.3.4 Company O

Company O played only a channel role in developing a multiple media kiosk service and all the developments were carried out by its partner firms. Company O provided only the space in one of a chain of convenience store where the hardware could be located and the payment collected. External companies (including IT system suppliers and a hardware manufacturing company) formed a team to develop this service and cooperated for service testing with Company O in a specific region (involving 60 stores). Unfortunately, this cooperation was suspended in 2006 because of the lack of service variety and inter-organizational integration. Figure 6.10 shows the responsibilities of each actor and the intensity of the inter-firm collaboration between Company O and its suppliers.

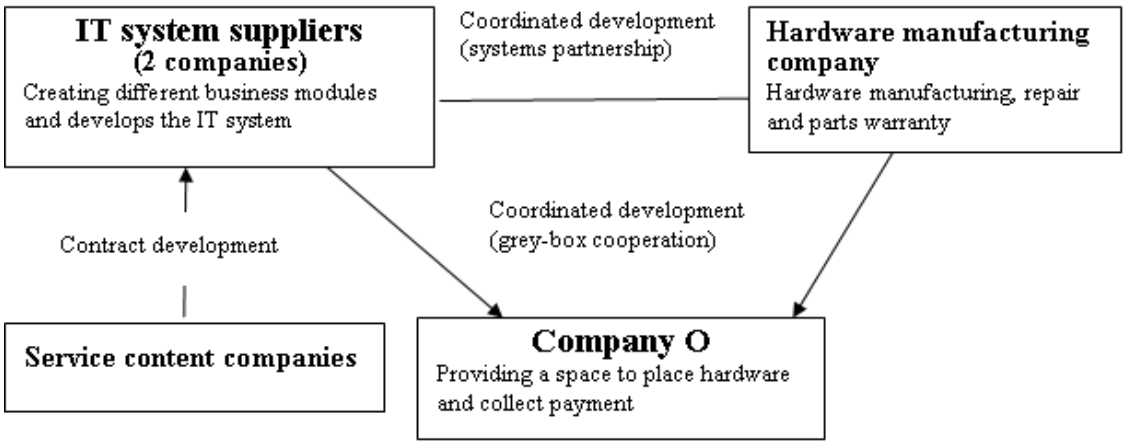

Figure 6.10: The intensity of inter-firm collaboration between Company O and its suppliers in the development of the multiple media kiosk service
Source: Summarized by the author

Regarding the cooperation between Company O, the IT system suppliers and the hardware manufacturing company, Company O used coordinated development (grey-box cooperation) with them and provided them with some suggestions based on the IT system requirements of Company O. The IT systems of the convenience store chain are connected to each store separately and the headquarters of convenience store

chain has to avoid any possibility of risk or problem as the result of connecting the two systems. One of the marketing managers who came from Company O said:

> *"Our partners played a central role in developing the MMK service. Our company helped them to promote this service if they confirmed the service contents that they provided. Our company just provided space and staff to help consumers use this service… Our company signed a contract with them after we defined the rights and responsibilities of both sides. …Our company co -developed with them when they connected with our system."*

6.3.5 Cross-case comparison among the different companies in the intensity of inter-firm collaboration

From the above discussion, it is clear that the four convenience store chains played different roles in the development of the MMK service. Company E used coordinated development (systems partnership) with its group company – Company Q – to develop and manage this service development. Company E played a key role in coordinating the different affiliated companies, providing marketing support and controlling the service quality in the development of this service. Companies F and H used cross-functional teams within their companies to develop this service. Company O provided only some space in a convenience store where the hardware could stand and payment could be collected. To consider the development of the IT system, Company E cooperated with its group companies (in a systems partnership) which took responsibility for different domains of the IT system. Company F basically used coordinated development (black-box cooperation) with the existing IT system supplier and provided what the existing IT system supplier required (e.g. the service requirements and a checklist). The existing IT system supplier also informally provided the relevant knowledge and suggestions to Company F in developing its IT system. Company H developed the IT system within its company. Company O used coordinated development (grey-box cooperation) with its suppliers to develop the IT system.

As regards hardware manufacturing, Company Q signed a manufacturing contract with a hardware design and manufacturing company and became involved in the specification and design of its own hardware. This can be seen as an example of coordinated development (grey-box cooperation). Company F also used coordinated development (grey-box cooperation) with its hardware supplier, which came up with a feasible specification and developed a prototype for Company F. Company H used coordinated development (asymmetrical cooperation) with a hardware manufacturing

company and presented its requirements to this company.

To consider the cooperation between the service content providers and Companies E, F and H, the companies developed and signed a selling contract with some of the service content providers on the basis of their existing IT system or business module. The service contract provided suppliers with the specifications for developing a user-interface in the kiosk and connecting the IT systems, the operation procedure and the financial regulations. This is an example of contract development. The companies also used coordinated development (grey-box cooperation) with some service content providers when they mutually adjusted the IT requirements with their IT system supplier or developed a new business module in the kiosk. Table 6.3 shows that the four convenience stores used different degrees of intensity in their inter-firm collaboration with different actors in developing the multiple media kiosk service.

Table 6.3: Cross-case comparison of the degrees of intensity in the inter-firm collaboration between four convenience stores in developing the multiple media kiosk service

	Company E	**Company F**	**Company H**	**Company O**
Service developer	Coordinated development (systems partnership)	Internal development	Internal development	Coordinated development (grey-box cooperation)
IT system supplier	Coordinated development (systems partnership)	Coordinated development (black-box cooperation)	Internal development	Coordinated development (grey-box cooperation)
Hardware manufacturing	Coordinated development (grey-box cooperation)	Coordinated development (grey-box cooperation)	Coordinated development (asymmetrical cooperation)	Coordinated development (grey-box cooperation)
Service content company	Contract development or Coordinated development (grey-box cooperation)	Contract development or Coordinated development (grey-box cooperation)	Contract development or Coordinated development (grey-box cooperation)	None

Source: Summarized by the author

6.4 Cross-case comparison between two selected services in the intensity of inter-firm collaboration

From the above discussion regarding the intensity of inter-firm collaboration in the development of two selected services, it appears that the companies under review tended to use a high degree of intensity in their inter-firm collaboration (coordination development-systems partnership) with suppliers in developing important functions (e.g. IT function and logistics) when they developed the two selected services. This is because the task of these functions of integrating different actors or pre-suppliers to contribute to the development of new services is very complicated. In terms of the task, which is complicated because of the relationship between the companies under review and these suppliers (e.g. the IT system suppliers and the logistics), the companies cannot separated these important functions in order to cooperate with suppliers intensively for the sake of identify possible problems and solutions, share related information/knowledge and control the progress and quality of the service as it developed. For example, Company E, in particular, often used coordinated development (system partnership) with its group companies when it contributed to developing a new service framework. Companies F, H and O also used a high degree of intensity in their collaboration to prepare major IT system designs with external companies. The case companies also adopted a lower degree of intensity (e.g. contract development) in their inter-firm collaboration with some suppliers, such as e-shops and some of the service content companies. This is because the task of these suppliers can have been simply to define their object, provision and restrictions and separate them from the case companies' development activities. In addition, the case companies do not have enough resources/knowledge available to perform these tasks. Case companies used only coordination meetings with their suppliers to define the task to be done and the regulations to follow; they formed a contract with them in order to expand the scope of their services to the consumers. According to the above discussion, this present study can claim empirical evidence that the intensity of inter-firm collaboration with suppliers in the process of developing new services (in particular online shopping with pick-up at store service development) depends on the degree of task complexity in different functional developments. The degree of task complexity is often determined by the number of different actors or functions which must mesh together in the functional development of a new service/product. Both the service developments considered here

belonged to e-commerce services and involved different functions for information transfer between different actors. The development of the online shopping with pick-up at store service is the more complex of the two in the matter of integrating information transfer among the IT systems of different functional actors, e.g. distribution companies (logistic function), convenience store chains (marketing) and channel role and e-shops (product provider) and coordinating the existing operation procedures of the different functional actors to advance this service development. For example, the case companies have a higher intensity of inter-firm collaboration with the IT system suppliers because the latter often coordinate an IT system of related actors, such as a self-owned distribution company, third party distribution company, convenience store chain and e-shop, on the basis of different requirements and the restrictions of the actors' IT system in the development of the online shopping with pick-up at store service. According to previous studies, the relationship between intensity and task complexity in inter-firm collaboration has been initially identified: the intensity of inter-firm collaboration is high when a task is more complex (Nylen, 2007). Her research used different terms to define this intensity, including coordination, co-operation and integration, which focused on the degree of involvement and interaction among parties. This present study further used different forms of inter-firm collaboration to identify the intensity between cooperative firms. Different forms of inter-firm collaboration can help to distinguish more clearly the different firms' responsibilities and decision making in inter-firm collaboration in new service development.

Moreover, this present study further found that the degree of newness may also influence the adoption of intense inter-firm collaboration when the case companies cooperate with the service content companies in the development of the MMK service. This is because the convenience store chains provided an IT platform (kiosk) and identified different business modules to cooperate with the various service content companies in order to expand the scope of the MMK service. Some service content companies may provide similar service content in each business module. This service development mainly focused on the IT connection between the convenience store chains and the service content companies and promoted a new business module in the kiosk. According to the different degrees of newness in different business modules, the case companies used a higher intensity of inter-firm collaboration (grey-box cooperation) with some of the service content companies when they mutually adjusted the two IT

systems for connection or developed a new business module in the kiosk. Case companies often cooperate more closely with suppliers to identify their IT requirements and potential problems and share the related knowledge/resource in order to construct a new business module. In addition, case companies developed a service contract and signed it with some of service content companies on the basis of the existing IT systems of case companies or developed a business module for the kiosk. The contract terms include the IT requirements, restrictions and financial regulation to be followed and the operation procedure to be coordinated. According to previous studies, in developing new products the degree of project newness traditionally defines how much of the existing product must be changed or adjusted (Clark and Fujimoto, 1991; Griffin, 1997). The different degrees of project newness often involved different degrees of technological uncertainty in the process of developing new products. In order to reduce the technological uncertainty of a new product, previous studies suggested that focal firms can seek a closer relationship with the supplier and pool their technological information in developing a new product (Auster, 1992; Hagedoorn and Narula, 1996). This present study provides insight in identifying the relationship between supplier integration and project newness when focal firms develop non-fundamental functions and quickly expand the scope of the existing business module. Focal firms can adopt a lower degree of intensity of inter-firm collaboration with the supplier when the degree of project newness is relatively low (e.g. based on the existing operation of the focal firm). Additionally, the focal firm may use more intense inter-firm collaboration with the first entrant to identify potential problems and reduce its technological uncertainty to contribute to a new business module. A lower degree of inter-firm collaboration appears between the focal firm and the second entrant because of the lower technological uncertainty of the existing business module.

In summary, the present study found that the degree of intensity of inter-firm collaboration is influenced by the different degrees of task complexity and of newness in different service developments. Because the characteristics of the task are complex and associated with the focal firm’s development activities in the functional development of developing new services, case companies often use very intense inter-firm collaboration with suppliers in order to integrate different actors’ requirements, reduce technological uncertainty and further improve service quality. When a task is simpler and can be separated from the focal firm’s development

activities, case companies may use a lower degree of inter-firm collaboration with suppliers. Additionally, the degree of project newness may influence the intensity of the inter-firm collaboration in terms of different degrees of technological uncertainty. Focal firms adopt more intense inter-firm collaboration with the first entrant to identify its IT requirements and problems and share the related knowledge to reduce the technological uncertainty of a new business module. Once the requirements and restrictions of the new business module have been clearly defined, the focal firm adopts a lower degree of inter-firm collaboration with the second entrant, in order to quickly expand the scope of the existing business module.

6.5 The relationship between the intensity of inter-firm collaboration and the speed of new service development in two selected services

This section further investigates the relationship between the intensity of inter-firm collaboration and the speed of new service development in two selected service developments.

6.5.1 Online shopping with pick-up at store service

Investigating the relationship between the intensity of inter-firm collaboration and the speed of new service development in developing the online shopping service with pick-up at store, the study found that a lower degree of intensity in the inter-firm collaboration with suppliers appeared to speed up the development of new services in the IT function. Convenience store companies adopted collaborated with less intensity with other firms (contract development), such as applied IT system suppliers and signed service contracts with them in order to reduce the time taken to identify both the IT systems and the problems of connection between systems. Suppliers simply followed the requirements and restrictions given by the contract terms to develop the service content. A manager from an e-map company (pre-supplier of IT system supplier) said:

> *"The cooperation between our company and partner firm is simpler than coordinated development because there is no problem of system integration. The speed of developing new services tended to increase because our company designed specifications for partner firms to develop and directly connect with our system."*

When we look at the same issue with regard to strategic suppliers in functional development, we find that the convenience store companies used coordinated

development and spent more time on developing important functions with suppliers, in particular on developing the functioning of the IT system. The development of the online shopping with pick-up at store service mainly relies on information transfer between different actors. The IT platform serves as the foundation in this service development, because it has to make the information transfer between actors (i.e. the convenience store chains, self-owned distribution company, third party distribution company and e-shop). Problems of IT system connection and information transfer between different actors constantly arise. The IT system supplier has to discuss IT system requirements and restrictions with the different actors so as to develop a platform for the information transfers they will make. It may spend a good deal of time in repeated examinations of the problems with different actors to ensure that the IT system operates smoothly. A manager from the IT system supplier stated:

> "*There are many actors involved in this IT system development. We often had meetings with actors responsible for different tasks. These actors then developed individually. We had to wait for each actor to finish its task before the system could function … We also had to spend some time testing, integrating and revising the functions before the IT system started to operate. When we used contract development, the speed of development increased beyond that of coordinated development.*"

In the above research finding, the present study is consistent with the arguments in previous studies that intensive supplier involvement in product development can prolong the development time (Littler et al., 1995; Littler et al., 1998; Von Corswant and Tunälv, 2002). A focal firm collaborating more intensively with a supplier may make their tasks more time-consuming and the difficulties of management and control in inter-firm collaboration.

Moreover, the different perspectives from the various IT system suppliers derived from the different degrees of complexity of the tasks they faced in developing this service. Convenience store chains used coordinated development with their co-operators to develop new IT platforms and connect systems in order to transfer information between different actors. Some IT problems between relevant actors made it necessary to spend time in discussion and integration because the IT system supplier had to understand the requirements of the different actors and suggest possible solutions and specifications to integrate them for information transfer. In contrast, convenience store chains also cooperated with certain IT system suppliers through contract development. The task of

these suppliers was relatively simple and could be clearly identified and separated from the development activities of the focal firms. In addition, the convenience store chains did not have enough resources or capacity to succeed in this task. When the task was simpler, more easily identified and individually developed, the convenience store chains often signed a service contract with the IT companies to develop sub-systems contributing to the main IT system platform. If the service contract clearly defines the development responsibility of the supplier, the IT system requirements and restrictions, operation procedure and financial regulations to be followed, then the supplier can individually carry out the development activities without needing to spend much time on repeated examinations to adjust the systems with one another. If this is the case, the less intense inter-firm collaboration can save time in developing new services when the tasks are less complex. More intense inter-firm collaboration between firms may increase the time required for developing new services together when the tasks are more complex.

6.5.2 Multiple Media Kiosk (MMK) service

Focusing on the same issue in the process of developing the multiple media kiosk (MMK) service, a similar phenomenon was found; here, too, a lower intensity in the inter-firm collaboration between convenience store chains and suppliers can speed up the development of new services. These suppliers simply followed the contract terms, including the IT requirements and restrictions, the method of profit sharing and the operation procedure between firms, to provide their service content for the kiosks when these suppliers cooperate with the convenience store chains on the basis of contract development. These suppliers did not spend time on adjusting and fitting both IT systems because they needed only to follow the IT requirements and restrictions to adjust their IT systems and connect them with the kiosk. A manager from a service content company made this point:

> *"Our company cooperated with the convenience stores by contract development. The contract development mode reduced the development time because our company did not have to spend too much time developing the interface and communicating with them … Our company just followed its specifications and requirements to develop it.*

In addition, the convenience store chains may use coordinated development with suppliers in order to develop a new business module. It may take more time to identify

the IT requirements and restrictions and then connect the two IT systems. Both sides (the convenience store chain and the supplier) also have to spend time on making mutual adjustments and repeated examinations to test the connection of the two IT systems and to make the new business module operate smoothly in the kiosks. A marketing manager from Company H claimed:

> *"If the service content companies have to develop parts of some modules, it would need a lot of time to develop them because of things like partner firms' development schedules and the progress of their internal development. If our company used contract development with the service content companies, they simply followed the specifications that our company gave for connecting the systems. The new services were developed more quickly."*

The present research has found empirical evidence that the degree of intensity in inter-firm collaboration influences the speed at which of new services develop. The adoption of more intense inter-firm collaboration may increase the time required to develop a new service; this is consistent with the arguments in previous studies that intensive supplier involvement in product development may increase development time (Littler et al., 1995; Littler et al., 1998; Von Corswant and Tunälv, 2002).

Moreover, the present research found that the relationship between the intensity of inter-firm collaboration and the speed of new service development may depend on the newness of a project in this context. A manager from Company Q said:

> *"The different levels of intensity of inter-firm collaboration influence the speed of new service development in terms of the degree of newness in different business modules …Our company categorized different business modules and, in the first instance, spent much time on development with a supplier through coordinated development in order to identify the IT requirements and restrictions of the business module. After that, any similar content companies just used contract development and followed the existing specifications to develop it. This speeded up the process of developing new services."*

Convenience store chains often use contract development with service content companies to develop new projects if this project development is based on an existing system or business module within the convenience store chains. This makes new project development quicker because the two sides do not need to spend too much time on fitting and testing both IT systems. Service content companies directly followed the contract terms (i.e. the specifications for connecting both IT systems and the user-interface) to supply their service contents to each kiosk. When a project is

comparatively new, the costs of its technology, market uncertainty and communication may increase. Convenience store chains often use coordinated development with service content companies to develop a new business module, because the development requires different domains of knowledge and strategic resources. This new project development is slower because more time needs to be spent on making the two IT systems fit and solving unexpected problems. The relationship between the intensity of inter-firm collaboration and the speed of new service development may depend on different degrees of the project's newness. The use of less intense forms of inter-firm collaboration speeds up the new service development when projects are not so new.

6.5.3 Cross-case comparison in the relationship between the intensity of inter-firm collaboration and the speed of new service development

This section identifies differences and similarities between these two selected services in the relationship between the intensity of inter-firm collaboration and the speed of new service development. A common issue concerned the time spent on the IT system connections. This problem, in turn, influenced the relationship between the intensity of inter-firm collaboration and the speed of new service development. This is because these two services belong to the electronic commerce service. The development of an IT system plays an important part in integrating the information exchanged between the actors involved in these two services. In developing these services, this present study found that the intensity of inter-firm collaboration has a negative influence on the speed of new service development (in particular, the development of the IT system), which is consistent with the arguments of previous studies (e.g. Littler et al., 1995; Littler et al., 1998). If the focal firm cooperates with suppliers intensively, it may increase the time spent on new service development. This may also increase the cost, complexity and difficulty of managing and controlling the project in inter-firm collaborations.

Moreover, there were also differences between selected service developments in the relationship between the intensity of the inter-firm collaboration and the speed of new service development. In developing the online shopping with pick-up at store service, this present study found empirical evidence that the relationship between the intensity of inter-firm collaboration and the speed of new service development generally depended on different degrees of task complexity, in particular, the IT system development. The different information flows between the actors concerned were

integrated in the IT system function. The IT staff from different actors had to spend time on integrating the IT systems with the other actors, examining the connections and solving unexpected problems. Accordingly, the case companies often used coordinated development with a strategic supplier to develop the main IT system and took a long time to integrate the IT requirements and restrictions from the actors across the different functions, in order to transfer information between them. The task is more complex across different functions and closely related to the focal firm's development activities. Focal firms must collaborate more intensely with other supplier firms in this task and this adds to the development time. In contrast, case companies also use contract development with a supplier to develop sub-systems because this task is simpler and independent of the focal firm's development activities. Case companies developed and signed only their service contract with a supplier and this clearly identified the requirements and restrictions. In this task, the suppliers directly followed the terms of the contract. Neither side spent much time on adjusting and fitting the IT systems.

Previous studies argue that greater project complexity increases development time (Meyer and Utterback, 1995; Griffin, 1997). This is because complex tasks have many steps and require many connections between different functions, which all take time. The present study found that focal firms use intensive collaboration with strategic suppliers to accomplish the many steps of their complex tasks and integrate information across different functions, leading to increased development time. This empirical finding provides a better insight into the level of intensity adopted in inter-firm collaboration and the association of this issue with the speed of new service development under different degrees of task complexity. When tasks are more complex, focal firms adopt a higher degree of intensity of inter-firm collaboration and this may increase development time.

Furthermore, in the MMK service development, the development of business modules mainly required information to be transferred between the case companies and the service content companies. In order to enrich the service content in the kiosks and to increase the profit turnover, the MMK service has to accumulate different business modules. Case companies often use contract development with service content companies on the basis of an existing IT system or business module. This new project development was probably quicker because they did not spend too much time on fitting

the two IT systems together. If the business module is totally new, case companies often use a high degree of intensity in collaboration (e.g. in coordinated development) with the service content companies in developing a new business module in order to acquire different domain knowledge and strategic resources and identify the IT requirements and restrictions of the new business module. Developing a new project is slower because they may need to spend some time on fitting the two IT systems together and on solving unexpected problems.

According to previous studies, effective supplier integration can reduce the development time when the product line is mature and the development goals are well-designed (Eisenhardt and Tabrizi, 1995). This implies that the project's newness may influence the speed of new product development. A very new project makes it difficult to reduce technological uncertainty and may lead to inefficient development (Moenaert et al., 1995). The present study found that focal firms adopt more intense inter-firm collaboration with suppliers to discuss potential problems, reduce technological uncertainty and further identify the IT requirements for connecting the two IT systems when the business module is relatively new. This empirical finding provides a better understanding of the degree of intensity adopted in inter-firm collaboration and the way in which this issue is associated with the speed of new service development under different degrees of project newness. Very intense inter-firm collaboration may reduce the speed of new service development when a project is very new. When a project is less new, less intense inter-firm collaboration may speed up the new service development.

6.6 Summary

The main focus of this chapter was to identify how the intensity of inter-firm collaboration varies across four cases and two selected service developments. In more detail, it enquired how the intensity of inter-firm collaboration influenced the speed of new service development and compared examples across two selected service developments. The present research found that the level of intensity in inter-firm collaboration is influenced by the degree of task complexity and the degree of project newness. When the task is complex and is associated with a focal firm's development activities, case companies often collaborate more intensely with suppliers. Case

companies also adopt less intense inter-firm collaboration with some suppliers when the development task is simpler and can be separated from the focal firm's development activities. In addition, when case companies developed different business modules for the MMK service, they also collaborate with suppliers on the basis of different degrees of newness in the project. Case companies collaborate less intensely with suppliers when the development task is based on existing business modules or an existing IT system.

Moreover, the present research found that there is a negative relationship between the intensity of inter-firm collaboration and the speed of new service development, which is consistent with the arguments of previous studies that focal firms adopting more intense inter-firm collaboration may increase the time required to develop new services (e.g. Littler et al., 1995; Littler et al., 1998). Additionally, the present study further provided a better insight into the relationship between the intensity of inter-firm collaboration and the speed of new service development depending on different degrees of complexity in the task, for example, when case companies developed the online shopping with pick-up at store service. A higher intensity of inter-firm collaboration may slow down the speed of new service development when tasks are more complex. Furthermore, the present research also found empirical evidence that, when case companies developed different business modules with service content companies, the relationship between the intensity of inter-firm collaboration and the speed of new service development depends on the degree of project newness and this quickly expands the scope of different business modules for the kiosks. When projects are less new, focal firm using less intense inter-firm collaboration may reduce the time required.

Chapter 7: Discussion of the empirical findings- Interdependence and trust

7.1 Introduction

At stated in Chapter 3, interdependence and trust are essential to minimise the different types of development risk (e.g. opportunistic behavior and hold-up risk), to sustain recurrent interaction and to maximise the transaction value between cooperative firms, which in turn, leads to better performance in inter-firm collaboration. The current chapter aims to identify how interdependence and trust vary across four cases (Companies E, F, H and O) and two selected services (the online shopping with pick-up at store service and multiple media kiosk service). In particular, the influence of interdependence and trust on the speed of new service development will be compared across two selected service developments.

The current chapter is organized as follows: first, section 7.2 compares the ways in which Taiwanese convenience store chains use different types of interdependence with suppliers in developing the two selected services. Building on previous studies investigating sources of dependence (Woolthuis et al., 2005; Laaksonen, et al., 2008), the present study considers two types of interdependence: switching cost and valuable resources) to identify the interdependent relationships between convenience store chains and their partner firms in the two selected service developments. Second, section 7.3 compares the ways in which interdependence influences the speed of different types of new service development.

Third, section 7.4 compares the ways in which Taiwanese convenience store chains use different types of trust with suppliers in developing the two selected service developments Previous studies have empirically identified different dimensions of trust such as credibility, benevolence, reliability, honesty, ability, goodwill, contract trust, competence trust, reciprocity and fairness (Sako and Helper, 1998; Dyer and Chu, 2000). The present research adopts Sako's (1992) typology of trust to identify the trust between convenience store chains and their partner firms in two selected services. These comprise three types of trust: contractual trust, competence trust and goodwill trust. The influence of trust on the speed of new service development in different types of new

service developments is further compared in section 7.5.

7.2 The interdependence between convenience store chains and related actors in two selected service developments

As Chapter 6 argued, developing the online shopping with pick-up at store service in four case companies was of two kinds. The biggest convenience store chain – Company E – established this service individually. The other convenience store chains formed a group which established a joint venture to develop this service. This section begins to illustrate what kinds of interdependent relationship four convenience store chains use with different actors in the two selected service developments.

7.2.1 The interdependence between convenience store chains and related actors in the development of the online shopping with pick-up at store service

7.2.1.1 Company E

Initially, Company E cooperated with its group companies, one IT system supplier and one logistic company, to create the service. The IT system supplier split off from Company E. This company takes full responsibility for developing part of the internal IT system which is related to the connection between the POS system and the internal IT system, the most important system of the convenience store. In the second stage there was another IT system supplier involved in this service development. The company was owned by Company E and was assigned to develop the other part of the internal IT system. A previous manager from the IT system supplier said:

> "*Company E recruited fewer people and focused on developing a business model. This IT company recruited more people to develop and maintain this IT system. Company E totally relied on this company to develop the IT system because it was exclusively customized to suit Company E's requirement. Company E also counted on this company's technological capacity and then assessed the technological capacity of e-shops because Company E's staff did not fully understand the related technological involved."*

The logistics company (Company W) is the only company that provides a delivery service directly from the e-shops to each convenience store of Company E. E-shops relied on this service platform to deliver their goods to consumers. There are three third party distribution companies which can help e-shops to deliver goods to Company W if they themselves lack the available resources for transportation. In addition, these third party distribution companies function as agents for Company E, which sources and

invites e-shops to join the online shopping with pick-up at store service.

In the second stage, Company P was set up by Company E to take over the responsibility of developing this service. A couple of the applied IT system suppliers were involved in helping Company P to develop new IT functions. To maintain the stability of the internal IT system, Company E provided an interface to connect these newly developed IT functions for the online shopping with pick-up at store service. These system supplier companies have good resources for developing new IT functions. A manager from one of the applied IT system suppliers said:

> "*Company P relied on our company to develop some parts of the functions because our company has the capacity to do it well. Company P did not have to recruit many staff to develop these functions."*

In addition, Company P has a few partner firms to execute these tasks. These companies have similar capacity to tackle them. Company P cooperated with a few applied IT system suppliers in order to reduce the development risks and to control service quality. One member of the marketing staff from Company P said:

> "*When we choose our service supplier, our company spends a long time doing surveys and assessments. When our company selected these service suppliers, we also defined their role clearly, for some of the suppliers are well able to develop one part of the IT system. When our company has a new project to set up, we invite related suppliers to get involved in it. Our company has more than two companies which can do the same tasks. When our company found that one company has a problem of service quality, we invited other companies to develop the other parts of tasks in order to reduce development risk and control service quality."*

The cooperation between Company P and the e-shops was on the basis of a valuable resource. E-shops can enhance their trustworthiness by distributing their goods through this service as set up by Company E and Company P. The consumers can collect online-purchased goods in Company E's convenience stores. Equally, Company E could use this service to attract more consumers to visit. Table 7.1 shows the interdependence between Company E and the actors concerned.

Table 7.1: The interdependence between Company E and related actors

Development actors	**Interdependence between Company E and actors**
Distribution company - Company W	**High switching cost** The only distribution company that provided a logistics

	service directly from e-shops to each convenience store owned by Company E.
IT system suppliers	**High switching cost** Each company provides a different part of the internal IT system development for Company E in the target services.
Third party distribution companies	**Valuable resource** These companies function as agents for Company E. They invite e-shops to join this service and provide them with a delivery service from themselves to Company W.
E-shops	**Valuable resource** (1) E-shops joined this service to provide their goods and make it convenient for their consumers to collect their goods. (2) Company E also uses this service to attract consumers to visit.
Marketing - Company P (second stage)	**High switching cost** The company continues to develop this service with Company E and invites e-shops to join this service. It also integrates requirements from different actors (i.e. Company E, distribution companies and IT system suppliers)
Applied IT system suppliers (second stage)	**Valuable resource** These companies develop new service functions to Company P, which saves Company P's time and cost. They also help Company E to develop new service functions and connect with the main IT system.

Source: Summarized by the author

Based on the information shown in Table 7.1, it can be seen that the cooperation between Company E and its partner firms to develop its marketing, logistics and IT functions tended to feature high switching costs. Company E mainly relied on these companies to develop and execute the same functions in the target services. The suppliers of the applied IT system were contracted by Company P (Company E's group company) to develop some functional systems. The relationship between them was based on the valuable resource which suppliers represented, obviating the need for Company P to hire and train employees to develop these functional systems. The cooperation between Company E and e-shops was on the basis of the valuable resources committed. For customers, the e-shops providing their goods on this platform and

collecting their goods at the convenience store encouraged more consumer visits and increased turnover.

7.2.1.2 Companies F, H and O

In order to consolidate market power (with an almost 50% market share), Company C was set up by Companies F, H, O and N (Company H had been merged with Company F in 2007, but its parent company still held 25% of the stock of Company C) in the first stage to develop this service. Convenience store chains used this company to increase their bargaining power with Company E and negotiate with the e-shops in the first stage. Convenience store chains also used Company C to buy some goods in order to reduce purchasing costs (joint purchasing). In the second stage, this company played a dominant role in developing this service and integrating suggestions from different actors (i.e. the convenience store chains, third party distribution companies and the IT system supplier).

Regarding the logistic routine of this service, this group (Companies F, H and O) in the first stage used a third party distribution company to deliver goods from e-shops to different convenience store chains. This is because this third party distribution company can deliver goods from e-shops to different convenience store chains. In the second stage, this service was restructured and some actors were replaced. A new third party distribution company was invited to join this service because of problems with the delivery capacity of the previous third party distribution company. The new third party distribution company was selected because it already was a partner providing a delivery service for Company F in another service operation. This company helped deliver goods to the distribution companies which delivered goods to the respective convenience store chains. In addition, this third party distribution company also helped Company F deliver goods directly to Company F's convenience stores. The previous manager from this company said:

> *"Our company was the only supplier to deliver goods to Company F's convenience stores. Company F is also the only customer of our company because our company has no capacity to provide services to other companies… In terms of the IT system and delivery capacity, it is difficult for Company F to set up new self-owned logistics in developing the online shopping with pick-up at store service."*

In the third stage, the third party distribution company stopped its delivery service from

the e-shops to the distribution companies which delivered the goods to the convenience store chains. Thus, Company C had to invite another third party distribution company to take over and to transport goods from the e-shops to the distribution company of each convenience store chain. However, the previous third party distribution company (in the second stage) still delivered goods to Company F and was finally acquired by Company F.

To date, there are three third party distribution companies involved in this service and they also provided delivery services to the e-shops in the fourth stage. In terms of the structural design of this group, e-shops have the choice of either delivering their goods to the distribution companies of the respective convenience store chains by themselves or of using the delivery service provided by the three third party distribution companies. The third party distribution companies also function as agents for Company C by inviting e-shops to join this service and managing them. Consequently, Company C could save the cost of recruiting staff to source and manage the e-shops. A manager from one of the third party distribution companies said:

> *"Our company cooperated with either Company E or Company C and helped them to invite e-shops to join this service, provide a logistics service and manage them. Our company helps Company E and Company C in forward integration which provided a total logistics service to the e-shops and delivered goods from them to the convenience store's self-owned distribution companies."*

After the goods from the e-shops are delivered to the distribution companies owned by Companies F, H and O, the distribution companies then delivered the goods to the respective convenience stores. These self-owned distribution companies also provided an equivalent function to the convenience store chains in other services. As to the development of the IT system, Company C outsourced this function to an IT system supplier which helped Company C to develop and manage its IT platform and integrate the data transformation between different actors. This helped Company C save the cost of recruiting staff to develop and maintain the IT system. In addition, as mentioned in Chapter 5, e-shops usually have to provide a home delivery service to their customers. By joining the integrated service structure of Companies F, H and O, e-shops are able to provide an alternative product-delivery method (collecting online-purchased goods at a designated 24-hour service convenience store) to meet the convenience of their customers. Consequently, the convenience store chains could increase the visits made to

their stores by consumers. Table 7.2 shows the interdependence between Companies F, H, O and the related actors.

Table 7.2: The interdependence between Companies F, H, O and the related actors

Development actors	Interdependence between Companies F, H, O and actors
Company C	**High switching cost** Convenience store chains (Company F, H, O, N) form a joint venture (Company C) to strengthen their bargaining power with Company E.
Self-owned distribution companies	**High switching cost** Convenience store chains rely on these companies to provide logistic services from third party distribution companies or e-shops to the respective convenience store chains. They also provide the equivalent function in other services.
IT system supplier	**High switching cost** The only company to develop an IT platform for Company C and to integrate the IT requirements of the different actors.
Third party distribution companies	**Valuable resource** (1) These companies deliver goods from e-shops to the distribution companies owned by the convenience store chains. Consequently, e-shops could economise on delivery costs. (2) These companies function as agents for Company C to source and invite e-shops to join this service. They also help Company C to manage the e-shops which they invited.
E-shops	**Valuable resource** (1) E-shops join this service to provide their goods and to meet the convenience of their consumers in terms of receiving online-purchased goods. (2) Convenience store chains use this service to attract more consumers' to visit them.

Source: Summarized by the author

This being the case, Companies F, H and O formed a joint venture (Company C) to develop the online shopping with pick-up at store service and to enhance its market share. In this service, they collectively used Company C to strengthen their bargaining power to negotiate with the e-shops. The relationship between this group of companies and the distribution companies owned by the convenience store chains was on the basis of a high switching cost because these distribution companies also provided

the same function to support the convenience store chains in other services. In addition, this group of companies cooperated with an IT system supplier to develop and maintain the IT system on which the online shopping with pick-up at store service depended. Their collaboration was on the basis of high switching cost, because this IT Company helps integrate IT requirements from different actors and develops IT systems to satisfy the needs of different actors. The cooperation between this group of companies and third party distribution companies was on the basis of the valuable resources committed. Third party distribution companies act as intermediaries between convenience store chains and e-shops. They indirectly helped Companies F, H and O to increase consumer visits to the convenience stores by sourcing and managing the e-shops. In return, by cooperating with Companies F, H and O, third party distribution firms could rely on the assurance provided by this group's integrated service structure to work with the e-shops and to receive service fees for the use of their delivery. Consequently, third party distribution companies could be sustained by a more stable income. Finally, the cooperation between e-shops and Companies F, H and O was on the basis of the valuable resources which each partner firm contributed to Company C.

7.2.1.3 Cross-case comparison between two groups

Company E cooperated with its suppliers to develop marketing, logistics and IT functions on the basis of high switching costs. These suppliers also provided the same function development for Company E in different services. In order to control service quality and restrict opportunistic behaviour, Company E retained part of the ownership of these supplier companies. The cooperation between Company P (Company E's group company) and the suppliers of the chosen IT system is characterized by valuable resources and knowledge sharing in developing new IT system functions. Similarly, Companies F, H and O also cooperated with their suppliers to develop marketing and logistic functions on the basis of high switching costs. This group of companies had the majority ownership of these supplier firms. In addition, the interdependence between the e-shops and the two groups was on the basis of the valuable resources committed. Two groups established this service, which provided the e-shops with an alternative method of delivery to their consumers. By cooperating with the e-shops, both groups could increase consumers' visits to their convenience stores.

The main difference between the two groups is the level of interdependence between

them and their IT system supplier(s). The interdependence between Company E and IT system suppliers is characterized by high switching cost. Company E has the majority ownership of its IT system suppliers in order to control the progress of developments and to mitigate opportunistic behaviour. In contrast, Companies F, H and O cooperated with the only IT system supplier on the basis of high switching cost. The IT system supplier invested resources to develop an IT system for this group of companies and integrate IT requirements from different actors. This group (Companies F, H and O) only provided a server in the IT system development. Unlike Company E, this group used incentive rewards to reduce opportunistic behaviour. Table 7.3 shows that two groups have interdependent relationships with different actors in developing the online shopping with pick-up at store service.

Table 7.3: The interdependence between two groups and their related actors in the online shopping with pick-up at store service development

Development actors	Company E	Companies F, H and O
Self-owned distribution company	**High switching cost** (Company E used majority ownership to govern this supplier)	**High switching cost** (This group used majority ownership to govern the self-owned distribution companies)
IT system supplier	**High switching cost** (Company E used majority ownership to govern its IT system suppliers)	**High switching cost** (This group used incentive rewards to govern this supplier)
Third party distribution company	**Valuable resource**	**Valuable resource**
E-shops	**Valuable resource**	**Valuable resource**
Marketing company	**High switching cost** (Company E used majority ownership to govern this supplier)	**High switching cost** (This group used majority ownership to govern this supplier)

Source: Summarized by the author

From the perspective of transaction cost theory, the research finding of this research is consistent with previous studies, in that hierarchy can be invoked within organizations if a transaction is based on recurrence, a high degree of uncertainty in its outcome and the specific investment required (Williamson, 1975; 1985). Company E often uses vertical integration with strategic suppliers (i.e. its IT system and logistic suppliers) by sharing

the ownership of specific investments and resources. This is because these suppliers also provide the same functional support for the convenience store chains in developing other services. This control mechanism can be seen as a safeguard against opportunistic behavior and to control development quality and progress (Williamson, 1975; Harrigan, 1984). Similarly, Companies F, H, O also used shared ownership to manage the interdependent relationship with logistic suppliers. In the early stages, this group used only contracts with external companies to deliver goods to the convenience store chains. But this led to the problem of service instability when one supplier decided to withdraw from cooperation.

7.2.2 The interdependence between convenience store chains and related actors in the development of the multiple media kiosk (MMK) service

After discussing the interdependence of the development in the online shopping with pick-up at store service the chapter goes on to describe the same issue in the multiple media kiosk service development. This service was developed by the four convenience store chains individually.

7.2.2.1 Company E

To begin with, Company E did a survey and generated the idea of developing the multiple media kiosk service. After that, it cooperated with its affiliated companies (including two IT system suppliers and Company Q) to develop the service. One IT system supplier mainly developed a POS system for Company E and the other IT system supplier developed an interface for connecting the POS system with Company E’s internal IT system. These suppliers also provided the same functional support for Company E to develop other different services. Company E authorized Company Q to create different business modules and to co-develop with two IT system suppliers. This was because Company Q had the related knowledge and capacity to develop MMK service. Company Q relied on Company E for marketing resources to support this service development.

Company Q cooperated with its service content companies to develop different business modules for the MMK service, in order to enrich their service contents and increase the turnover from this service. Company Q provided specification only to the service content companies to develop the user interface and connect the systems. The service

content companies also relied on marketing resources from Company E to promote their service and increase profit. One manager from a service content company said:

> "*Our company has a content-platform relationship with Company E and Company Q. Our company relied on marketing resources from Company E to promote our content on kiosk during some special festivals. If our service content can create profit for them, they will give our company more support next time.*"

One hardware manufacturing company provided hardware and gave a product warranty to Company E. It also discussed and shared the domain knowledge of hardware design with Company Q in order to develop the specification and prototype of the hardware. This helped Company Q to save time and cost in developing this service. Table 7.4 shows the interdependence between Company E and the related actors in the development of the multiple media kiosk service.

Table 7.4: The interdependence between Company E and related actors

Development actors	Interdependence between Company E and actors
Company Q	**High switching cost** This company is authorized by Company E to develop the MMK service. Company Q relied on marketing support from Company E
IT system suppliers	**High switching cost** These companies develop the specific function of an internal system for Company E in different service developments.
Hardware manufacturing company	**Valuable resource** The company developed hardware for Company E and provided a parts warranty. It also shared domain knowledge with Company Q, thus saving time and cost in developing the kiosk.
Service content companies	**Valuable resource** These companies enrich the service contents on kiosk by offering their high-quality service contents and helping Company Q to increase the turnover from this service.

Source: Summarized by the author

On the basis of Table 7.4, the relationship between Company E and the IT system suppliers is characterized by high switching cost, in the sense that the IT system suppliers also collaborate with Company E in other service development projects.

Consequently, the use of a proprietary IT system and interface may create a lock-in. Additionally, Company E relied on a hardware manufacturing company to develop its hardware because the supplier provide all the relevant knowledge and suggestions that Company E would need. Moreover, the interdependence between Company E and the service content companies was on the basis of valuable resources. Service content companies can use the MMK service platform to provide an additional service interface for the convenience of their consumers. They could also benefit from the marketing resources of Company E and Company Q which enabled them to promote their service contents and increase turnover. With more service content companies using the MMK service platform, convenience store chains could enrich their service contents on kiosk, thus attracting more consumers to visit to their stores.

7.2.2.2 Company F

The IT system for the MMK service was developed by Company F's existing IT system supplier, which also developed Company F's internal IT system. The IT department in Company F has the capacity to define its IT requirements and checklists, but no capacity to provide specifications and code its IT requirements. The IT system of a convenience store chain is highly customized. Thus, it is difficult for the convenience store chain to switch to another IT system supplier. In fact, by collaborating with the existing IT system supplier which fully understood the IT development process and system requirements of the convenience store chain, Company F could save time on developing new IT functions and avoid the risk of IT system instability. The IT section manager of Company F said:

> *"We outsourced IT system development to an external company. We provided them with our requirements and checklists and they gave us more detailed specifications to confirm. Finally, they developed and coded this software system based on the confirmed specifications …If our company want to change its IT system supplier, the switching cost is high because our IT system is highly customized and there are many systems also involved in it, such as a POS system."*

The IT section staff member from Company F also said:

> *"Our company relied on an IT system supplier to develop its IT system because our company has no capacity to code a program. Our company provided its system requirements and made an examination. … if it wants to change its IT system supplier, our company has a high switching cost with the IT system supplier. It is because a new IT system supplier would have to spend too much time on understanding all our IT system requirements and connections. Our company also has to take the risk of IT system instability. "*

Company F relies on a hardware manufacturing company for its provision of domain knowledge in order to confirm the specification for developing a prototype and final product. The interdependence between Company F and the service content companies was on the basis of the valuable resource which the service content companies provided. Service content companies relied on marketing support from Company F to promote their service and increase profit. In addition, Company F invited more service content companies to join this service in order to benefit consumers and support this service development. Table 7.5 shows the interdependence between Company F and the related actors in the multiple media kiosk service development.

Table 7.5: The interdependence between Company F and related actors

Development actors	Interdependence between Company F and actors
IT system supplier	**High switching cost** This company fully understands the whole IT system development of Company F. It is difficult to switch to a new company to develop its IT system because of the highly customized IT system which convenience store chains tend to have.
Hardware manufacturing company	**Valuable resource** The company provides suggestions to Company F which can save time and cost in developing the MMK service. It produces hardware for Company F and provides parts warranties.
Service content companies	**Valuable resource** These companies provide their service contents to enrich the service content on kiosk and help Company F to increase turnover to support this service development.

Source: Summarized by the author

Based on the information shown in Table 7.5, due to the highly customized IT system of the convenience store chain, the high costs of switching to a new IT system supplier and also of reconfiguring internal IT system make it difficult to change the existing IT supplier. Thus, in order to minimize or avoid the risks associated with IT system instability, Company F had to cooperate with its existing IT system supplier by giving it the requirements and checklists for developing the MMK service. Moreover, the cooperation between Company F and its hardware-providing manufacturer and service content companies can be characterised by the valuable resources committed. Company

F relied on the relevant knowledge and suggestions provided by its hardware manufacturing company with regard to the development of the MMK service. Similarly, the service content companies offered their service contents to Company F, which in turn, went on to enrich the service contents on kiosks and benefited the consumers on both sides.

7.2.2.3 Company H

Company H developed the MMK service internally and assigned a project manager to manage the progress of the development. Most of the functional developments (i.e. marketing and the IT system) had been developed within the company. With regard to the MMK service hardware development, Company H outsourced the job to a hardware manufacturing company which constructed customized kiosks according to Company H's specifications and requirements. A marketing manager from Company H said:

> *"Our company developed a software system, hardware and business modules by ourselves.… The specification of hardware was designed by our company and outsourced to hardware manufacturer to produce kiosk. …But our company relied on some of the cooperators such as banks to release their resources to develop new business modules."*

Service content companies cooperated with Company H for its marketing support, which helped promote their service contents and increase their turnover. By cooperating with the service content companies, Company H could offer more service contents on kiosk and attract more consumers to visit its convenience stores. The cooperation between Company H and the service content companies was on the basis of valuable resources. Table 7.6 shows the interdependence between Company H and the related actors in the development of the multiple media kiosk service.

Table 7.6: The interdependence between Company H and related actors

Development actors	**Interdependence between Company H and actors**
Hardware manufacturing company	**Valuable resource** The company simply produces hardware for Company H based on the specifications provided by Company H.
Service content companies	**Valuable resource** These companies ask for marketing support from Company H in order to promote their service contents and increase turnover. Company H also uses many service contents to attract visits from consumers.

Source: Summarized by the author

As seen in Table 7.6, Company H gave its requirements and specifications to the hardware manufacturer and relied on it to produce customized hardware to develop the service. Company H also cooperated with the service content companies on the basis of valuable resources, for example when Company H provided marketing resources to support the service content companies.

7.2.2.4 Company O

Company O' s partner firms (IT system suppliers and hardware manufacturing company) relied on it to provide a space in each store to place the kiosk, help them to collect the payments and promote this service. Company O did not invest much resource in developing this service and mainly relied on its partner firms to do so. The marketing manager from Company O said:

> *"Our company just provided space and staff to help consumers use this service and collect payment. Our company will not lose anything in this cooperative structure apart from goodwill, because our company did not invest any equipment in this service."*

Table 7.7 shows the interdependence between Company O and the related actors in the multiple media kiosk service development.

Table 7.7: The interdependence between Company O and the related actors

Development actors	**Interdependence between Company O and actors**
IT system suppliers	**Valuable resource** (1) These companies formed a team to develop this service and rely on Company O to promote it and collect payments from consumers. (2) Company O relied on these companies to develop this service and to help attract more consumers to visit.
Hardware manufacturing company	

Source: Summarized by the author

As seen in Table 7.7, the cooperation between Company O and its IT system suppliers and hardware manufacturing company was built on the valuable resources which each party committed to it. Company O's IT system and hardware suppliers formed a team to develop this service and they invited service content companies which wanted to offer their service contents through the kiosk. By providing a space in each convenience store

for the kiosk machines, Company O could attract more consumers' visits and increase turnover. Equally, the IT system suppliers and the hardware manufacturing company could promote the MMK service in Company O's convenience stores.

7.2.2.5 Cross-case comparison of four companies

With regard to the development of marketing for the MMK service, Companies F and H developed the marketing function in house. Company E authorized its affiliated company (Company Q) to develop a different business module and provided Company Q with marketing support. The partners of Company O mainly developed the marketing function and provided marketing resources (i.e. posters) in developing the MMK service. Moreover, because convenience store chains' IT systems are highly customized and complex, it is to switch to different IT suppliers. Thus, Companies E and F cooperated with their IT system suppliers on the basis of the high switching cost. In contrast, Company H developed the IT system for the MMK service in house. Company O totally relied on its IT system suppliers and hardware manufacturing company to develop the MMK service and to provide kiosk machines, because Company O played only a channel role in this service development. In the cooperation between convenience store chains and hardware manufacturers, the latter had to develop customized hardware for Companies E, F and H. In addition, the convenience store chains would have found it impossible and too costly to develop so many service contents individually. Thus, Companies E, F and H relied on the service content companies to provide different service contents for their kiosk, with the hope of increasing turnover and attracting more consumers into their stores. Service content companies also relied on the convenience store chains to use their marketing resources to promote their service contents. The interdependence between them was on the basis of valuable resources committed.

According to Pfeffer and Salancik (1978), the degree of dependence is determined by the number of market alternatives and high asset specification. The present study found that some service content companies have mutually dependent relationships with convenience store chains because of few market alternatives and consumers' needs, while other service content companies have asymmetrically dependent relationships with convenience store chains because of many alternatives are available. The service contents offered by the latter group of companies are less strategically important to the MMK service. For example, convenience store chains cooperated with the government,

water supplier and power suppliers to provide bill-payment services in the MMK service. These companies and institutions are oligopolists/monopolists providing services for consumers. They have more power (owing to the great number of consumers) to bargain with convenience store chains. In contrast, some service content companies (i.e. travel agencies and amusement parks) have many alternatives which provide similar services to those of the kiosk. Table 7.8 shows the interdependence between the four convenience store chains and different actors in the development of the multiple media kiosk service.

Table 7.8: The interdependence between the four convenience store chains and different actors in the multiple media kiosk service development

Development actors	**Company E**	**Company F**	**Company H**	**Company O**
Marketing	**High switching cos**t (Company Q)	**None** (Internal development)	**None** (Internal development)	**None**. This company was not involved in this function's development
IT system suppliers	**High switching cost**	**High switching cost**	**None** (Internal development)	**Valuable resource**
Hardware manufacturing company	**Valuable resource**	**Valuable resource**	**Valuable resource**	**Valuable resource**
Service content companies	**Valuable resource**	**Valuable resource**	**Valuable resource**	**None**. This company did not cooperate with them.

Source: Summarized by the author

The research finding of the MMK service development is similar to that of the development of the online shopping with pick-up at store service. Company E used vertical integration with suppliers in developing strategic functions (i.e. the IT system and marketing) by shared ownership of specific investments and resources. According to previous studies (Williamson, 1975; Harrigan, 1984), ownership can be seen as a governance to reduce the possibility of opportunism, control the progress of development and reduce the uncertainty of outcome. Company F has a high degree of interdependence with the IT system supplier because the latter developed the main IT

system for Company F. The IT system supplier totally realized the structure and requirement of Company's IT system. There was a high switching cost for the IT system supplier because convenience store chains guard the stability of their IT system. The connection between the head office of the convenience store chain and each store mainly relied on information transfer by different IT systems. Company F used a specific contract with both parent companies (a four-sided contract) and regular meetings (twice a month) to control the progress of development and combat opportunistic behavior.

7.2.3 Cross-case comparison between the two selected service developments

Comparing the interdependence between the case companies and the related actors in the two selected service developments, the interdependence between the case companies and the suppliers in developing important functions (i.e. marketing and IT) tends to be characterized by high switching cost in developing the online shopping with pick-up at store service. This is because the case companies rely on these companies to develop and execute the same functions as before (i.e. IT and logistic) in the target services. At the same time, the case companies used ownership or incentive rewards to control the progress and stability of their service development and to restrict opportunism in developing important functions (i.e. marketing, IT and logistics) of the online shopping with pick-up at store service, leading to a mutual dependent relationship being created between them. Apparently, ownership has been used across different case companies to reduce the possibility of opportunism, control development progress and reduce the uncertainty of outcome. It can also influence the process of decision-making by suppliers and in turn affect the amount of effort being put into supporting the requirements of the case companies. This is because the case companies often have recurrent interactions with these suppliers when they develop important functions in different service developments. The case companies invest in these suppliers to acquire more power in the relationship which they have with them and often outsource the functional development to support the suppliers' turnover. In addition, incentive rewards were used in the cooperation between case companies F, H, O and their IT system supplier, because this group initially tended to save costs in the development of IT systems in view of market uncertainty. The IT system supplier proposed something very advantageous (fewer investment and incentive rewards) to share the development risk and to support this group (Companies F, H, O) in competing with Company E because

this group had the same store amount in the convenience store industry. This group only invested less money in IT system development and shared a fixed percentage of profit with the IT system supplier after this service became profitable.

In contrast, the interdependence between case companies and suppliers in developing important functions (i.e. marketing and IT) is varied in the development of the MMK service. For example, some of the convenience store chains developed important functions internally, such as the marketing function developed in Companies F and H. Company E still relies on its affiliated companies to develop these functions (IT and marketing) and uses ownership to control the progress and stability of its service development, restrict opportunism and increase the dependence of affiliated companies on Company E. Previous study also suggests similar governance to reduce transaction cost when the transaction is recurrent in character, with a highly uncertain outcome (Williamson, 1985).

At the same time, case companies also have dependent relationships with a third party distribution company, an e-shop (the online shopping with pick-up at store service), a hardware manufacturing company and a service content company (the MMK service). The interdependence between them was based on valuable resources and the knowledge which suppliers provided because convenience store chains did not have adequate resources or knowledge to develop so much service content by themselves, least of all for developing the MMK service. Convenience store chains rely on service content companies providing service contents to quickly extend the scope of the services on offer in the kiosk and to increase the turnover by supporting this service development. Previous studies argued that partner firms bring dissimilar, non-redundant resources to the partnership, thus strengthening the resource base of the alliance (Hill and Hellriegel, 1994; Das and Teng, 2000). Convenience store chains cooperate with suppliers on the basis of acquiring complementary knowledge/resources, which helps convenience store chains to reduce development cost and time and increases the turnover of both sides. Moreover, the present study also found that the interdependence (asymmetrical or mutual) between case companies and suppliers varies in MMK service development in terms of the numbers of alternatives and consumers' need, in particular, case companies cooperating with service content companies.

In summary, the present study has found that case companies establish mutual dependence and cooperate closely with important suppliers in the process of new service development in order to reduce relational risks and reduce transaction cost. These important suppliers tend to be characterized by recurrent transactions and few market alternatives for the case companies. The mutual dependence between them is on the basis of high switching cost accompanied by ownership and incentive rewards. In contrast, case companies may have asymmetrically dependent relationship with suppliers in terms of a few market alternatives or non-strategic suppliers to contribute new service development. These suppliers often actively put more effort into striving to cooperate with case companies in order to increase turnover from cooperation and raise their visibility to consumers. Case companies can save the time and cost of establishing coordination and control mechanisms with these suppliers and choose a better deal for their cooperation.

7.3 The relationship between interdependence and the speed of new service development in two selected services.

This section explores the relationship between the interdependence and the speed of new service development in the two selected services (the online shopping with pick-up at store service and the multiple media kiosk service).

7.3.1 Online shopping with pick-up at store service

There was some evidence from the interviews which suggested that the mutual dependence between convenience store chains and their suppliers influences the speed of new service development. Suppliers of convenience store chains provided specific assets (knowledge and resources) in order to develop important functions (i.e. IT and logistic functions) for the online shopping with pick-up at store service. Moreover, convenience store chains use vertical integration and hold majority ownership in supplier firms to strengthen their relationships and influence the suppliers' decision-making. In other words, the suppliers to some extent depend on convenience store chains for finance. Thus they would be more willing to make more effort to meet the requirements of the convenience store chains. In addition, they also provided the same functional support to convenience store chains in developing different services. Along with the experience of collaboration in other service developments, the

interdependence between convenience store chains and their suppliers reduces the uncertainties involved in new service development. For instance, in Company E, the speed of new service development was greater because its suppliers fully supported the functional development of the IT system. The previous manager of Company E's IT system supplier stated:

> *"This service development was an objective of Company E… the new service development was faster because we have to fully support this service development in the IT system function. The fact is that our company is a specific supplier which provides Company E with parts of its internal IT system development. Company E has the majority ownership of our company. "*

The same phenomenon was found in another group of companies (Companies F, H and O). Convenience store chains rely on their suppliers to coordinate with other convenience store chains and save costs by joint purchasing. Convenience store chains also used shared ownership in the process of service development to influence their suppliers' decisions. Suppliers also relied on integrating different convenience store chains to strengthen their collective bargaining power in order to negotiate with e-shops and withstand the competition of other group. Suppliers are willing to provide full support to fulfil the requirements of the convenience store chains. Convenience store chains are also willing to provide their suppliers with the essential resources to develop new services. The mutually interdependent relationship between them can shorten time-to-market in a new service development. One member of the marketing staff from Company F said:

> *"New service development moves faster; in terms of our company, we have a mutually interdependent relationship with Company C. This is because our company relies on Company C as a platform to coordinate with the other convenience store chains in developing this service and providing it in their stores. Company C also counts on our company's support with essential resources. It did its best to support our company when it developed services and made the needs of our company its priority."*

In short, this research found that a high degree of interdependence between firms may speed up the development of new services. In the project of to introduce the online shopping with pick-up at store service, suppliers provided specific knowledge and resources to support strategic functional developments in the convenience store chains. Due to the high switching cost, convenience store chains were dependent on their suppliers, in particular in developing the fundamental functions (i.e. IT, logistics and marketing) to implement the new service. Equally, these suppliers were dependent on

the convenience store chains for their sales. To minimise the risk of opportunistic behaviour on the part of suppliers, the convenience store chains vertically integrated them by using majority ownership, as seen in the case of Company E. Company E used its shared ownership to influence the suppliers' development schedule and their efforts to bring about the new service development. In contrast, Companies F, H, O used incentive rewards to cooperate with their IT system supplier in this service. The IT system supplier had the motivation to fully support IT system development, because it could share the profit in due time.

When convenience store chains and suppliers are dependent on each other for resources to achieve their strategic goals, having much to lose by being non-cooperative, they are less likely to engage in opportunistic behaviour. Suppliers would do their best to support the convenience store chains in developing new services. Thus, the mutual dependence between the convenience store chains and the suppliers may eventually develop norms for managing cooperation, which in turn can reduce the transaction costs of developing new services. Previous studies argue that mutual dependence between firms will contribute to strengthened motivation to cooperate, restricted opportunistic behaviour and enhanced knowledge sharing in transactions (Lusch and Brown, 1996). The present study found empirical evidence that mutual dependence between firms can speed up the new service developments because of the benefits of mutual dependence (including: enhancing knowledge sharing and motivation to cooperate and limited opportunism) listed in previous studies.

7.3.2 Multiple media kiosk (MMK) service

As regards the multiple media kiosk service development, this research found that different dependent relationships between firms (asymmetrical or mutual) can influence the speed of new service development. Convenience store chains have a high degree of dependence (high switching cost) with suppliers in developing IT systems or marketing functions, except in the cases of Companies H and O. Convenience store chains also use majority ownership and a high dependency on sales (via marketing support) to limit the opportunistic behaviour of suppliers, which also leads to mutual dependence between firms. For example, Company E relied on Company Q (Company E's marketing company) to cooperate with different service content companies and develop different business modules on kiosk. In terms of Company Q's high dependency for its sales on

Company E, Company Q had to arrange a development schedule and resource allocation to fit the requirements (mainly focused on a marketing plan and promotion) of Company E. Company Q tended to make more effort with some of the business modules to make them fit the marketing plan and the promotion by Company E, leading to a reduced time-to-market for the new business module. A project manager from Company Q said:

> *"Our company needs Company E's marketing resources to promote a new business module. If the new business module can fit in with the marketing plan of Company E, the speed of the new service development will increase. If there is a scheduled conflict in the development of the new business module between our company and Company E, our company has to follow Company E's requirements. This may slow down the time-to-market of new business module."*

In addition, the interdependence between the convenience store chains and the service content companies was on the basis of the valuable resources committed. Convenience store chains provided marketing resources to promote the service contents on kiosk. Some resources provided by the service content companies are considered valuable because there were few market alternatives and consumers needed them. For example, Company E and F cooperated with banks to transform the bill payment service in the kiosk because this service was convenient for the consumers. Consequently, if convenience store chains can provide this service in their stores, they attract more consumers and increase turnover. In such a mutually dependent relationship, service content companies would have to put more resources to develop service contents that match the needs and convenience of convenience store customers. In addition, convenience store chains also provide marketing and IT support to these service content companies, in order to shorten the time-to-market. A manager from one of the service content companies said:

> *"Our service content can attract many consumers to use and create a big profit in a specific period. There are few companies that can provide the same service content. In terms of time constraint, the convenience store chain shared its resources to support and promote our service content on kiosk. The new service developed more quickly."*

The present research found that the relationship between them was more likely to be mutually dependent if the convenience store chains were dependent on important suppliers to contribute valuable resources. From the suppliers' point of view, there are few alternative convenience store chains to which they can turn. Previous research has

argued that the mutual dependence of firms can reduce the degree of uncertainty in transaction outcomes (Gao *et al*., 2005). In addition, some researchers propose that complementary resource alignment contributes positively to a better performing alliance because, according to the resource-based view, partner firms bring unique and valuable resources to strengthen the resource base of the alliance (Olk, 1997; Das and Teng, 2000). The present research found that mutual dependence between firms could reduce the time required for developing the MMK service.

However, some service content companies may have asymmetrical dependent relationships with the convenience store chains because of a few market alternatives existed. Some of the service contents tend to be provided by a few market alternatives. Convenience store chains, in contrast, can easily choose alternatives which can quickly provide new business modules for the kiosk and fit their marketing plan. From the suppliers' point of view, service content companies also rely on the marketing support from the convenience store chains to promote new business modules and increase turnover for the kiosk. They would put more effort into follow the schedules set by the convenience store chains and would accelerate their development schedules. A project manager from a service content company said:

> *"If our service content fits in their marketing plan, our company will develop this service content quickly with the support of marketing resources from Company E to promote our service content on kiosk."*

Previous studies have concluded that suppliers improve the development process and specifications in order to fit the requirements of the buyer when they are highly dependent on the buyer for their own sales (Haile´n et al., 1991; Carr et al., 2008). Some of the service content companies have an asymmetrical dependent relationship with convenience store chains because a few alternatives can provide a similar service content. From the point of view of the convenience store chains, they can choose suppliers which can adapt to their marketing plan and accompany the introduction of new business module. From the suppliers' point of view, the service content companies have to make more effort to speed up their schedules in order to earn the marketing support to promote new service contents on kiosk and increase their turnover from the MMK service. The asymmetrical dependent relationship between convenience store chains and suppliers may thus speed up new service developments. Suppliers have to improve their specifications or speed up their development schedules to fit the

requirements of the convenience store chains because the latter can easily choose potential suppliers which fit their development schedule.

7.3.3 Cross-case comparison between two selected services in the relationship between interdependence and the speed of new service development

According to the above discussion, the relationship between interdependence and the speed of new service development is influenced by the symmetry of the dependent relationship (asymmetrical or mutual) between firms. Case companies are often mutually dependent on their suppliers in developing important functions (i.e. IT, marketing and logistics) of two service developments, in particular the development of the online shopping with pick-up at store service. Generally, case companies have dependent relationships with these suppliers on the basis of high switching cost because case companies often rely on these suppliers to develop specific functions in different services. In order to reduce the opportunistic behaviour of suppliers and control quality and progress of the service, case companies may use majority ownership to govern these suppliers, which leads to reduced transaction cost and establishes mutual dependence between them. It can also influence the suppliers' decisions to make more effort to comply with the requirements given by the case companies and speed up new service developments. However, case companies have adopted majority ownership to strengthen their interdependence with the suppliers and give them a great sales volume which makes them financially affiliated. This may cause a problem of limited competitive pressure for suppliers, which leads to suppliers' being less motivated to continuously improve their domain capabilities and operation procedures. Thus, case companies often use the development opportunities of different new services to force these suppliers to improve their capabilities and operating procedures. In contrast, the relationship between the case companies and the strategic suppliers (i.e. for IT and functions) in MMK service development presents different degrees of dependence. Some of the case companies, such as Company E, still have a dependent relationship with their suppliers on the basis of high switching cost and control through the suppliers' ownership. The mutual dependence between them can reduce opportunism and control the progress of development, leading to a quicker development of new services. Some case companies (e.g. Company H) developed these functions internally without any dependence on suppliers.

Moreover, case companies have different degrees of dependence (asymmetrical or mutual) with some suppliers, including third party distribution companies and e-shops (with regard to the online shopping with pick-up at store service) and with hardware manufacturing companies and service content companies (with regard to the MMK service). The interdependence between case companies and these suppliers is mainly based on valuable resources. These suppliers may create a mutual dependence with case companies on the basis of the shortage of market alternatives and consumers' needs. They also rely on case companies to provide essential resources and increase turnover. For example, case companies rely on the service content companies to provide service content to enrich this platform and increase turnover. The service content companies may create mutual dependence with the convenience store chains on the basis of the scarcity of alternatives and consumer's needs. When the case companies have a mutual dependent relationship with the service content companies, the former provide marketing support to the service content companies in developing new service modules. The service content companies also make more effort to develop new service modules on kiosk. Mutual dependence between case companies and their suppliers can strengthen the motivation to cooperate and share the valuable resources/knowledge so as to reduce the time required for new service development. Although previous studies have argued that mutual dependence between firms can enhance knowledge sharing between them and lower the degree of uncertainty in transaction outcomes (Lusch and Brown, 1996; Gao *et al*., 2005), the present study found evidence that a firm which has a mutual relationship with its suppliers can shorten the time required for developing new services.

Moreover, the present study also found that the time required for new service developments in MMK service development may go down in an asymmetrically dependent relationship between case companies and suppliers. For example, some of the service content companies have asymmetrically dependent relationship with the convenience store chains given their scarcity and the less essential nature of the resources offered in developing a new business module. These suppliers also rely on marketing support from case companies to promote new business modules on kiosk and increase the turnover from the MMK service. Further, they also use the cooperation with case companies to promote their reputation in the companies' domain. Previous studies have argued that suppliers are willing to improve their production process and

specifications in order to meet a buyer's requirements when the supplier is highly dependent on the buyer for sales volume (Haile´n et al., 1991; Carr et al., 2008). Further investigating the relationship between dependence and performance outcome in product/service development, Takeishi (2001) has found that suppliers' sales greatly depend on a buyer whose outcome performs well (design quality). The present study further found empirical evidence that a firm with an asymmetrically dependent relationship with suppliers (where the supplier has high dependency on a firm's resources) tends to speed up the new service developments because the supplier is willing to share the related knowledge and accelerate its development schedule to meet its partner's requirements in order to acquire essential resources from this partner, whereby it promotes its reputation in the partner's domain and increases turnover.

7.4 The trust between convenience store chains and related actors in the two selected service developments

This section begins by identifying the three types of trust that convenience store chains have with different actors in the two selected service developments.

7.4.1 The trust between convenience store chains and related actors in the development of the online shopping with pick-up at store service

7.4.1.1 Company E

Company E has long-term experience of cooperation with a distribution company (Company W) and its IT system suppliers because these companies cooperated with Company E to develop different services and provided the same functional development. As noted above, in the second stage of developing the online shopping with pick-up at store service, Company P (a marketing company) was set up by Company E to take over the responsibility for developing the service. The trust between Company E and Company P was on the basis of inter-personal trust, because Company E's former team members who fully understood the process of service development went on to work at Company P. Company E also shared its related knowledge with Company P and its group company and discussed problem-solving when it developed new functions for developing the online shopping with pick-up at store service. Moreover, Company P selected its applied IT system suppliers on the basis of the firm's capability and reputation in its domain.

Company E did not solely count on third party distribution companies to perform delivery service because its own distribution system could provide the same service. This implies that Company E's self-owned distribution company had a potentially competitive relationship with the third party distribution companies. Therefore, the trust between Company E and third party distribution companies was on the basis of the partners' capability and reputation.

The trust between the e-shops and Company E was contractually-based trust. Company P used formal contracts with the e-shops to make sure that the product quality and delivery routine which the e-shops provided the consumer's satisfaction and protected the goodwill of Company E. A marketing manager from Company P said:

> "*There are some considerations in the partner selection process when our company wants to develop a new service. For an external company, the first one is the potential company's previous performance, product types, whether the product is legal or illegal and the goodwill. …The second one is the company's system capacity which hinges on whether the company can achieve what it has promised.*"

The trust between Company E and the related actors is summarized in Table 7.9.

Table 7.9: The trust between Company E and the related actors

Development actors	Trust between Company E and actors
Distribution company- Company W	**Goodwill trust** This company has a long-term experience of cooperation with Company E to provide logistic functions in different services.
IT system suppliers	**Goodwill trust** This company has long-term experience of cooperation with Company E to develop internal IT systems.
Third party distribution companies	**Competence trust** The trust between Company P and third party distribution company is on the basis of capability and reputation in its domain.
E-shops	**Contractual trust** They follow the contract terms given by Company E or third party distribution in order to use this service platform and benefit the online shopping consumers.
Marketing- Company P (second stage)	**Goodwill trust** This company was established to develop related e-commerce services and take over this service

	development. This company also discusses and shares related information with Company E and its IT system suppliers when it develops new service functions.
Applied IT system suppliers (second stage)	**Competence trust** These companies are selected on the basis of capability and reputation in their domain.

Source: Summarized by the author

Based on the above illustration, Company E had long-term experience of cooperation with suppliers in different functions (i.e. logistics and IT) because these suppliers developed the same functions in different services. Inter-personal trust underpinned its cooperation with a marketing company (Company P), because some of Company E's former employees, who fully understood the development process, were working at Company P. Company P cooperated with the suppliers of the applied IT system on the basis of the suppliers' capability and reputation in their domain. These companies were very capable and had much experience of developing specific IT systems. The cooperation between Company E or Company P and the e-shops is on the basis of formal contracts because Company E or Company P use only contract terms to control the e-shops' product quality and delivery routine.

7.4.1.2 Companies F, H, O

Regarding the trust between Companies F, H, O and the related actors in the online shopping with pick-up at store service development, Companies F, H, O have long-term relationships with the distribution companies owned by the convenience store chains. These distribution companies helped the convenience store chains to deliver goods for different services at each convenience store. Companies F, H and O cooperated with a marketing company (Company C), based on joint decision making and specific problem solving. Company C was willing to share its essential resources/knowledge and discuss problems with Companies F, H and O.

The trust between Companies F, H and O and their IT system supplier was on the basis of risk-sharing. The IT system supplier invested a great deal of money and resources to develop the IT system without any service charge, whereas Company C provided only a server during the development of the IT system. The previous manager of the IT system supplier, said:

> *"Our company proposed a cooperative project with Company C and used risk sharing to develop this IT system ... Our company proposed risk sharing which means that our company charged a fixed rate of profit after this service became profitable. It required less money in Company C's investment to develop this IT system. Our company developed the IT system without charge."*

One of the third party distribution companies with which Companies F, H, O collaborated was the first company to cooperate with Company C. In addition, it provided a total logistic solution (store, packing and delivery) to the e-shops in this service development when the earlier distribution company stopped delivering goods from the e-shops to the distribution companies of the convenience stores. After one manager from a third party distribution company moved to the other third party distribution company, Company C began to cooperate with this new third party distribution company because they had previous experience of cooperation between individuals. Company C also cooperated with the other third party distribution company because it had been the first company to cooperate with Company E to develop this service. The firm's reputation and capability underpinned the cooperation between Companies F, H, O and the third party distribution company. A manager from one of the third party distribution companies said:

> *"Our company cooperated with Company C on the basis of previous cooperative experience with this company when I worked for a previous company. It was also based on our company's capability to provide a logistics service to the e-shops."*

The trust between the e-shops and Company C was on the basis of contractual trust. Company C defined clear terms in its contract with the e-shops to control product quality and delivery routine. Table 7.10 shows the trust between Companies F, H, O and the related actors.

Table 7.10: The trust between Companies F, H, O and related actors

Development actors	Trust between Companies F, H, O and actors
Company C	**Goodwill trust** This company is willing to share valuable information to convenience store chains and discuss with them and the related actors in order to develop this service.
Distribution companies	**Goodwill trust** These companies had a long-term collaboration with the convenience store chains to provide logistics

	services in different service operations.
IT system supplier	**Goodwill trust** This company is willing to share the development risk with Company C in developing the IT system for this service.
Third party distribution companies	**Competence trust** They have a good reputation and the capability to provide a logistics service (including storing, packing and delivering).
E-shops	**Contractual trust** They follow the contract terms set by Company F, H, O or third party distributors in order to use this service platform and benefit the online shopping consumers.

Source: Summarized by the author

As shown in Table 7.10, goodwill trust emerged through the long-term cooperative experience shared by Companies F, H and O and their own distribution companies. These distribution companies also provided various delivery services to the respective convenience store chains. Companies F, H and O cooperated with Company C on the basis of joint decision-making and problem solving. Companies F, H and O also influenced the development direction, making suggestions and offering solutions when Company C had development problems with this service. The collaboration between this group and an IT system supplier was based on shared development risk and related knowledge. Similarly, the cooperation between the e-shops and the convenience store chains was underpinned by a formal contract which could be used by Company C to control product quality and save monitoring costs.

7.4.1.3 Cross-case comparison between two groups

Company E had long-term experience of cooperating with suppliers in developing IT and logistics functions. Company E cooperated with the suppliers of the chosen IT system based on their previous interactions and the capability of the suppliers. Similarly, Companies F, H and O had long-term experience of cooperation with their respective distribution companies. These distribution companies helped the convenience store chains to deliver goods to each convenience store in connection with different services. The convenience store chains understood their suppliers' capability and behaviour, on the basis of their previous cooperation. Consequently, this not only increased the predictability of the suppliers' behaviour but also lowered the transaction costs (Zaheer

et al., 1998). Moreover, the trust between the e-shops and the two other groups was underpinned by the terms of the contract because the two groups had to unify their service process and control its quality. Contracts were considered a suitable means of governing the transactions between the e-shops and the two groups because of the larger number of alternatives available and the nonspecific asset involved (Williamson, 1985). Furthermore, the completed contract comprises more legally specific clauses, which can be easily used to interpret and enforce the terms with partners in a transaction (Woolthuis et al., 2005). A contract can be seen as a source of trust, which restricts opportunistic behaviour and leads to reduces transaction costs.

The main difference between Company E and Companies F, H and O concern the trust which they had in the third party distribution companies. Company E did not count on third party distribution companies to perform its delivery service, because its own distribution system could provide the same service. This may have increased the possibility of goal conflict between firms and led to a rise in transaction costs (Gulati, 1995). In contrast, Companies F, H and O cooperated with the third party distribution companies on the basis of their good capability and reputation in their domains. The established inter-personal trust was on the basis of previous experience of cooperation, which is an important source of trust between firms. For example, Company C (marketing) chose to cooperate with a new distribution company because the former manager of the third party distribution company moved to a new post in the new distribution company. The cooperation between Company E and the marketing company (Company P) was also on the basis of inter-personal trust. When an individual in a focal firm has previous experience of cooperation with his equivalent in a partner firm, it can increase the predictability of the cooperating individuals' behaviour and capability. Both individuals in the partner firms can focus on developing solutions in the process of developing the new service rather than on doubts about individuals' personalities and capabilities.

In addition, Companies F, H and O cooperated with an IT system supplier on the basis of the shared development risk. When the supplier invests more resources in shared development with risks it leads to a lower possibility of opportunistic behaviour on the part of the supplier (Gulati, 1995; Zaheer et al., 1998). Table 7.11 sets out the areas of trust between the two groups and their related actors in developing the online shopping

with pick-up at store service.

Table 7.11: The trust between two groups and their related actors in the online shopping with pick-up at store service development

Development actors	Company E	Companies F, H and O
Self-owned distribution company	**Goodwill trust** (long-term experience of cooperation)	**Goodwill trust** (long-term experience of cooperation)
IT system supplier	**Goodwill trust** (long-term experience of cooperation)	**Goodwill trust** (shared development risk)
Third party distribution company	**Competence trust** (good reputation and capability)	**Competence trust** (good reputation and capability)
E-shops	**Contractual trust** (contract terms)	**Contractual trust** (contract terms)
Marketing company	**Goodwill trust** (long-term experience of cooperation)	**Goodwill trust** (joint decision making and problem solving)

Source: Summarized by the author

7.4.2 The trust between convenience store chains and related actors in the development of the multiple media kiosk (MMK) service

After discussing the trust in the online shopping with pick-up at store service development, the section goes on to discuss the trust in the development of the multiple media kiosk service.

7.4.2.1 Company E

Company E had long-term experience of cooperation with suppliers in developing IT and marketing functions. The IT system suppliers often provided the specific functions to Company E in different services. Company Q was authorized to develop the MMK service, including enriching different business modules for the kiosks and providing hardware installation, because it was already cooperating with Company E to develop a "mobile office" service which could be easily transferred to the kiosk. Moreover, Company Q also had experience of IT system integration and hardware development. The project manager from Company Q said:

> "*Company E authorized this service development to Company Q on the basis of previous cooperative experience because our company had experience of cooperation with Company E to develop a photocopy machine service…In addition, our company previously focused on IT system integration and had good experience in hardware development.*"

Company Q cooperated with a hardware manufacturing company on the basis of its reputation and technological capability. This hardware manufacturer is a listed company in Taiwan and impeccable financial and operation reports. It also has a good capability to provide customers with flexible solutions (highly customized) for developing the kiosks. A manager from the hardware manufacturing company said:

> *"Our company has the technological capability to design and produce kiosk. Our company can provide a customized service (flexible) on the basis of customer demand and can use a module design (printer, panel and card reader). Furthermore, our company is a listed company which has transparent financial and operation reports."*

Company E and Company Q cooperated with the service content companies on the basis of their capability and reputation in their domains. The previous experience of cooperation was also an important factor in the partner's selection and trust. This is because some of the existing services were to be prioritized for transformation into a new client interface (the kiosk) in order to enrich the kiosks' service content. A manager from one of the service content companies said:

> *"When Company Q looks for online fortune service, it emphasizes brand image. Our brand image is very clear and famous, with established brand value. With regard to the trust between our company and Company Q, our company had experience of cooperating with the staff who worked for the previous company. We know each other. When the staff worked for Company Q, it was thought that our company could provide our service content on kiosk."*

Table 7.12 shows the trust between Company E and the related actors in the development of the multiple media kiosk service.

Table 7.12: The trust between Company E and the related actors

Development actors	Trust between Company E and actors
Company Q	**Goodwill trust** Company E authorized this company to develop the MMK service. This company already has experience of cooperating with Company E to develop a "mobile office service".
IT system suppliers	**Goodwill trust** This company has long-term experience of cooperation with Company E to provide IT system development. It also shares domain knowledge with Company E and group companies in developing this service.
Hardware manufacturing	**Competence trust**

company	This company has good capability and reputation in developing kiosk. It is also a listed company in Taiwan.
Service content companies	**Competence trust/ Goodwill trust** Company Q cooperates with the service content companies on the basis of their capability and reputation in their domains. Some of the service content companies are selected on the basis of their existing experience of cooperation with Company E.

Source: Summarized by the author

Based on Table 7.12, Company E cooperated with suppliers on the basis of their previous cooperative experiences in developing marketing and IT system functions. The cooperation between Company E and the hardware manufacturing company in developing the MMK service was on the basis of reputation and capability. Finally, Company Q and Company E, when they developed new business modules for the kiosks, cooperated with the service content companies on the basis of their capability and reputation in their domains. Some of the service content companies were chosen to provide their services on kiosk on the basis of the existing cooperation with Company E.

7.4.2.2 Company F

Company F had a long-term cooperative relationship with an IT system supplier. This company was willing to share the related knowledge to facilitate trust building between itself and the IT system supplier in developing new services. It also provided a training course for Company F's IT staff in order to promote their technological capability. The IT section manager of Company F said:

> *"The IT system supplier provided a training course to our department staff in order to transfer some related knowledge and augment our department staff's capability. Our company also has regular interaction with this company to identify project requirements and discuss potential problems."*

Company F cooperated with a hardware manufacturing company on the basis of its good reputation, capability and experience in this domain. This hardware manufacturer was fully capable of developing a software system and hardware in developing the kiosks. In addition, it also had good experience of cooperating with a leading bank to provide the ATM in the kiosks and win a major market share in the financial industry. An assistant manager of the hardware manufacturing company said:

> *"Our company is an equipment provider. Our company has the capability to design and produce the kiosks. Our company also has the capability to develop an IT system. The good experience in this domain is that our company combined the characteristic of financial transfer and retailing to provide this service. Our company also has a service team to help our consumers …Our company has good cooperative experience with a Taiwanese banking leader which provided and placed ATMs in the convenience stores."*

Finally, Company F cooperated with the service content companies on the basis of their capability and reputation in their domains when Company F developed a new business module on kiosk. The existing experience of cooperation is also an important factor in the cooperation between Company F and some of the service content companies because Company F identified the full extent of the partners' capability and performed well in their existing cooperation. One member of the marketing section staff from Company F said:

> *"When our company selected the service content companies, our considerations focused on each firm's capability and reputation in this domain and its previous cooperative experience, depending on whether the service content company was already cooperating with our company… The capability and reputation of the service content company was an important factor in first persuading our company to cooperate with it. "*

Table 7.13 shows the trust between Company F and the related actors in the multiple media kiosk service development.

Table 7.13: The trust between Company F and related actors

Development actors	Trust between Company F and actors
IT system supplier	**Goodwill trust** This company has regular interaction with Company F for facilitating trust building between them. It also has the intention to share valuable knowledge and provide a training course for Company's IT staff in order to promote their domain knowledge and capability.
Hardware manufacturing company	**Competence trust** This company has good capability and much experience of providing hardware in retailing.
Service content companies	**Competence trust/ Goodwill trust** Company F cooperated with the service content companies on the basis of their capability and reputation in their domains. Some of the service content companies were selected on the basis of the existing experience of cooperation with Company F.

Source: Summarized by the author

Company F, then, had long-term experience of cooperation with its IT system supplier in developing a customized IT system. The IT system supplier company was also willing to share its related knowledge and provide training courses for the staff of the IT department in Company F. Regarding the collaborations between Company F and the hardware manufacturing company, manufacturers' good reputation and capability were the main determinants of Company F's decisions in selecting suppliers. Finally, the cooperation between Company F and the service content companies was on the basis of their previous experience of cooperation, when relevant. Moreover, the partner's capability and reputation in its domain would be important concerns when Company F first chose to cooperate with the service content companies in developing new business modules for the kiosk.

7.4.2.3 Company H

Moving to the trust between Company H and its related actors, Company H cooperated with its hardware manufacturing company on the basis of its previous cooperative experience. This hardware manufacturer had previously developed the hardware of a POS system for Company H. Company H identified the full extent of the partner's capability in developing hardware on the basis of its previous experience of their cooperation. Moreover, when Company H developed a new business module for the kiosks the cooperation between Company H and service content companies was on the basis of the partner's capability and reputation in its domain. Company H also cooperated with its existing partners to transform the existing service contents on kiosk in order to enrich their service contents and improve the operating procedure of the service content already in place. A manager from Company H said:

> *"When our company looked for the first cooperator in each business module, our company had to find a leading company after it had assessed its capability and reputation … After this business module become mature, our company began to cooperate with medium or small companies. The first cooperator in each business module must have good capability and experience in its domain."*

A manager from one of the service content companies stated:

> *"Unlike other ticket sale companies focusing on business performance, such as tickets for concerts and baseball games, our company is one of the leading companies to provide a ticket sale system for art exhibitions."*

Table 7.14 shows the trust between Company H and the related actors in the development of the multiple media kiosk service.

Table 7.14: The trust between Company H and related actors

Development actors	Trust between Companies H and actors
Hardware manufacturing company	**Goodwill trust** This company has previous experience of cooperation with Company H to provide other hardware for use in a POS system.
Service content companies	**Competence trust/ Goodwill trust** Company H cooperates with the service content companies on the basis of their capability and reputation in their domains. Some of the service content companies are selected on the basis of their existing experience of cooperation with Company H.

Source: Summarized by the author

Thus, Company H cooperated with its hardware manufacturing company on the basis of previous cooperative experience, since the hardware manufacturing company had previously developed the hardware of its POS system. The trust between Company H and the service content companies in developing a new business module was on the basis of the partner's reputation and capability in its domain. In addition, Company H also cooperated with its partners to provide their service content on kiosk on the basis of their existing experience of cooperation.

7.4.2.4 Company O

The trust between Company O and its related actors was on the basis of partner's capability and reputation in its domain. The IT system suppliers and hardware manufacturing company formed a team to develop the MMK service. These companies had good capability and experience in each domain. For instance, the hardware manufacturing company is a multinational company with the right capability and experience for developing kiosk for the retail and finance industries. One of the IT system suppliers which provided IT system integration was a listed company in Taiwan. Its reputation lay in its open, transparent financial reports. A manager from Company O said:

> "*When they (the IT system suppliers and the hardware manufacturing company) proposed this project to our company, it saw them as a strong team because one*

of the companies is a listed company and one of the other two is an international company which has good capability and experience in hardware and software development."

Table 7.15 shows the trust between Company O and the related actors in the development of the multiple media kiosk service.

Table 7.15: The trust between Company O and related actors

Development actors	Trust between Company O and actors
IT system suppliers	**Competence trust** These companies have a good reputation and capability in this domain. One of them is a listed company in Taiwan for providing IT system integration.
Hardware manufacturing company	**Competence trust** This company also has good capability in developing kiosks in retail outlets.

Source: Summarized by the author

The above table shows that the collaborations between Company O and its IT system suppliers and hardware manufacturing company were underpinned by the suppliers' reputation and capability in their domains. These suppliers had good experience and capability in developing kiosk systems.

7.4.2.5 Cross-case comparison among four companies

The cooperation between Company E and its group companies was on the basis of previous cooperative experiences and the suppliers' capability in developing marketing and IT system functions. Similarly, the cooperation between Company F and its IT system supplier was also on the basis of a long-term experience of cooperation. The IT supplier company shared the related knowledge and provided training courses to the staff of the IT department in Company F. However, the collaborations between Company O and its IT system suppliers were underpinned by the partners' reputation and capability in their domains. The MMK service is highly dependent for the quality and efficiency of the IT system and connection. Building on the success of previous collaborations with suppliers in other service developments Convenience store chains thus had more confidence in the continuous cooperation with suppliers in developing the MMK service. With more predictable behaviour, they could trust these suppliers to provide reliable functional support (Gulati, 1995; Zaheer et al., 1998).

Regarding the collaborations between Companies E, F and O and their respective hardware manufacturing companies, the manufacturers' good reputation and capability were the main determinants in partner selection. In contrast, the trust between Company H and its hardware manufacturing company was mainly on the basis of previous cooperative experience in developing hardware for use in a POS system. Moreover, Companies E, F and H cooperated with the service content companies on the basis of their previous experience of cooperation and its partners' reputation and capacity in their domains. This is because some of the business modules already developed in the cooperation between the convenience store chains and the partner firms could be simply transferred to the new client interface (the kiosks). Previous studies suggest that trust between firms emerges on the basis of successfully completed transactions and the perceived fairness of partners' actions (Ring and Van de Ven, 1992; Parkhe, 1993; Young-Ybarra and Wiersema, 1999). In the process of developing trust previous experience of cooperation between firms increases the predictability of supplier's behaviour (Lewicki and Bunker, 1995). Moreover, some of the service content companies tend to be evaluated by their reputation and capacity in their domains because there are few market alternatives for their service content. Company O did not cooperate with the service content companies because it played only a channel role in this service development. The supplier's good capability in its domain helps transform the uncertainty of a focal firm into certainty (Kale, 1991). A supplier which shows good capacity in its domain can help a focal firm to reduce its market and technological uncertainties in the process of developing a new service which the focal firm lacks the related knowledge and resources to do alone. These factors (the existing experience of cooperation and a supplier's good reputation and capability) can help develop trust between firms and keep transaction cost down Table 7.16 shows the trust between four convenience store chains and different actors in the multiple media kiosk service development.

Table 7.16: The trust between four convenience store chains and different actors in the development of the multiple media kiosk service

Development actors	Company E	Company F	Company H	Company O
Marketing company	**Goodwill trust** (existing experience of cooperation)	**None** (Internal development)	**None** (Internal development)	**None**. This company did not engage in developing this function
IT system supplier	**Goodwill trust** (long-term experience of cooperation)	**Goodwill trust** (long-term experience of cooperation and knowledge sharing)	**None** (Internal development)	**Competence trust** (partner's reputation and capacity)
Hardware manufacturing company	**Competence trust** (partner's reputation and capability)	**Competence trust** (partner's reputation and capability)	**Goodwill trust** (previous experience of cooperation)	**Competence trust** (partner's reputation and capability)
Service content companies	**Goodwill trust** (previous experience of cooperation); or **Competence trust** (partner's reputation and capability)	**Goodwill trust** (previous experience of cooperation); or **Competence trust** (partner's reputation and capability)	**Goodwill trust** (previous experience of cooperation); or **Competence trust** (partner's reputation and capability)	**None**. This company did not cooperate with them.

Source: Summarized by the author

7.4.3 Cross-case comparison between two selected service developments

On the basis of the above evidence and discussion, the present research found that the trust between case companies and their suppliers mainly builds on their previous experience of cooperation and the suppliers' capacity in the development in both the services under review. Case companies often cooperate with the same suppliers to develop specific functions in different service development projects. Often these suppliers fully understand the case companies' development routines and requirements and in this way they reduce the cost of communication and increase the predictability of behaviour by the case companies. Case companies have also recognized and understood the suppliers' capability on the basis of their long-term experience of cooperation, which lowers the cost of searching and monitoring. The trust between firms leads to

lower transaction cost because it reduces the transaction costs and the possibility of opportunism and increases the predictability of their partners' behaviour (Zaheer et al., 1998). However, because companies tend to cooperate with the same suppliers in the development of specific functions, the degree of trust between them can be strengthened; but this may cause a further problem of the limited pool of expertise to contribute to innovation outcomes. Thus, case companies put more effort into the process of supplier selection and assess the capabilities of their current and potential suppliers in order to identify which will best contribute to further service developments, unless some specific functions re at stake, such as main IT systems when there is a high switching cost. Suppliers with good capabilities in their domain can help case companies to identify possible problems and reduce the uncertainty of development tasks.

Moreover, inter-personal trust is also the foundation of the trust built between firms, in particular in the development of the online shopping with pick-up at store service. Interpersonal trust is based on the previous experience of the staff in both firms of working together. Both sets of staff understand the capability and behaviour of each other through their previous experience of cooperation, leading to an increase in the predictability and reliability of the partners' behaviour in a new project development. The trust built between partners also reduces the difficulty of negotiation in the development process because each partner believes that the information provided by the other is not a misrepresentation.

The main difference between the two service developments with regard to the trust between the case companies and the suppliers (i.e. the e-shop and service content company) lies in the uncertainty. Case companies cooperated with different fundamental suppliers in developing IT or logistic functions in order to provide a platform for the non-fundamental suppliers to market their goods and services. In the online shopping with pick-up at store service, the trust between the case companies and the e-shops was based on the terms of the contract. Case companies simply provided a unified contract to manage the e-shops, to control the service quality which the e-shops provided and to protect the case company's goodwill, because the transaction between the case companies and the e-shops was based on the nonspecific assets involved. Thus, contracts are appropriate ways for case companies to manage and govern their collaboration with e-shops and to reduce transaction cost and risk.

In contrast, the trust between the case companies and the service content companies in the development of the MMK service built on their previous experience of cooperation between firms. The case companies cooperated with their existing partners and transformed the existing service content for the kiosks because they had a previous history of collaboration and understood each other's capacity. According to previous studies, the earlier cooperation between firms, thus, increased the predictability of the supplier's behaviour and reduced transaction cost (Lewicki and Bunker, 1995). Previous experience of cooperation between firms can make it easier for each partner's behaviour in a new development to become predictable and thus can reduce monitoring cost. Moreover, supplier firms' capability is another important factor in building trust when case companies choose which service content company to collaborate with on the development of a new module. Previous studies argued that a supplier's good capability can help reduce the uncertain outcome of developing a new module (Hofstede, 1984; Kale, 1991; Doney et al., 1998) Case companies cooperate with suppliers which have good capability to help lower high levels of uncertainty, leading to the speedy quickly enrichment of service content on kiosk, the control of service quality and increased turnover in support of the MMK service development.

In summary, the present study found that case companies often build goodwill trust and cooperate closely with fundamental suppliers (i.e. IT or logistics suppliers) in the process of developing a new service. The goodwill trust between them is on the basis of their previous experience of cooperation. Case companies are willing to cooperate with existing supplies, thus increasing the predictability of the supplier's behaviour and reduced transaction costs. Moreover, case companies may cooperate with suppliers on the basis of competence trust when they have no prior experience of cooperation with them because suppliers' good capability can be enough to help case companies limit the technological or market uncertainties in new service developments. These suppliers often cooperate with case companies to contribute sub-systems, additional functions, or new modules to service developments. Further, case companies cooperate with some suppliers on the basis of contractual trust because most of these suppliers provide no specific resources to the case companies in new service developments. Both case companies and suppliers can choose a better deal as regards cooperation and can also choose to follow the terms of the contract terms in executing the task.

7.5 The relationship between trust and the speed of new service development in two selected services

Finally, this section discusses the relationship between trust and the speed of developing a new service in the two services under review.

7.5.1 Online shopping with pick-up at store service

Exploring the relationship between trust and the speed of developing this service, the present study found that if functional suppliers have good capability, new service developments can be speeded up. Suppliers with good capability and reputation in their domain are capable of identifying potential problems and restrictions. This in turn can improve the accuracy of the service development, leading to reduced uncertainty as to outcomes and a saving of the time needed for different and repeated examinations in the process of new service development. One member of staff from Company P said:

> *"The speed of service development was influenced by our partner's reputation and capability in its domain. This is because partner who has good capability can help our company to save time in identifying developmental problems and carrying out different examinations."*

Moreover, convenience store chains with previous experience of cooperation with suppliers can speed up the development of new services. This is because both the cooperating firms often spend much time on figuring out the requirements and restrictions of each other when they first work together. For example, both companies have to spend time to understand the requirements and restrictions of both IT systems when these are connected in the process of new service development. Companies may also spend much time on carrying out examinations in order to confirm the stability of this connection. The building of trust between the two companies can be achieved through the process of discussion and examination when they first cooperate. It can also increase the predictability of the partner firm's outcome and capacity, leading to less time being needed required to discuss the development problems and to repeat examinations. One previous member of the marketing staff from Company E said:

> *"The speed of service development was influenced by whether or not previous cooperative experiences existed between our company and our partner firms. Both sides often spend much time on figuring out the requirements and restrictions on both sides and on repeated examinations when our company begins to cooperate with suppliers."*

Furthermore, the present study also found that trust built on the basis of a history of cooperation between staff on both sides leads to accelerate service development. In terms of the previous interaction between the two sets of staff, the predictability of the cooperating staff in capability and behavior may increase. Both sets of staff are also willing to share useful knowledge through appropriate routines and to focus on the development of appropriate solutions for problem solving without having doubts about personalities, leading to saved time and effort in monitoring in the process of new service development. One manager from the supplier of the applied IT system stated:

> *"The speed of service development was influenced by the trust built on previous cooperative experience. If the staff of both sides have previous interaction, the speed of service development will increase in terms of saving costs in communication … It can help staff both to directly focus on problem solving and to understand the communication routine without any doubts."*

7.5.2 Multiple media kiosk (MMK) service

There was also a similar finding in the service development of the multiple media kiosk (MMK) in investigating the relationship between trust and the speed of developing the new service. Suppliers with good capability in their domain and with previous cooperative experiences with other firms can reduce the time required in the process of new service development. Suppliers with good capability and reputation in a specific domain can help convenience store chains to identify functional requirements and clarify potential problems in the process of new service development. Suppliers also help convenience store chains to save the time and cost of carrying out examinations when systems are connected and reduce the outcome uncertainty in a new service development. A manager from one of the service content companies stated:

> "*Company E and Company Q trusted our capability to develop this service content because our company had good development experience with other convenience store chains. New services will be developed faster when they cooperate with our company."*

Moreover, the present study found in addition that previous cooperative experiences between firms can speed up the development of the new MMK service. For example, convenience store chains often cooperated with their existing partners and, to develop this service, simply transformed the existing service content on kiosk. This is because the convenience store chains had previous experience of such cooperation m and understood their partners' capability. Previous experience of cooperation between firms helps both sides to save the time and cost of monitoring the supplier's development

process and making repeated examinations because the predictability of the supplier's outcome and capability gradually increases during its first efforts to cooperate with the convenience store chains. A manager from Company Q stated:

> *"If some service content companies simply transformed their service content on kiosk, new service developments take less time because of the previous experience of cooperation in developing other services. Our company fully understood its suppliers' capability and the restrictions and requirements of their systems through the many discussions and examinations held during cooperative projects in the past."*

A member of staff from the IT section of Company F also stated:

> *"Our company trusts the software supplier's capability in developing the IT system because we have long-term cooperative experience with it. Our company does not have to spend too much time on repeated testing."*

7.5.3 Cross-case comparison between two selected services in the relationship between trust and the speed of new service development

The present study found that the high level of trust between firms speeded up the development of two selected service on the basis of previous experience of cooperation between firms and the supplier's capacity in these specific domains. Case companies preferred to cooperate with partner firms which had previously worked with them. To do so can reduce the time needed to understand the requirements and restrictions of both sides and to check each other's work during the development process. According to previous studies, the mutual trust which has developed between partner firms can save the time and effort needed for checking (Dyer and Chu, 2003; Child *et al*., 2005). If partner firms have experience of working together, they are more likely to have a certain level of trust in each other's capability and potential outcome. From their experience of cooperation, the cooperating firms may reduce the time required for examinations to identify development problems and the testing of service qualities in subsequent cooperative working. However, case companies cooperating with existing suppliers may cause problems with the limited pool of expertise available for new service developments. Some potential suppliers may have better knowledge and capability to contribute to new service developments, but they never cooperate with case companies. Case companies often assess the capacity of existing and potential suppliers and choose an appropriate supplier to contribute different service developments. Suppliers with good capability and reputation in their domain can help case companies to save time in identifying the requirements of functional development and shedding light on the development problems, leading to reduced outcome uncertainty with regard to

developing new services. In turn, this can save time on repeated examinations of the quality of service provided by the suppliers and speed up new service development.

In the past, a few studies have argued that partnership with a high level of trust has a positive influence on time efficiency in new product development (Bonaccorsi and Lipparini, 1994; Dyer and Chu, 2003; Child *et al*., 2005). Moreover, Bstieler (2006) investigated in depth which antecedent may promote trust being built between firms and the way in which this issue is associated with performance in new product development. His research found that partner firms which work together in an honest and frank manner, keep their promises, make no unwarranted claims and support each other build trust between themselves and other firms. The trust built on this basis has a positive effect on the performance measures, including partnership satisfaction, intentions to renew the partnership, the financial performance of the product in the market and time efficiency. The present study further found empirical evidence that previous experience of cooperation between firms and a supplier's good capability in its domain can help trust building between firms to grow. Such trust was able to promote the speed of new service development in two selected services.

Furthermore, the present study also found that, when case companies developed the online shopping with pick up at store service, trust had a positive influence on the speed of new service development at the individual level. Individuals of both sides with previous experience of cooperation and interaction can increase the predictability of other individuals' behaviour. It may also increase individuals' confidence in the reliability, competence and dependability of their opposite numbers in the partner firm, which leads to a certain level of trust being created between individuals (cognition-based trust). This in turn the staff on both sides are willing to share valuable knowledge through appropriate communication routines to contribute to the outcome of a new service development rather than to focus on doubts about individuals' personalities and behaviour. This leads to a saving of time and effort on monitoring. Recently, a few studies have found that interpersonal trust has a positive influence on effectiveness at the inter-organizational level (Zaheer et al., 2002) and project level (Massey and Kyriazis, 2007). Zaheer et al. (2002) find that interpersonal trust between middle-level managers has a significant influence on daily efficiency in inter-firm alliances. Moreover, interpersonal trust between managers can improve the

effectiveness of cross-functional cooperation within a firm, increasing the effectiveness of decision-making and of less monitoring (Massey and Kyriazis, 2007). The present study further found empirical evidence that previous experience of cooperation with other individuals in a cooperating firm helps to build further trust building between individuals on both sides, because of the predictability and reliability of individuals' behaviour and capabilities may increase. Thus, interpersonal trust built on previous experience of cooperation promotes the speed of developing new services.

7.6 Summary

The main focus of this chapter was to identify how interdependence and trust vary across four cases and two selected services and in particular, how interdependence and trust influence the speed of new service development across two selected services. First, the present research found that case companies have a mutually dependent relationship with fundamental suppliers (i.e. IT and logistics suppliers) in two selected service developments. Mutual dependence can help a firm to restrict opportunistic behaviour, enhance information sharing between firms and reduce uncertainty in transaction outcomes. In addition, the interdependence between case companies and other suppliers (i.e. e-shops, service content companies and third party distribution company) was based on valuable resources. These suppliers have different dependent relationships (asymmetrical or mutual) with the convenience store chains which are determined by the number of alternatives and amount of essential resources required.

Moreover, the present study further investigated the relationship between interdependence and the speed of developing new service development in the development of two selected service. Mutual dependence between case companies and their suppliers may reduce time required for new services in two selected examples. The present study also found that the time required for new service development may be reduced when case companies have asymmetrically dependent relationships and suppliers, in particular in the development of the MMK service. Accordingly, the interdependence between firms has a positive influence on the development speed, whatever the different dependent relationship (asymmetrical or mutual) between case companies and suppliers (fundamental or non-fundamental) in the development of two selected services.

Second, the present research found that the trust between case companies and suppliers in developing important functions (i.e. IT and logistics) was based on long-term experience of cooperation between them and on the supplier's capacity. Interpersonal trust was another important factor for trust building when case companies developed strategic functions (i.e. logistics and marketing) with suppliers. The other suppliers, including the service content companies, a hardware manufacturing company and a third party distribution company, cooperated with the case companies on the basis of their good capability and their reputation in their domain for building trust. In addition, previous experience of cooperation also contributed to the trust between the service content companies and the case companies.

Moreover, the present study investigated the relationship between trust and the speed of new service development in two selected services. Trust built on previous experience of cooperation between firms can reduce the time required for developing two selected services. This is because previous experience of cooperating with partner firms can reduce the time required for assessing one another's capability and outcome. By collaborating with suppliers with good capability, case companies can save the cost and time of monitoring and identifying potential problems, which in turn may reduce the time required to develop a new service. Accordingly, the present research found that the different types of service development did not have great influence on the inter-organizational trust associated with the speed of new service development. In additional, interpersonal trust built on previous experience of cooperation between individuals of both companies can promote the speed of new service development because the predictability and reliability of individuals' behaviour and capabilities increases and the time and effort spent on monitoring accordingly goes down.

Chapter 8: Discussion of the empirical findings – Organizational routines for knowledge transfer

8.1 Introduction

Two earlier chapters (Chapters 6 and 7) examined how Taiwanese convenience store chains use and manage different inter-firm relationships with external firms in the process of new service development. Establishing different inter-firm relationships with external firms can be seen as a relational capability for value creation, but the issue of which routine/insource mechanisms focal firms adopt to acquire, assimilate, and exploit related knowledge with external firms and within focal firm is still being investigated. This chapter aims to identify how organizational routines (inter-organizational level and intra-organizational level) vary across four cases (Companies E, F, H and O) and two selected service developments (the online shopping with pick-up at store service and the multiple media kiosk service). In particular, it will address the influence of organizational routines on the speed of new service development and compared them in two selected service developments.

The present chapter is organized as follows: first, sections 8.2 and 8.3 separately describe and compare how Taiwanese convenience store chains use organizational routines with external firms to transfer knowledge in developing two new services. The similarities and differences between two types of development of new services in inter-organizational routines for knowledge transfer will be discussed in section 8.4. Intra-organizational routines for knowledge transfer across four convenience store chains will be illustrated and compared in sections 8.4 and 8.5. Furthermore, the influence of organizational routine on the speed of new service development in two selected services will be investigated in section 8.6. Finally, section 8.7 compares the similarities and differences between two selected services in the relationship between organizational routine and the speed of new service development.

According to previous research, organizational routine can be defined as: "*recurring patterns of behavior of multiple organizational members involved in performing organizational tasks*"(Feldman and Rafaeli, 2002). Organizational routine involves many persons in multi-actions recurrently carried out in order to accomplish

organizational tasks. It can be seen as architecture for transferring knowledge/resources within a firm and between firms. According to previous research, cooperation between firms used such inter-organizational routines as regular and varied meetings, visits and telephone communication for the sake of knowledge and information flow (Dyer and Nobeoka, 2000; Mante and Sydow, 2007). Lertpittayapoom (2005) also found that knowledge was shared through scheduled routines such as different kinds of meetings at different inter-organizational levels (i.e. individuals, groups and organizations). Routines can encourage individuals to work together to share knowledge with others who are related actors. They also provide a bridge to connect the knowledge being transferred to different actors and enhance the knowledge transfer between actors. Furthermore, some previous studies found that firms adopted cross-functional meetings and face-to-face and telephone conferences by members of cross-functional projects and small peer-to-peer group discussions within for the purpose of routing knowledge to appropriate departments and staff and completing the organizational task (Mante and Sydow, 2007; Hale and Tidd, 2009). Previous research has argued that a firm can be conceptualized as a bundle of resources and knowledge, linked by the firm's specific routines to contribute to its competitive advantage in the concept of knowledge sharing within the firm (Barney, 1991; Madhok, 1996).

8.2 The inter-organizational routines for knowledge transfer in the development of online shopping with pick-up at store service

This section identifies how two groups (Company E and Companies F, H and O) adopted different inter-organizational routines for knowledge transfer to external firms in developing the online shopping with pick-up at store service.

8.2.1 Company E

Initially, Company E formed a project team with external firms and used a project meeting to develop this service. In order to constitute this service framework, this team deployed staff from Company E's marketing staff (marketing function), financial staff (financial function), bill payment service staff (platform provider) and staff from group companies, one from its IT system supplier (IT function) and one from its logistics company (logistic function) to coordinate different function developments of this service in the initial stage. This service development involved bill payment service staff,

because the online shopping with pick-up at store service was based on existing bill payment service platform since it used different barcodes to recognize different services and collect payment from consumers. First, a project meeting was convened with team members to discuss the system connections for data transfer between different functions (e.g. the marketing, logistic and IT functions). All the team members recurrent used the project meeting to provide the respective system requirements and existing operation procedures in order to consider the possible solutions for coordination and to confirm with functional members when minor system adjustments took place. For instance, the logistic company confirmed with IT system supplier the format of data transfer because the consumers' orders were given a barcode to confirm the logistic flow. The logistic company also discussed with the financial staff of Company E the due date for payment transfers and account checks. The marketing staff of Company E discussed with the IT system supplier about the requirements of IT system connection. He also discussed with logistic company the service operation procedure of the logistic flow in order to set up formal contract terms to cooperate with the e-shops. The team members also used telephone and peer-to-peer discussion to discuss unexpected problems (e.g. system connection) and, after discussion, confirmed their agreement at the next project meeting. This project team set up different milestones to achieve different tasks and used project meetings to review the progress of development of different functions. The previous manager from the IT system supplier said:

> "*We often used project meeting to discuss the respective requirements and problems in cross-functional development... Team members also informally used peer-to-peer discussion and telephoned other team members if any of them met any development problems. We also had many regular meetings (review meeting) with senior managers in order to report progress and coordinate the solution to cross-functional problems at a high level.*"

Moreover, all the team members (marketing staff, the IT system supplier, logistics company, financial staff and bill payment service staff) had to attend periodical review meetings to confirm user demand and to report progress, problems and minor changes with senior managers (including the general manager, the managers from related departments of Company E and the suppliers). This is because Company E often cooperates with its affiliated companies to develop new services. Such meetings can be used by team members to propose new ideas and get confirmation from senior managers in acquiring and coordinating related resources and knowledge from different companies to contribute to the development of a new project. Company E also used a

unified contract (including specifications and service operation procedure) with the e-shops to share information about ways to provide their products to consumers through a service framework which was established by Company E and its affiliated companies. After this service development was authorized to Company P (Company E's affiliated company), this company played the dominant role in the continuous development of this service in the second stage. Company E, Company P and the IT system suppliers continued at regular project meeting to discuss the interface of the system and the requirements of different functions (e.g. IT and marketing functions) for the development of a new project to improve or add value to existing service operation procedures. For example, Company E or Company P would come together to discuss the IT requirements and identify possible problems in new service projects if they were responding to a demand to develop new services on the basis of the existing service system. Following this, IT staff from Company E and the IT system supplier of Company E would be involved in working out a plan for the system and developing the IT requirements and specifications. After this, Company P provided IT system requirements to its IT system suppliers, in order to develop its functional systems and specifications. This is because the IT system of Company E was separated into its main IT systems (the convenience store's internal systems, such as its POS system) and its functional systems, to ensure that its main IT systems would operate normally. The IT system suppliers of Company E provided an interface for connecting different e-commerce services. Company P had regular meetings (twice a month) with its applied IT system suppliers in order to discuss the requirements of the new project, track its progress and discuss ways to solve its problems in developing functional systems. After the new project had been developed, Company P provided the e-shops with an operation manual and specifications/documentation and visited them regularly in order to understand the process and problems of their operation. The manager from Company P said:

> *"Project meetings involved our company (the marketing company), the IT system supplier (the main IT system supplier of Company E) and Company E (coordinator). Our company discussed with Company E and its IT system supplier its IT requirements and the operating procedure of the new service project."*

One manager from the chosen IT system supplier stated:

> *"Our company had regular meetings with Company P (twice a month) to review progress (in the IT function), to discuss what problems needed solving, such as system connections and to confirm the structure of the IT system."*

8.2.2 Companies F, H and O

Four convenience store chains (Companies F, H, O and N) formed a joint venture (Company C) to develop the online shopping with pick-up at store service. Although Company N had been acquired by Company F in 2007, its parent company still held 25 percent of the shares of Company C. The general managers of these four companies had a board meeting once a month in the initial stage to discuss and decide on new project plans and to follow the progress of the development. Different functional staff of the convenience store chains (e.g. the marketing, IT and finance functions) used peer-to-peer discussion with Company C's staff and that of other convenience store chains in order to create a simple service operation procedure and provide the contract for the e-shops. Some of the functional staff discussed with logistic companies how to connect different IT systems for transferring data between different actors. For example, one employee from a third party distribution company and one member of the IT department of Company F used peer-to-peer discussion to discuss the service procedure and design format for data transfer on the basis of different IT requirements. The third party distribution company also directly discussed with Company F's staff while developing the service procedure for the finance and IT functions. The previous manager of the third party distribution company said:

> *"To begin with developing this service, one member of the IT staff from Company F and I discussed how the logistics flow of this service should be designed, drew some diagrams and decided the initial structure and format for the information change. We did not have any formal meeting to communicate with the other staff."*

After an IT system supplier joined this service development, it cooperated by holding functional meetings with the third party distribution company and Company F to coordinate the various functional developments such as the logistic flow and information flow. This was necessary because the third party distribution company can be represented as playing the distribution role to provide the requirements in developing the logistical function. Company F can provide the service requirements in the existing operation of the convenience store. The IT system supplier integrated the requirements of these two companies, developed an IT platform and defined the format and procedure for the data transfer between the firms. The IT system supplier also developed web-based documentation and separated the various categories of related actors (i.e. the convenience store chains, the third party distribution companies, the e-shops and the

distribution companies owned by the convenience store chains). Each actor had different authority to access particular kinds of documentation, such as the delivery process (the delivery and return of goods) and the format of the information transfer based on its role and task in this service development. This documentation would be added and revised to improve the service in different functions. The previous manager from the IT system supplier said:

> *"Different function developments required regular meetings such as one for the channel and one for the logistics. The IT function development also has regular meetings if some new requirement needs to be developed. Our company invited the IT related actors to meetings to discuss the IT requirements of the different actors. We also had web-based documentations and presented them in different formats for the use of different actors, such as the logistics, e-shops and convenience store chains…etc. Our company had to assess the actors' qualifications and then provide authority with a pin number so that they could use this documentation."*

As Company C took over control of the continuous improvement of the operation procedure of this service at the time, it had to integrate different suggestions or requirements from the related actors (i.e. the IT system supplier, third party distribution companies, convenience store chains and distribution companies owned by the convenience store chains) when new functions and requirements were proposed by the actors. Company C first used peer-to-peer discussion with the IT system supplier and third party distribution company in order to understand the feasibility and service requirements of the new project. Then a project meeting was held with the related actors (e.g. the IT system supplier, convenience store chains and third party distribution companies) in order to discuss service requirements in each function, report operation problems and set up different milestones for the new service project. Different actors would be invited to join the meeting, according to what areas were being developed and what problems had to be solved. For instance, Company C and the related actors often used a project meeting to discuss the possible solutions of each function and reached consensus in the first week. The requirements and specifications of the initial project would be made by different functional companies in the second week. These companies used project meetings to discuss and confirm their final requirements and develop final specifications. This allowed the related actors to individually develop functions of their own which met the final requirements and specification. Finally, convenience store chains developed an operation manual, offered it to the convenience stores and provided training to each store's staff because the store staff had to convey the new service

procedure to the consumers. The previous manager of Company C stated:

> *"Our company is a coordinator in this service development. … If I have a new idea or new task, I will discuss the possibility of implementing it with the IT system supplier, especially in the IT function, by peer-to-peer discussion. Then I would invite related actors, such as the convenience store chains to a formal meeting to discuss it. The related actors were invited depending on what task or problem was to be discussed."*

In addition, this group also used a unified contract (including specifications and service operation procedures) with the e-shops in order to share information on ways to use this service framework to provide their products to consumers.

8.2.3 Cross-case comparison between two groups in using inter-organizational routines for knowledge transfer

Company E initially formed a project team with its affiliated companies (including one logistic company and one IT system supplier) and used project meetings to discuss the requirements of the new service across different functions, develop a possible operation procedure and identify potential problems in order to create a service framework. The review meeting involved the members of the project team and senior managers to review the progress of the new services and coordinate cross-functional resources for their development. After Company E authorized Company P to continue developing this service, Company E still used a regular project meeting with Company P and the IT system supplier to discuss the interface of the two systems and the requirements of the different functions (e.g. IT and marketing) for the development of a new project to improve or add value to the existing service operation procedure.

Unlike Company E, Companies F, H and O initially used peer-to-peer discussion with external companies (e.g. the logistics and IT system supplier) to transfer knowledge in different functional developments in order to create a simple service operation procedure and provide a service platform for the e-shops. After Company took control of the continuous improvement of the operation procedure of this service, it used a project meeting to integrate the requirements of the different actors (i.e. the IT system supplier, third party logistic company and the convenience store chain) and to plan a working schedule coordinating the different functional tasks in the development of the new service project. Before introducing project meetings, Company C may have used peer-to-peer discussion with its IT system supplier and third party distribution company

to clarify the requirements of important functions and discuss possible solutions. This is because these suppliers were the fundamental suppliers to contribute to this online shopping with pick-up at store service. Convenience store chains may also provide their demands and requirements in new projects on the basis of the convenience store chains' existing routine and consumers' demands. In addition, both groups often provided a standard contract and specifications to the e-shops which allowed the latter to deliver their products through this service platform. Table 8.1 summarizes the cross-case comparison between the two groups in their use of the inter-organizational routine for promoting knowledge flow in the development of the online shopping with pick-up at store service.

Table 8.1: Cross-case comparison in using inter-organizational routine for transferring knowledge in the development of the online shopping with pick-up at store service

Company E	**Companies F, H and O**
Project-team based, regularly cross-functional project meeting 1. Company E used regular meetings (including project meeting and review meeting) with one IT system supplier and one logistic company to develop the service framework. 2. After Company E authorized Company P to develop this service, Company P still used the project meeting with the IT system supplier and Company E to improve the existing service operation procedure.	**Peer-to-peer discussion, temporarily project meeting** 1. The IT, marketing and finance staff concerned from these companies discussed functional requirements in peer-to-peer discussion to gradually develop a service framework. 2. After Company C took control of developing this new service function and improve the operation procedure, it convened a project meeting with the actors concerned to integrate requirements across different functions and discuss possible solution until the new project was launched.

Source: Summarized by the author

According to Gorovaia and Windsperger (2010) research, they used the concept of information richness to operationalise the capacity of knowledge transfer. Previous studies argued that different communication mechanisms can be characterized as high or low degree of information richness (Daft et al., 1987; Sheer and Chen, 2004). They proposed that the degree of information richness depended on the level of attributes of a

communication mechanism, including its feedback capability, language variety, availability of multiple cues (e.g. voice inflection, words, and graphic symbols) and personal focus (e.g. emotion and feeling). When a mechanism has more of these attributes, it can be identified as higher in information richness and having greater capacity to transfer knowledge. For example, face-to-face meeting is considered as the highest degree of information richness mechanism. It allows the mutual and rapid feedback, simultaneous communication of multiple cues, and high variety language which facilitates shared meaning among individuals. In addition, previous studies mainly focused on the question of which mechanism (high or low information richness) are effective under different degrees of task ambiguity (Daft et al., 1987; Sheer and Chen, 2004; Gorovaia and Windsperger, 2010). When the degree of task ambiguity is higher, individuals would not know for certain what questions should be asked or if there is no knowledge available to answer these questions if they are posed for the sake of a specific task. A higher degree of task ambiguity may lead to misinterpretation and recurrent discussion to clarify the communication content. Thus, if the mechanism for knowledge transfer has a relatively higher degree of information richness (e.g. meetings, training and telephone calls), it will be capable of handling a higher level of task ambiguity. The lower degree of information richness of knowledge transfer mechanism (e.g. manuals, reports and databases) can be used for effectively transferring knowledge with lower degrees of task ambiguity. The present research found that case companies used different degree of information richness mechanism for transferring knowledge in different stages of new service development. Both groups (Company E and Companies F, H, O) often recurrent used higher degree of information richness mechanisms (i.e. project meetings or peer-to-peer discussions) for transferring knowledge with their fundamental suppliers (e.g. IT system supplier or the logistic supplier) in the early stage of developing a new service, in order to lay the foundation of the service. This is because focal firms must collect greater information from these suppliers to constitute a service framework for the online shopping with pick-up at store service. Different functional staff on both sides firms often discussed and clarified different functional requirements, transferred different areas of domain knowledge, and coordinated different functional developments through project meetings or peer-to-peer discussion. In contrast, both groups used lower degree of information richness mechanisms (i.e. written instructions and specifications) for transferring knowledge with e-shops in the later stages of developing new services, because the service operation procedure had

already been codified and represented in documentation which is easier to transfer knowledge to and from and quicker to replicate.

8.3 The inter-organizational routines for knowledge transfer in the development of multiple media kiosk (MMK) service

Four convenience store chains cooperate with external companies to develop this service individually. Different inter-organizational routines were used for knowledge transfer in the process of the MMK service development and are discussed in turn below.

8.3.1 Company E

In order to develop the MMK service, Company E authorized Company Q (a group company of Company E), to develop the MMK service and to coordinate with its the different requirements of the affiliated companies (Company Q and two IT system suppliers). Regular meetings at different levels (weekly, monthly and quarterly) between Company E and its affiliated companies (Company Q and the IT system suppliers) were held and involved different functional staff from these companies. These regular meetings were used to discuss the service requirements of the different functional developments (i.e. the IT system requirements and marketing support), identify potential problems and review progress in order to establish the service framework of the MMK service. Then these meetings at different levels continued to be held to develop the different business modules for the MMK service. First, regular weekly meetings were held to discuss the different function developments (e.g. the IT system and marketing), to discuss the functional requirements of the new business module and to identify potential problems. For example, the IT system's regular meeting involved IT staff from Company E, the IT system suppliers and the project manager from Company Q to discuss the IT requirements and solve any problems in the IT system. Company Q's project manager would provide the IT requirements of the new business module for discussion. Company E's IT staff and IT system suppliers would review the IT requirements of the new business module and consider the problem of connecting the systems of the two firms. In turn, the IT system suppliers developed new IT functions which were based on existing IT systems and project requirements. The marketing and IT staff from these cooperative companies (Company E, Company Q and the IT system

suppliers) also had weekly cross-functional meetings to discuss the initial requirements of the new business module and possible service operation procedures and then transform these requirements into IT specifications for connecting the systems. Senior managers from these cooperative companies were involved in monthly and quarterly meetings to review progress and coordinate cross-functional resources for developing the new project. A project manger from Company Q stated:

> *"Our company has regular meetings with partner firms at different levels. For instance, there is a weekly regular meeting on the IT function and its development. The basic participants of this meeting are the IT staff from different companies, including the IT staff of Company E, the staff of the software supplier and the project manager of our company. Our company provides its partners' requirements and the marketing support needed in the new service project. There are regular meetings on developing the marketing and marketing function which are held once a week to discuss detailed coordination and solve problems. Senior managers from Company E, Company Q and the IT system suppliers also have of regular meeting at different levels (quarterly or monthly) to review progress, turnover and profit in different service projects and coordinate cross-functional resources for developing new services."*

Moreover, Company Q and hardware manufacturing used a project meeting (three or four times a week) in the development of the hardware (the kiosk) in order to clarify Company Q's initial requirements and develop the specifications for the kiosk. The hardware manufacturing company used project meetings to share its knowledge and development experience for the kiosks and provided suggestions to Company Q on the basis of considerations of hardware modulization and cost. It was asked to develop different modules to contribute to the development of the MMK service in order to comply with consumers' demands. Company Q also used the project meeting to set out its requirements and to evaluate possible solutions. Company Q and the hardware manufacturing company also used the minutes of these meetings to confirm any changes of requirement afterwards. Technological documentation was used to share the specifications and checklists between the two sides in order to confirm Company Q's requirements and to develop a prototype. The hardware manufacturing company offered different levels of change during the prototype examination to try to match Company Q's requirements. The manager of the hardware manufacturing company commented:

> *"Our company set up a team (five or six people) to develop hardware with Company Q. We used project meetings (three or four times a week) to discuss and confirm the hardware specifications based on different considerations such as development cost and modulization. We also shared technological documentation with Company Q in order to be clear about and confirm its requirements."*

Moving on to the development of a new business module between Company Q and the service content companies, Company Q assigned a project manager, marketing staff and IT staff to meet the service content company in order to discuss different functional requirements and identify potential problems (i.e. in marketing and IT functions). Project managers from both companies were used to coordinate the different perceptions of the project requirements by the marketing and IT staff because their different backgrounds (i.e. domain knowledge) might have cause misunderstandings in identifying the project requirements. The marketing staff, IT staff and project manager from Company Q and the service content company used separate functional meetings (for peer-to-peer discussion) in a different functional development of the new business module. For example, both IT staff would come together in the development stage to discuss both sides' IT requirements and to identify possible solutions to the problems of the new business module, in order to develop specifications for connecting the systems. The marketing staff on both sides also used functional meetings to discuss in detail the contract terms, such as marketing support and profit sharing between firms. Finally, both sets of IT staff would test the connection between the systems according to the specifications which had been developed. Project meetings were used regularly to review progress and to coordinate different functional requirements until the new business module was launched in the kiosks. A manager from the service content company said:

> *"First, our company had several formal meetings with Company Q in order to discuss possible types of cooperation and the service operation procedure. Then Company Q would provide specifications to our company in order to connect both IT systems. The line of communication between our company and Company Q can be divided into three parts: the project manager discussed things with its project manager, the IT staff discussed with things its IT staff, and the marketing staff discussed things with respective marketing staff on the basis of different functional developments. Formal meetings involved different functional staff from both sides in order to review development progress and to confirm the service structure."*

When Company Q cooperated with the service content company on the basis of the existing business operation, the marketing staff from Company Q used a project meeting with the service content company's marketing staff or project manager to clarify the IT system requirements and existing service operation procedure on both sides. Then both sets of marketing staff began to discuss in detail the contract terms and profit sharing between the firms. Company Q's marketing staff also provided

specifications for the service content company to develop a user interface to connect the two systems. The IT staff from the service content company would come with its marketing staff to discuss any IT problems (i.e. in the system connection and user interface development) with Company Q's staff (marketing and IT staff) if neither could clearly identify IT problems. The IT staff from Company Q and the service content company would in the first stage examine the system connection. The marketing staff from both companies would join the examination process later to test again after both sets of IT staff had confirmed that the system connection was ready. If problems arose, both sets of marketing staff would and invite both sets of IT staff to a project meeting to identify possible problems, find possible solutions and then test the system connection again.

8.3.2 Company F

To begin with the development of the MMK service in Company F, the IT department of Company F used its customary regular meeting (twice a month) with an IT system supplier to develop the IT functioning of the MMK service. This is because the IT department of Company F had regularly been holding a formal meeting with its IT system supplier to discuss new service ideas, review existing development progress and problems, share related knowledge and confirm service requirements. The IT department of Company F provided the IT requirements (i.e. the service functions and the interface between the hardware and software systems) and a checklist to the IT system supplier in order to develop the specifications and then code the program. Then the IT system supplier evaluated process and time of the development and notified the IT department of Company F of the change in IT requirements. The IT department of Company F confirmed the development process, time and requirement changes with the IT system supplier and included these in its schedule for the project development. Formally, the IT department of Company F divided the project development into three stages: confirming the specifications, system development and system examination to oversee the progress of the development with the IT system supplier. Next, the IT system supplier confirmed the checklist with Company F before the system examination. Company F confirmed the checklist based on its requirements and replied to the checklist from the IT system supplier. Finally, after finishing the system examination, the latter released the source code and related documentations (i.e. the specifications, checklists and the operation manual) to Company F.

Moreover, the IT department of Company F and hardware manufacturing company also used a project meeting in the development of the kiosk in order to identify the IT requirements of the hardware (i.e. the variety of their functions and the shape and size of their hardware) on the basis of the initial demand from Company F. The hardware manufacturing company first shared its related development experience/knowledge of kiosk and provided Company F with suggestions. Then the IT department of Company F and the hardware manufacturing company recurrent used project meetings to identify the essential functions and gradually confirm the hardware requirements. If the IT staff of Company F requested a change in requirements, the hardware manufacturing company often sent an email to the IT staff of Company F to confirm this change. Finally, the hardware manufacturing company provided detailed specification to the IT department of Company F in order to confirm the size, function and shape of hardware and further to develop a prototype of the hardware. The manager from the hardware manufacturing company said:

> *"The whole development process would be confirmed by formal meetings. Company F used several formal meetings to confirm its requirements with our company. Our company also gave suggestions for developing hardware to Company F and finally confirmed the hardware specifications with the company … We also provided Company F with formal documentation (specifications) to confirm the hardware specification before formal production."*

During the development of the IT system and hardware in the MMK service, the marketing staff of Company F also developed a possible business module in order to enrich the service contents on kiosk. First, the marketing staff of Company F had telephone discussions with the marketing staff of a possible cooperating company (a service content company) in order to understand the service requirements and the possible development of the business module. After the possibility of developing the new business module was confirmed, the marketing staff of Company F would use project meetings with its partner firm's marketing staff to suggest a service operating procedure for the new business module and to begin to discuss contract terms. Then the marketing staff from both sides would invite different functional staff from both sides to join a project meeting and then use individual peer-to-peer discussions to develop the requirements in different functional areas. For example, in the IT function development, both sets of IT staff discussed the IT requirements and the user-interface and system connections for the MMK service. Both sets of marketing staff discussed the contract terms in detail, such as its marketing supports and profit sharing. E-mail and telephone

were used to discuss unexpected or emerging problems in the development stage, such as the examination process and system connections. After a while, marketing staff on both sides invited IT staff to join the project meeting again to discuss problems with the examination stage and to review progress. A member of the marketing section staff from Company F stated:

> *"Our company first discussed a possible business module on the phone with the service content company. Then after that, a formal meeting was used to confirm both the development requirements and the service structure. For example, our marketing staff communicated with marketing staff of service content company in order to understand both requirements and service contents… If the two sets of marketing staff cannot deal with a technological problem, I will arrange another meeting and invite both sides IT staff to communicate and identify their technological requirements and problems… The formal meeting would be involve both sets of marketing staff and other functional staff (e.g. to do with finance and IT functions) to discuss functional developments in detail and establish a communication routine in each function."*

When a business module was set up on the kiosk, the marketing staff of Company F provided only specifications (i.e. the IT requirements for system connection and client-interface) to service the content company when they developed the business module. Both sets of marketing staff could use project meeting to discuss contract terms such as payment methods and profit sharing. Both sets of IT staff could meet if necessary to discuss problems of system connection.

8.3.3 Company H

The cooperation between Company H and the external supplier was mainly focused on developing different business modules for the kiosk because this company developed many functions (e.g. marketing and IT functions) within itself and directly provided specifications to the hardware manufacturing company. Company H used project meetings with different service content companies to develop different business modules for the kiosk. To begin with the cooperation with service content companies, the marketing staff discussed the intentions of potential partners by telephone in order to understand them and debate different types of cooperation and service requirements. Then Company H and the service content company signed a cooperation memorandum about service structure and confidential terms in the development of the new business module on kiosk. Both the marketing and IT staff used project meetings to discuss possible solutions, service operation procedures and contract terms. They might also invite the IT staff concerned to identify the IT requirements, the format of data transfers

and the client-interface of the new business module. Following this, specifications were developed by the IT staff of Company H and reviewed by the IT staff of the service content company in order to check the IT requirements for connecting the two systems. Once the specifications were confirmed, both sets of marketing staff served as project managers to control the progress of the development. If development problems arose, when for instance the connections between the systems were examined, functional staff (e.g. the IT staff) would report problems to the project manager. The project manager might hold a project meeting again if needed and invite both sets of the staff concerned to discuss problems and find solutions. If the business module had been established for the kiosk, Company H provided only specifications (i.e. the IT requirements for the system connection and client-interface) to the service content company to develop the existing business module. Both sets of marketing staff might use a project meeting to discuss contract terms, such as payment methods and profit sharing. Both sets of IT staff might also meet to discuss problems of system connection, if needed. The project manager from Company H stated:

> *"Our company first discussed the marketing functional development with potential partner by phone and then signed a cooperation memorandum… Our company would provide specifications to its partner for development if there was a business module already. If the business module was totally new, both sets of staff would have to discuss the specifications and our IT staff would have to see it in writing in order to discuss and confirm it at the next meeting."*

8.3.4 Company O

Company O relied on its partner firms (two IT system suppliers and one hardware manufacturing company) to develop this service. These partners mainly used project meetings (once or twice a week) with the project manager of Company H to discuss the design of the user-interface, consumers' demands and the service operation procedure. The project manager of Company O might invite his staff to join the project meeting in order to confirm the requirements for connecting the system and identifying potential problems. After both sides' IT requirements were confirmed, one of the IT system suppliers gave the specifications and operation manual to Company O so as to connect the two systems and train store staff in handling this service. The marketing manager from Company O said:

> *"Our company used project meetings with partner firms (once or twice a week) to discuss user-interface design, consumers' opinions and feedback and development requirements... Partner firms also provided specifications and an operation manual to our company in order to connect the two IT systems and train store*

staff to operate this service."

8.3.5 Cross-case comparison of different companies in using inter-organizational routines for knowledge transfer

Companies E, F, H and O individually developed this service with their external partners (i.e. the service content company, hardware manufacturing company and IT system supplier in each case). The inter-organizational routines for transferring knowledge between the convenience store chains and external firms may be described as follows. In order to develop an IT system for use with the MMK service, Company Q had regular meetings (functional and cross-functional) at different levels with their IT system suppliers and Company E in order to discuss its requirements and service procedures in the development of an IT system for the MMK service. Moreover, the IT department of Company F used regular meetings with its IT system suppliers to discuss its IT requirements and checklists in order to develop specifications in the development of an IT system in this regard. Furthermore, Company O also used project meetings with external partners (two IT system suppliers and one hardware manufacturing company) to discuss the design of the user-interface and to identify possible problems in connecting the both systems. Company H used internal development to set up the IT system of its MMK service.

With regard to the development of hardware in the MMK service, Company Q (Company E's affiliated company) and Company F used project meetings with a hardware manufacturing company to discuss their hardware design requirements (e.g. shape, size and function) and to identify possible solutions in developing the final specification and prototype for their hardware. Company H developed its own specifications for hardware and gave them to the hardware manufacturing company. The hardware itself was directly provided by an external partner and Company O was not involved in its development.

Finally, all the convenience store chains except Company O often used a project meeting with the service content companies in developing a new business module for the MMK service. Company O was the exception because it did not directly cooperate with any service content companies to develop a new business module on kiosk. The new business module was developed by its partners in cooperation with the service

content companies. Company E authorized its affiliated company (Company Q) to develop different service contents for the kiosk. Company Q assigned a project manager, marketing staff and IT staff to convene a project meeting with the service content company in order to directly discuss different functional requirements and identify potential problems (e.g. marketing and IT functions) in the development of its new business module. The marketing staff, IT staff and project manager of Company Q and the staff concerned from the service content company used separate peer-to-peer discussions about different areas of the functional development of the new business module. Then different functional requirements were discussed with Company E and IT system suppliers through regular (functional) meetings in order to discuss the marketing plan and IT requirements in detail.

Like Company E, Companies F and H also used project meetings to develop new business modules for their kiosks. The marketing staff from Company F and H telephoned the service content company to discuss new project plans and to clarify project requirements. After that, the marketing staff of Companies F and H held project meetings with the service content company to further discuss project requirements on both sides and to identify possible service operation procedures and contract terms. Both sets of IT staff would be involved in project meetings to discuss technological requirements and identify potential problems in order to further develop the specifications by the IT staff of the convenience store chains.

Moreover, the marketing staff of the convenience store chains initially used a project meeting (once or twice) with the marketing staff of the service content company to suggest ways of operating the service and contract terms if the convenience store chains were cooperating with the service content companies on the basis of an existing business operation. Then the marketing staff of the convenience store chains supplied the existing specifications (i.e. the design of the user-interface and the IT requirements for connecting the system) to the marketing staff of the service content company so that the service content of the kiosk could be provided. Specifications, including information about the design of the user-interface and the IT requirements of the system connection from the convenience store chains are an important resource for transferring knowledge between them when the scope of the existing business module has to be expanded quickly. Both sets of IT staff may at times be involved in a project meeting to identify

the problem of connecting the two systems' connection. Table 8.2 summarizes t cross-case comparison of the use made of inter-organizational routines for transferring knowledge in the MMK service development.

Table 8.2: Cross-case comparison of the use of inter-organizational routines for knowledge transfer in the MMK service development

Company name	Inter-organizational routine for knowledge transfer
Company E	1. Company Q used regular meetings (functional and cross-functional) with Company E and the IT system suppliers in order to discuss different functional requirements and potential service operation procedures for developing the main functions of the MMK service. 2. Company Q also used a project meeting with the hardware manufacturing company to discuss the design requirements for its hardware and develop the specifications and prototype of hardware in the development of hardware (kiosk). 3. The project meeting involved different staff (including the project manager, marketing staff and IT staff) of Company Q and the service content company in developing different business modules for the kiosk. Different staff might separately discuss different functional requirements peer-to-peer; different functional developments were also coordinated at these project meetings. Specifications played an important part in transferring knowledge between the convenience store chain and service content company in order to expand the scope of the existing business module.
Company F	1. The IT department of Company F used a regular meeting with the IT system supplier to discuss IT requirements and checklists and to develop specifications in the development of their IT system. 2. The IT department of Company F also used a project meeting with the hardware manufacturing company to discuss the hardware requirements and to transfer the specifications and prototype in the development of hardware (kiosk). 3. The marketing staff of Company F used project meetings with the marketing staff of the service content company for initial discussions about the requirements and contract terms of the new business module. Both sets of IT staff might be invited to discuss and confirm the IT requirements for connecting the two systems. Moreover, specifications can be used for transferring knowledge between the convenience store chain and the service content company on the basis of the existing business

	module.
Company H	The marketing staff of Company H first used a project meeting with the service content companies to discuss the project requirements and contract terms in the development of a new business module for the kiosk. The marketing staff might also invite the IT staff to project meetings to discuss the IT requirements and further develop specifications for latecomers.
Company O	The partner firms (two IT system suppliers and one manufacturing company) used project meetings with Company O to discuss the IT requirements on both sides for connecting the IT system and for the service operation procedure already in use in the store to set up the MMK service.

Source: Summarized by the author

As seen in the above cross-case comparison, the present study found that Companies E, F, and O used a higher degree of information richness of knowledge transfer mechanism (e.g. project meetings) with their fundamental suppliers (mainly the IT system supplier and hardware manufacturing company) in the early stages of developing new services in order to collect greater information and lay down the foundation of the service. This is because a focal firm should provide its service requirements with these suppliers to develop its IT system and hardware in order to construct the service framework. The staff of the various firms used a regular project meeting to discuss and clarify their IT system requirements, share knowledge of various kinds and transform their requirements into formal specifications.

Additionally, Company Q (Company E's affiliated company), Company F and Company H also used a higher degree of information richness in their mechanism for transferring knowledge (i.e. project meetings) with the service content companies to develop new business modules for the kiosk. Different functional staff (e.g. marketing and IT) often used a project meeting to discuss and clarify the different functional requirements, such as those needed for connecting both IT system and to develop documentation (e.g. specifications and contract terms) for the second company whose use of service content was similar. A lower degree of information richness of knowledge transfer mechanism (e.g. written instructions and specifications) was often adopted with service content companies when existing business modules for the kiosk were augmented, because the degree of project newness is lower. The service operation

procedure and system connection had already been codified and represented in documentation, which could be transferred more easily and replicated more quickly than if the project had been wholly new. Accordingly, the present study found empirical evidence that the choice of knowledge transfer mechanism is determined by the degree of project newness. Previous studies had argued that the degree of project newness traditionally defined how much of an existing product had to be changed or adjusted in new product developments (Clark and Fujimoto, 1991; Griffin, 1997). Verworn (2009) further proposed that the degree of newness is determined by how much information must be gathered in a new project development from the standpoint of information processing view. A task with more new elements must be completed by collecting rich information from different individuals or organizations. Thus, a higher degree of information richness of knowledge transfer mechanism (e.g. project meetings) should be adopted when the degree of project newness is higher.

8.4 Cross-case comparison of different services in using inter-organizational routines for knowledge transfer

This section compares the use of inter-organizational routines for transferring knowledge found in two selected service developments (the online shopping with pick-up at store service and the multiple media kiosk service). The development of the online shopping with pick-up at store service mainly focused on ways to deliver consumers' orders from e-shops to the convenience store and establish an IT platform for transferring data between the actors concerned (i.e. the convenience store chain, the IT system supplier, the distribution company owned by convenience store chain and the e-shop). Case companies often used project meetings or peer-to-peer discussion with their IT system suppliers and logistic companies to discuss service requirements and to transform these into different functional requirements when they wanted to develop their service operation procedure and specifications and to connect the systems used by different actors.

Unlike the same issue in the multiple media kiosk development, this service development mainly focused on establishing an IT platform to connect different IT systems between different actors (i.e. the convenience store chains, IT system supplier and service content companies) in order to provide consumers with different business

modules at the kiosk. Case companies first separately used a project meeting with external companies (e. g. the hardware manufacturing company and IT system supplier) to discuss their IT requirements and to develop a main IT system and hardware at an early stage to lay the foundation of the MMK service. This is because a project meeting can be adopted between firms to recurrent discuss and identify the service requirements of the convenience store chain and to transform these initial requirements into IT-based specifications. Accordingly, the present research found empirical evidence that case companies often used higher degree of information richness mechanisms (i.e. project meetings or peer-to-peer discussions) with fundamental suppliers for transferring knowledge to constitute the service framework of the two selected services in their early stages. Previous studies suggested that focal firms should integrate the strategic supplier (i.e. if critical or nonstandard) in the early stage of new product development to identify possible problems and solutions in the process of new product development (Handfield et al., 1999; Monczka et al., 2000). In addition, previous studies also defended the adoption of inter-organizational communication between focal firms and their key suppliers in certain circumstances, for instance, when critical information related to strategic issue had to be shared; frequently, critical information would be intensively shared in face-to-face meetings; and that there should be close monitoring and mutual changes between firms (Krause and Ellram, 1997; Carr and Pearson, 1999; Paulraj et al., 2008). The present study further found that a focal firm often uses higher degree of information richness mechanisms (i.e. project meetings or peer-to-peer discussions) with fundamental suppliers for transferring knowledge in the early stage to lay the foundation of service because the development activities of these suppliers are related to the existing functional operation of case companies and cannot be separated from their development activities. Focal firms used higher degree of information richness mechanisms for transferring knowledge to collect greater information and clarify as early as possible their different functional requirements and integration problems.

In contrast, case companies used lower degree of information-richness mechanisms (e.g. formal contracts and written instructions) with non-fundamental suppliers such as e-shops and service content companies to transfer knowledge in the later stage to enrich the service content and expand the scope of the service. The developed written documentation became an important source for transferring knowledge between case companies and non-fundamental suppliers because the development task had already

been fully clarified and codified in developed documentation which transferred knowledge between firms. These suppliers could individually follow the written documentation to develop their service content, help the case company quickly introduce similar service content and expand the scope of the existing business operation.

However, there is a major difference between the two selected service developments when case companies chose a mechanism to transfer knowledge with non-fundamental suppliers (service content companies). In order to develop different business modules for the kiosk, case companies often used project meetings with different service content companies to develop new business modules in order to recurrent clarify their different requirements (i.e. both their existing service operation procedure and their IT system), to identify potential solutions for connecting the two systems and to further develop written documentation about the design of the client-interface and system connection to the point where the new business module could be launched on kiosk. After the first sample successfully developed a business module, the marketing staff of the case company used only a project meeting once or twice to discuss existing operation procedures and contract terms with the marketing staff of the service content company and then directly provided the written documentation to follow because the service content has been developed and operated on kiosk. Accordingly, the present study found that the degree of project newness may influence the choice of a mechanism for transferring knowledge. Focal firms may use with non-fundamental suppliers a higher degree of information richness mechanism for transferring knowledge when the degree of project newness is higher.

8.5 The intra-organizational routines for knowledge transfer in the development of two selected services

This section describes the intra-organizational routine within the convenience store chains and compares the differences and similarities in the case companies. This section does not discuss intra-organizational routine in two selected services separately because most of the convenience store chains have regular intra-organizational routines when they develop new services.

8.5.1 Company E

Two selected service developments (the online shopping with pick-up at store service and the multiple media kiosk service) were also set in motion by the marketing staff from Company E. The new service plan was proposed by the marketing staff and discussed in regular meetings at different levels (sectional, departmental and cross-departmental). The marketing staff gathered related information (e.g. competition analysis, potential partners and project requirements) to propose new projects and repeatedly discussed and evaluated new service plans within its sectional meetings. Then the new project was submitted to a departmental meeting for discussion after the section manager had agreed to the new service plan. After the departmental manager had accepted the new project and become familiar with its initial requirements, the departmental manager proposed a new service plan at a cross-departmental meeting and discussed it with different departments (e.g. those of IT, finance and training) in order to spotlight the requirements of the different departments, coordinate the essential resources and request the agreement of the senior managers. For example, the marketing department provided the requirements and procedures of the new service plan to the IT department in order to transform the marketing terms into IT functions and further develop the specifications in detail in developing the IT system.

After the senior manager decided to develop the new service plan, a project meeting was convened, involving staff from different departments (e.g. the marketing, IT, finance, training and store operation departments) and senior managers; these were held once a month in the development stage. Staff working on the project used the meeting to discuss the requirements from the different departments to identify potential problems, coordinate different functional tasks and contribute essential resources to developing new services. These staff members also used the project meeting to report progress and problems to the general manager. The senior managers could use the project meeting to coordinate the resource allocations and development schedules of the different departments. In addition, during the development, telephone and face-to-face discussions took place within project teams on the tasks and problems of the development as they affected the staff of the different departments. This was because some emergent problems needed immediate solution. One former member of the marketing staff from Company E stated:

"A new business plan was often suggested by marketing staff and discussed at

> *first within their own section and department. A\ new business plan would be submitted to formal meetings at different levels and discussed with related departments after the section and department manager had agreed on it. Formal project meetings would be set up involving the staff of different departments after the general manager had decided to develop the plan. A project meeting was held once a month in order to discuss problems and report progress to senior managers and the general manager."*

Since convenience store chains have a wide spread of stores, the head office of convenience store chain has to use a different intra-organizational routine to share related knowledge and procedures with store staff in order to operate a new service in each store of the chain. This is because the convenience store chain relies on store staff to introduce the new service to their customers. The store operation department developed and offered the operation manual to each convenience store every time a new service was released and the operational procedure changed. This department also used internal announcements twice a month to each convenience store to tell them about new services or changes in existing operations. Supervisors helped the staff of each store to understand the execution procedures and solve the associated problems. Every supervisor has to assist eight stores and control the service quality. Finally, the store staff were given training courses of different levels (i.e. training courses for new store staff, vice-store managers, store manager… etc) in order to fully understand the operational procedure for the various services. Each convenience store had an operation manual provided by the store operation department to teach store staff how to operate the new service. A former member of the marketing staff from Company E stated:

> *"Our company had a standard operating procedure (SOP) for developing new services and won a certification (ISO9002)… The store operation department added a new operation manual to each convenience store to teach the store staff how to operate the new service procedure… Internal announcements were made twice a month which told the convenience stores about the new services and promotion releases …The training department also developed different courses to different staff based on their position in order to train their staff to carry out the various service procedures."*

8.5.2 Company F

The demand to develop new services was proposed by the marketing staff; it used regular meetings at different levels (sectional, departmental and cross-departmental) for discussion and evaluation. The marketing staff proposed a new project and discussed its requirements at the sectional meeting (once a week), followed by the departmental meeting (once a week) and cross-departmental meetings with different departments to

integrate the various functional requirements of the departments and develop a possible development plan to put to senior managers. Senior managers would attend cross-departmental meeting and make their decisions on the proposed development plan. In the developing stage, project meetings involving the staff of different departments were held to discuss the development tasks, cross-functional coordination and development schedules after senior managers had decided to develop any new service. The project team was divided into different groups (e.g. IT, finance and marketing groups) on the basis of different functional developments. Each functional member used the sectional meeting and departmental meeting to coordinate the development tasks and report any problems with other groups, via the project meeting. For example, the marketing staff developed the project requirements and service procedures and submitted them to the IT staff. Then the latter provided what was necessary and offered possible solutions according to their analysis of the existing IT system and further developed specifications for developing it. One section manager from the marketing department stated:

> *"The new project was first discussed in a sectional meeting, followed by a departmental meeting and cross-departmental meeting in order to discuss the project requirements of the different departments. When the project meeting was held it involved the staff of different departments once a month after the senior managers had decided to develop the new project. For cross-functional coordination, different departments were grouped together to discuss function development and report development problems at project meetings."*

Moreover, the IT department offered training courses to different staff (e.g. the IT and marketing staff) of Company F to update their IT knowledge and operating procedure, First, after confirming the requirements, the IT department trained its staff in the related IT knowledge and the development process. Then the IT department provided training courses to department staff, often the marketing staff who proposed this requirement, to confirm the operation procedures and user interface. It also trained "seed staff" in the same courses because these "seed staff" had to provide training to the end users (the store staff). Finally, the IT department prepared the team in repairing the system before any new IT function was used in the stores. The repair team had to identify the problems which the convenience stores had put before them and provide the right solution. In order to train new IT staff, the IT department electronically set up project files, which they authorized departmental staff to access. These project files included detailed specifications, checklists and minutes from meetings with different departments and

external partners.

In order to implement the new service in each convenience store, Company F also had a formal meeting with supervisors (once a month) in order to inform the supervisors of the release of new projects and their procedures before new service launch at each store. These supervisors would then help the store staff to understand and carry out the operation procedures (i.e. those for the kiosk and for the collection of payments) at the stores. At the same time, Company F informed each convenience store of the new service plans via regular twice-monthly internal announcements. The operation manual for new services was initially developed by the marketing staff and revised by the store operation department. It can be seen as a reference source when training store staff how to carry out the new service procedure. Finally, the training department of Company F also offered training courses to store staff to enable them to perform their allocated tasks.

8.5.3 Company H

The demand to develop new services was often proposed by marketing staff and discussed in meetings at different levels, departmental and cross-departmental, in order to make the different functional requirements and possible service operation procedure clear when developing new services. After senior managers had agreed with any proposition to develop a new service, Company H often formed a project team and assigned a project manager to oversee progress in the developing stage. Different departments (i.e. the IT, marketing, training, store operation) each assigned one person to the project team to coordinate its functions with the others. The different departments which were responsible for developing this service held project meetings at different stages of the development. For example, the project team belonging to the general manager's office was chosen in the idea generation stage of the MMK service development because it was easy for it to coordinate the knowledge and resources of different departments. In the system development stage, the project was managed by the IT department and it oversaw the progress of the development. Finally, the project was managed by the marketing department, when it developed different business modules in the commercialization stage. One of marketing managers from Company H said:

> *"Our company often got a team together to develop this service and different departments took more responsibility in different stages. The team was managed*

> *by general manager office in initial design stage, to integrate different opinions from different departments. After that, the leadership of the project team was transferred to the IT department in the second stage because the software system and hardware development are important elements at this stage. Finally, the leadership of the project team was transferred to the marketing department because what was needed was to develop business modules and promote the service."*

At the project meeting the schedules and tasks of the different development stages were set up, different functional requirements were discussed, potential problems from different departments were identified and progress was reported to the senior manager. For example, marketing staff indicated what the function demand was and discussed it with IT staff in order to develop the right specifications. The marketing staff and the store operation staff also discussed with one another the existing operating procedure at each store. Then the project members had to report the development tasks to the appropriate department and discuss their schedule for functional development within the department. Minutes were submitted to team members and senior managers after discussion at a formal meeting. Email, telephone and peer-to-peer discussions were used to discuss unexpected problems between team members. A project file in each case was established in electronic format, which included specifications, minutes and operation procedures for knowledge sharing. An operation manual was also provided from the chain's operation department to each store because the staff there had to understand and carry out the operation procedure. Electronic announcements were also regularly provided by the store operation department to inform store staff about the introduction of new services and possible problems. As noted above, the training department provided training courses to the store staff to familiarise them with the new services. A member of the marketing staff from Company H said:

> *"Developing new services was discussed and developed by project meeting in order to communicate and integrate different opinions from departments…. Project meetings involved different departments' staff based on different task developments. Minutes would be provided to team members and senior managers for confirmation. All the team members had to report on areas related to their department and staff. … Operation manuals, internal periodicals and training were also provided to the store staff for each service."*

8.5.4 Company O

Developing new services was often discussed at regular formal meetings within the proposed department. Followed by formal meetings with other departments to see what

their functional requirements were and identify possible ways of meeting them. Then the new project plan was proposed to the monthly cross-departmental meeting in order to assess the requirements new services to be developed and coordinate the essential resources from different departments (e.g.IT, finance and store operation). Senior managers and department managers discussed these and set up a schedule for developing any new project if it was accepted. In the development stage, department managers would inform department staff of their functional tasks and execute tasks via different levels of formal meetings within their department after the cross-functional meeting had assessed them. Telephone and face-to-face discussion were used to discuss problem-solving in detail between departments as new services were developed. Before the new service launch at each store, the store operation staff provided internal announcements (once a month) and an operation manual to inform store staff about the operation procedure of the new service before it began to operate in each convenience store. The head office also provided training courses to store staff in order to give them hands-on experience of the new service. A member of the marketing staff from Company O said:

> *"Our company had formal meetings for new project assessment once a month. This meeting involved senior managers and department managers discussing a new project plan which had been proposed by the marketing staff. Participants could give their opinion of the new project before making a decision... Related department managers would inform and allocate development tasks to their departmental staff after a decision had been made at a formal meeting to develop the new project plan... Our company also offered an operation manual to the convenience stores in order to teach their staff how to operate the new project … Internal announcements were provided once a month in order to inform the stores of their new business plans, which were put into action the following month."*

8.6 Cross-case comparison of case companies in the use of intra-organizational routines

Based on the above discussion regarding the use of intra-organizational routines for transferring knowledge in developing new services, this section compares the differences and similarities in different case companies. According to the findings of previous research, the demand to develop new services often has a market-pull orientation (Nijssen et al., 2006; Fasnacht, 2009). This present study found that the demand for the two selected service developments was proposed by the marketing staff of the case companies as a matter of market (consumer) demand. The marketing staff collect the related information from different sources (e.g. the industrial development

experience of a foreign country, competitors and an internal analysis of consumers' behaviour) and create new business plans. In particular, case companies established IT system to analyze consumers' behaviour in order to understand consumers' potential demands and satisfy them. Moreover, the present study found that case companies recurrent use higher degree of information richness mechanisms (i.e. formal meeting and informal peer-to-peer discussion) to clarify different functional requirements and tasks and to assess and adjust possible solutions until a service is formally launched in the stores. This is because the members of functional staff have not fully realized what kinds of resources and knowledge must be acquired to contribute to the development of new services. The functional staff must gather greater information from other functional staff (e.g. the members of the IT system, finance and store operation) and external companies in order to initially clarify the development requirements, evaluate the essential resources required and assess potential problems through formal meetings at different levels before deciding to develop a new service. Senior managers would be involved in cross-functional meetings to discuss possible development plans with different department managers and to assess the investment of essential resources in this regard. After a decision has been made, the staff of different departments (e.g. marketing, IT system, finance, store operation...etc) attended a project meeting with senior managers to transfer different areas of domain knowledge to different functional staff, to coordinate different functional tasks, and to continuously adjust the plans for service operation procedures in the development stage until the service is launched at the stores. Then project workers told their departments about the development tasks and organized staff from their departments to perform the functional tasks and identify the essential resources required from external companies. Between project meetings, different functional staff also held telephone and face-to-face discussions to share relevant knowledge, to identify development problems and to find possible solutions.

In particular, the intra-organizational routines for transferring knowledge between the head office and each store of a case company are important, before a new service is launched at a store. The head office relies on the store staff to directly provide the new services for the consumers. The store staff must therefore fully understand the service operation procedure or they cannot help the consumers. The store operation department of the case company translates the operation procedure of the new service into formal documentation (i.e. internal announcement and operation manual), a lower degree of

information richness mechanism for transferring knowledge, to quickly inform each convenience store about the new service project and teach the store staff about it. In addition, the head office also uses complementary training by the supervisors (a higher degree of information richness mechanism for transferring knowledge) to empirically teach and confirm that store staff fully understand the standard operation procedure of the new service and can operate it accurately. The supervisor is informed and trained in the operation procedure of the new service so as to pass on the knowledge to the store staff. Previous studies argued that the choice of higher degree or lower degree of information richness mechanisms can be determined by the extent to which knowledge is between franchisor and franchisees (Gorovaia and Windsperger, 2010). This present study has further clarified that case companies used lower degree of information richness mechanisms (i.e. internal announcement and operation manual) for transferring knowledge to quickly tell store staff how to operate the new service and provide it to the consumers. In addition, case companies also used a higher degree of information richness mechanism for transferring knowledge (training by supervisor) to train staff in person and confirm that each store's staff could operate new service accurately, even though an operation manual had already been issued. Multiple mechanisms for transferring knowledge are used between franchisor and franchisees in the process of new service development.

8.7 The relationship between organizational routines and the speed of new service development in the development of two selected services

8.7.1 Online shopping with pick-up at store service

With regard to the influence of organizational routines on the speed of new service developments, the present research found that the IT system supplier of Company E followed standard development procedure and recurrent used many project meetings, which may have increased the development time for the IT system of the new service. Standard development procedure can be seen as a guide to the different steps to be taken done in order to reduce the possibility of development failure, but simultaneously increase the inflexibility of interactions between individuals. The IT system supplier uses a series of project meetings to gather more information and exchange differentiated knowledge with different functional actors (e.g. the convenience store chain and

logistics staff) in order to clarify the different functional requirements and to adjust possible solutions until they are in a state to be implemented. This is likely to increase development time. A previous member of the marketing staff of Company E stated:

> *"IT system supplier currently adopted standard development procedure in developing a new IT system or function. It repeatedly used formal meetings to clarify and confirm the project requirements in detail with different actors in order to reduce the possibility of development failure. This may have added to the time required to develop a new IT system or function."*

The present research found empirical evidence that the IT system supplier of Company E followed a restricted development procedure and recurrent used project meeting (higher degree of information richness of knowledge transfer mechanism) to clarify essential information and requirements with different actors (e.g. convenience store chain and logistics) and then transformed the different functional requirements it had been given into its IT-based specifications when it developed the main IT system of the new service. The IT system supplier also followed the development procedure to improve the developed IT system when a new functional development required it. According to previous research, any task with a high proportion of new elements must be completed by collecting rich information from different individuals or organizations, in terms of information processing view (Verworn, 2009). Thus, the IT system supplier followed standard development procedure and recurrent used project meetings to gather greater information, to exchange differentiated knowledge and to adjust possible solutions with different actors in order to lower the possibility of development failure when a project contained many new elements. This may have increased the time required to develop the main IT system of the new service.

Moreover, the present study looked further into the process of inter-organizational routine for knowledge transfer and found that the lack of common knowledge between individuals may increase the frequency with which inter-organizational routines are used, leading to more time being needed to develop new services. According to previous studies, five types of common knowledge can be used to transfer and integrate knowledge, namely: language, other forms of symbolic communication, the commonality of specialized knowledge, shared meanings and the recognition of individual knowledge domains (Grant, 1996). The differences of perception in project requirements and problem-solving between individuals of different firms mean that

project meetings must be used to reduce the perception difference between individuals. The problem of perception difference is often caused by the lack of commonality of specialized knowledge between different functional staff (e.g. IT and marketing) to represent their requirements and problems. For example, IT staff often use IT terms to illustrate their requirements and problems but marketing staff and logistic staff may not understand what these terms mean. Staff from different companies have to meet and discuss the same problems many times, which slows down the rate at which new services develop. A manager from a third party logistics company said:

> *"When our company had discussions with other companies (e.g. IT suppliers), our company had different perceptions of what one sentence of the project requirements meant. Our company and its partner firms had different domain knowledge, which resulted in different thinking on the same issue. This problem took some time over reducing the cognition distance in its project meetings."*

The problem of perception difference can be reduced by pre-meetings (informal peer-to-peer discussion) between different functional staff, which can be used to discuss perception differences and reach consensus. These can very often save the time taken by formal meeting between firms and reduce the frequency of using formal meeting.

With regard to the same issue within the convenience store chains, the marketing staff and IT staff lacked a commonality of specialized knowledge for discussing project requirements and translating them into different functional meanings. The reason is that IT staff often use domain knowledge to represent project requirements and identify service procedure with other functional staff (e.g. marketing staff and finance staff). Marketing staff also use domain knowledge in this regard to represent the functional requirements and service procedure to the IT staff. Time and money may be spent on confirming requirements with different functional staff. One member of the marketing staff from Company F also stated:

> *"The marketing staff did not realize how to transform requirements into specific IT language. The IT staff often spent a good deal of time on confirming requirements in detail (i.e. on user-interface and data transfer between different systems) and transforming these into IT meanings."*

In order to overcome this problem, the IT staff and marketing staff would report this problem to their respective senior managers (i.e. the sectional manager and departmental manager). The senior managers of the IT and marketing departments used pre-meetings to air the different perceptions and confirm the requirements on both sides.

Previous studies have argued that the common knowledge allows individuals with a common ground to transfer and integrate different domain knowledge effectively (Nonaka, 1991; Grant, 1996; Hirunyawipada et al., 2010). On the basis of this research finding, the present research found that the common knowledge existing between individuals plays an important role in the organizational routine for enhancing the transfer of knowledge between individuals. This is because the routine gives participants an opportunity to explore the different interpretations between participants and achieve a common understanding (Feldman and Rafaeli, 2002). The lack of common knowledge between individuals obliges participants to spend time on sharing different interpretations and reducing the cognition distance between participants, which all adds to the time taken to complete their task.

8.7.2 Multiple media kiosk (MMK) service

Exploring the same issue in developing the multiple media kiosk service, the present study found that convenience store chains used developed documentation (specifications about developing the client interface and system connection) to transfer knowledge once the first sample has been successfully developed in a new business module. This is because convenience store chain recurrent used project meetings with the first entrant to discuss the type of cooperation, identify the project requirements and recognize possible development problems in developing a new business module. Then the IT staff of the convenience store chain further developed the specifications of the client interface development and system connection and modulized this service content. When a convenience store chain cooperated with a service content company with a similar service content, the marketing staff of the former often provided developed documentation to service the content company in the work of developing a client interface and connecting the systems. It saved time when discussing the IT requirement and speeded up the development of new services by reducing the proportion of new elements to master. Moreover, the marketing staff of the convenience store chain also found it easier to discuss the service requirements and contract terms with the equivalents in the service content company because it was clear that the task could be done in a particular way dictated by previous experience. A marketing manager of Company H stated:

> *Our marketing staff first used project meetings with a service content company to discuss project requirements and involve IT staff in identifying the IT system*

> *requirements for system connection. Then our IT staff would further develop the specifications for the client interface and system connection and modulize the service content…. Our company would provide specifications to the service content company if it had a similar service content in order to develop the client interface and connect the systems. This can lessen the time needed for new project development in the same module.*

Previous studies argued that routine can be seen as a knowledge repository in a focal firm, which represents useful solutions to different tasks (Nelson and Winter, 1982; Teece and Pisano, 1994; Hodgson, 1998; Zollo and Winter, 2002). It also helps to understand how firms store, apply and change their productive knowledge. Productive knowledge may be held by individuals and organizations and stored in different ways (e.g. documents, databases and artefacts). In addition, the formation of routine reduces the time per replication within a specific task (Cohen and Bacdayan, 1994). The developed documentation (specifications about developing a client interface and system connection) can be seen as guidelines to service content companies which can provide similar service content for the kiosk to expand the scope of the existing business module. The present study found that developed documentation can accelerate the process of transferring knowledge between individuals and shorten the time taken by repeated discussion about the IT requirements of system connection and possible solutions when the degree of project newness is lower.

Moreover, the present research also found that the lack of common knowledge between individuals may also increase the frequency of using inter- and intra-organizational routine and further increase the time required to develop new services. The perception difference in problem-solving is the most important factor in the speed of developing new services. It is due to staff from different companies having different interpretations and perceptions of a project's requirements and its potential problems. In developing new services, both sets of staff may insist on their views on the basis of previous experience and stored knowledge of the various functional requirements and potential solutions. However, they have to meet and spend time on discussing potential solutions and reducing the cognition distance between these different perceptions through a project meeting many times; this all makes for less speed in the development of new services.

Furthermore, there is also a lack of common knowledge between different sets of

functional staff (i.e. marketing staff vis-à-vis IT staff) within a convenience store chain. The IT staff has to spend time on trying to understand the project requirements/tasks as described by the marketing staff and translate the terms into IT terms. This problem may arise when discussing development problems and confirming project requirements between different functional staff. It arises because marketing staff use its own specific terms to represent function demand and development problems with IT staff. Sometimes IT staff cannot fully understand the meanings of the functional requirements and find it difficult to transform these functional requirements into IT-based terms. They may spend much time and use many different mechanisms (project meeting and peer-to-peer discussion) to identify the development problems and coordinate the cross-functional solutions between different departments. However, this problem can be reduced by using project managers if the latter are familiar with both domains. The project manager can help to coordinate the project requirements between the marketing and IT staff and can control the rate of development. One member of the marketing staff from Company F stated:

> *"The lack of common knowledge between marketing staff and IT staff was apparent when the former discussed development tasks with the latter. Sometimes senior managers of different departments spend time on holding a meeting and coordinate development tasks, especially when confirming IT requirements."*

According to previous studies, however, if there is a stock of common knowledge between individuals it can improve the transfer of knowledge and enhance collaboration between individuals (Grant, 1996; Filiou 2007; Hirunyawipada *et al*., 2010). It can make the transfer easier and individuals can reach common understanding through a specific routine for completing the task.

8.8 Cross-case comparison between two services in the relationship between organizational routines and the speed of new service development

In its discussion of the relationship between organizational routines and the speed of new service development in two selected service developments, the present study found that the lack of a common knowledge between individuals may increase the frequency with which project meetings for transferring knowledge are used between firms and within a focal firm, leading to increased development time. The lack of a common store

of specialized knowledge may result in perception differences between individuals when participants follow a specific routine for transferring knowledge. For example, simple requirements proposed by marketing staff are not easy to transform into IT-based requirements. This problem is caused by previous experience, existing requirements/ service procedures and the different knowledge backgrounds of different functional staff. It may result in perception differences when confirming project requirements and recognizing problems. Different functional individuals need to use many project meetings to transfer knowledge between functional individuals in order to clarify the various functional requirements in detail and more clearly identify the different functional tasks.

Moreover, the present research found that if the IT system supplier followed standard development procedure and used project meetings to develop main IT system. It could increase the time needed to develop the online shopping with pick-up at store service. This is because the IT system development of this service must exchange and integrate different functional knowledge in order to transfer information between different actors (i.e. convenience store chain, the logistics company and the e-shop). IT system suppliers many times used project meetings with different actors in order to confirm the IT requirements and service procedures. Although IT system suppliers follow standard development procedure step-by-step in this work can lower the possibility of development failure, but they also have to use many project meetings to collect different functional requirements with different actors in order to complete different stages of a task. When projects contain many new elements, individuals must recurrent use project meetings to gather and confirm different functional requirements in order to take all the necessary steps in a specific task. This may add to the development time.

Finally, the present study found that documentation was adopted for transferring knowledge in order to effectively involve similar content companies and further expand the scope of the existing business module for the kiosk when the degree of project newness is lower. This is because the case company many times used project meetings to discuss the requirements of new business (including contract terms, user interface development and system connection) with the first sample in order to develop the new business module. Both the IT staff of the case company and that of the service content company were also involved in project meetings both to discuss the IT requirements for

connecting the system and further to develop the specifications to modulize this service content. The follower was given the documentation to develop client-interface and to connect both systems, which saved the time needed for repeated discussions between individuals. Previous studies argued that routine can be seen as a knowledge repository in the firm and that it represents useful solutions to different tasks (Nelson and Winter, 1982; Teece and Pisano, 1994; Hodgson, 1998; Zollo and Winter, 2002). Productive knowledge may be held by individuals and organizations and stored in different ways (i.e. documents, databases and artefacts). Case companies many times used project meetings with the first entrant in order to acquire greater information and identify project requirements because the degree of project newness is higher. Then useful solutions for developing this business module can be noted and stored in documentation (i.e. specifications for system connection and client-interface design). The case company can save the discussion time with the second company when expanding the scope of the existing business module for the kiosk.

8.9 Summary

The main focus of this chapter was to identify how case companies use different organizational routines with external companies and within focal firms for knowledge transfer in two selected service developments. In particular, the relationship between organizational routines and the speed of new service development is explored in this chapter. Regarding the inter-organization routine for knowledge transfer in different tasks, the present research found that case companies often use higher degree of information richness mechanisms for transferring knowledge (i.e. project meeting or peer-to-peer discussion) with their fundamental suppliers (e.g. their IT system supplier and logistics companies) in the early stage to process greater information and constitute the foundation of the two service developments because the development activities of these suppliers cannot be separated from the development activities of the case companies. In contrast, case companies used lower degree of information richness mechanisms (i.e. formal contract and written instruction) for transferring knowledge with non-fundamental suppliers (i.e. e-shops and service content companies) in the later stages to enrich the service content and expand the scope of a service. Moreover, the present study found that, in the development of the MMK service, the degree of project newness may influence which mechanism is adopted for transferring knowledge. A

focal firm may use a higher degree of information richness mechanism for transferring knowledge with non-fundamental suppliers when the degree of project newness is relatively new, in order to acquire rich information and modulize the different service contents for the kiosk.

Moreover, the present study found that in developing new services, case companies often used a higher degree of information richness mechanism for transferring knowledge (face-to-face meeting) across different levels (sectional, departmental and cross-departmental) within their firms in the decision-making process. The mechanism for transferring knowledge can facilitate its movement between different functional staff so that they all understand the initial requirements from the firm's different departments and assess possible solutions. In addition, case companies also used higher degree of information richness mechanisms for transferring knowledge (project meeting and peer-to-peer discussion) in the developing stage of new service projects to transfer knowledge between various functional members of staff and external companies, to coordinate different functional tasks and to adjust possible solutions. Regarding the intra-organizational routine for knowledge transfer between the head office of a case company and each convenience store, the present study found that multiple mechanisms are used between franchisor and franchisees in the process of developing new services. Case companies used lower degree of information richness mechanisms for transferring knowledge (i.e. internal announcement and operation manual) to quickly inform store staff and conversely adopted a higher degree of information richness mechanism (training by supervisor) to empirically teach and confirm that the store staff could accurately operate the new service.

Furthermore, the present study further investigated the relationship between organizational routines and the speed of developing new services in the development of the two selected services. It was found that the lack of common knowledge between individuals may increase the frequency with which project meetings between firms and within focal firm have to be used for transferring knowledge, leading to the need for more development time. In addition, the present research also found that if IT system suppliers applied a higher degree of information richness mechanism (e.g. project meeting) for transferring knowledge and followed existing development procedures to develop the main IT system, it might increase the development time required to develop

the online shopping with pick-up at store service. The IT system supplier has to follow a strict development procedure and recurrent use project meetings to exchange differentiated knowledge and clarify functional requirements with different actors in order to complete the different steps of the task and reduce the possibility of development failure when a project is relatively new. Finally, the present study found that useful solutions for developing one business module can be represented and stored in documentation (i.e. specifications for system connection and client-interface design). Case company thus need not waste time on discussing service requirements with the second company to expand the scope of the existing business module for the kiosk, because the proportion of new elements is to this extent lower.

Chapter 9: Conclusions and Managerial implications

9.1 Introduction

This thesis examines how inter-firm relationships and organizational routines influence the outcome of new service development (NSD) and further investigate how different types of new service development affect this issue. Although previous studies have identified many advantages of open innovation (Chesbrough, 2003; 2006) and empirical evidence in new product development has been drawn upon (such as Fetterhoff and Voelkel, 2006; Dittrich and Duysters, 2007), there is less empirical evidence in the service sector to show how a firm with an open innovation approach adopts different types and degrees of inter-firm relationship with external firms in order to acquire essential resources and control development risks, such as the leakage of sensitive knowledge and increased transaction cost (e.g. searching and monitoring cost). Moreover, a firm to establish organizational routines/insource mechanisms to help acquire the relevant knowledge from external firms and further make the knowledge flow into appropriate departments and staffs is very important for value creation. However, this issue is still being developed with reference to the open innovation approach. The present study investigates the ways in which firms, in order to contribute to open innovation, adopt different inter-firm relationships with different suppliers and why; and how firms adopt different levels of organizational routine to transfer knowledge between their cooperative firms and within themselves.

To attain these research objectives, the present research adopted the following process. First, the relevant literature and research were reviewed in Chapter 2. In order to understand how firms use and manage different inter-firm relationships with external firms in the process of developing new products and services, the concept, advantages and potential problems of open innovation and the literature from networks and collaborations in innovation were reviewed. The sectoral system of innovation was reviewed to analyze the source of innovation and linkages between the actors in the Taiwanese convenience store industry. The literature regarding innovation in the service sector was also reviewed to clarify the similarities and differences between the manufacturing and service sectors and to identify the relevant dimensions of service innovation in two selected projects. Moreover, the concepts and mechanisms of organizational routine at the inter-and intra-organizational level were reviewed to

discover which routines/in-source mechanisms firms adopt a transfer of knowledge between firms and further make this knowledge flow to the appropriate departments and staff within firms.

In Chapter 3, a theoretical framework was developed to investigate how inter-firm relationships and organizational routines influence the outcome of new service development, the focus of this research. Based on the findings of the pilot study, the present research identifies three main factors (i.e. intensity of inter-firm collaboration, interdependence and trust) to investigate how firms use different types of inter-firm relationship to cooperate with external firms and manage inter-firm collaboration in the process of new service development and further explore how this issue is associated with the speed of this development. Accordingly, definitions of the three main factors were reviewed and the relationship between these factors and the speed of new service development was proposed in accordance with previous research in new product development. The performance measurement of new service development was reviewed and then, to evaluate development outcome, speed measurement was selected, which identified the time taken from the concept to the service launch. Finally, the influence of organizational routine on organization was reviewed in order to set out some expectations in the relationship between organizational routine and the speed of new service development.

In this research, a comparative case study was designed, which drew on empirical evidence from the development of two types of e-commerce service (i.e. the online shopping with pick-up at store service and the multiple media kiosk service) in the four dominant convenience store chains in Taiwan. The development of two selected services involved different degrees of task complexity and project newness. The present research also adopted the scheme of formal and informal relationships which was proposed by Dahlander and Gann (2007), to clarify the different degrees of openness adopted by the four convenience store chains in the process of new service development. In developing their new services, Companies E and F established different degrees and types of relationship with greater degrees of openness than Companies H and O. Documentation and semi-structured interviews were used to collect information from the members of staff of convenience store chains and suppliers. The interviews were analyzed using the thematic framework approach, which represents the patterns and

relationships in the interview data. Cross-case synthesis was chosen as the analytical technique to summarize the findings from the individual cases. This technique was also useful in identifying the similarities and the differences between the two service development projects.

In this final chapter, the main research findings relevant to each question and key contribution to literature are discussed in section 9.2. Then the managerial implications are addressed in section 9.3. Finally, section 9.4 describes the limitations of the present study and offers some suggestions for future research.

9.2 Discussion - Key findings and theoretical contribution

In this section, we discuss how the research findings address each of the three research questions and identify the key contributions to the relevant literature.

9.2.1 How do different types and degrees of inter-firm relationship influence the outcome of the NSD?

This question was discussed in Chapter 6 and Chapter 7. In order to address this research question, three main factors were considered, namely, the intensity of the inter-firm collaboration, interdependence and trust, showing how case companies adopt different types and degrees of inter-firm relationship with suppliers and those factors which influence the speed of new service development. First, the issue of how case companies adopt different types and degrees of inter-firm relationship with suppliers was discussed in sub-section 9.2.1.1. Then the issue of how different types and degrees of inter-firm relationship affect the speed of new service development was addressed in sub-section 9.2.1.2.

9.2.1.1 The adoption of different types and degrees of inter-firm relationship in NSD

The present research adopts a classification of intensity of inter-firm collaboration based on Fliess and Becker’s (2006) research and incorporates the classification of coordinated development from Petersen et al. (2005). Three important forms of inter-firm cooperation were examined, i.e. contract development, coordinated development and joint development. The empirical results show that the adoption of different degrees of intensity of inter-firm collaboration with external firms depends on

the degree of task complexity. Case companies used a higher degree of intensity in their inter-firm collaboration with suppliers in developing fundamental functions (e.g. IT and logistics) in the development of the two selected services, because the development activities of these suppliers cannot be separated from the case company's development activities. Moreover, case companies also adopted a lower degree of intensity of inter-firm collaboration with non-fundamental suppliers (e.g. service content companies and e-shops) because the development activities of these suppliers can be simply defined in their object, provision and restriction and can be separated from case companies' development activities. This is consistent with the argument of a previous study that the intensity of inter-firm collaboration is high when the task is more complex (Nylen, 2007). However, the previous research focused only on the degree of involvement and interaction among cooperative firms. The issue of firms' responsibilities and decision-making on the specification in different degrees of intensity in inter-firm collaborations (coordination, co-operation and integration) is still neglected. The present study further used different forms of inter-firm collaboration to identify the intensity of different cooperating firms, which helped to distinguish more clearly the different firms' responsibilities and decision-making in inter-firm collaboration. Moreover, the empirical results also show that the degree of project newness influences the choice of degree of intensity of inter-firm collaboration when case companies cooperate with non-fundamental suppliers to expand the scope of a new service development. A firm often uses more intense inter-firm collaboration with the first entrant to identify potential problems and reduce the technological uncertainty so as to develop a new business module. Then the firm can adopt a lower degree of intensity of collaboration with suppliers who can provide similar service content because the project is no longer so new.

The present research identifies two sources of inter-firm dependence, that of unique, valuable resources (Das and Teng, 2000; Gulati et al., 2000) and that of switching costs (Williamson, 1979, 1985; Whitten and Wakefield, 2006; Kim et al., 2010), to identify the interdependent relationship between case companies and their suppliers in the development of the two selected services. The empirical results show that the interdependence between case companies and their suppliers in developing fundamental functions (e.g. IT and logistics), high switching cost and high asset specificity can be seen as important elements in interdependence for both service developments. Case

companies also use ownership or incentive rewards to contribute to their mutual dependence and reduce opportunism. In contrast, the case company has an interdependent relationship with its non-fundamental suppliers (e.g. e-shops, service content companies) based on valuable resources and knowledge. This is because the case companies do not have enough resources and knowledge to develop so much service content by themselves. Additionally, the empirical results also show that the interdependence between case companies and these suppliers tends to vary (between asymmetrical and mutual) in terms of the numbers of alternatives and amount of essential resources required.

The present research adopts Sako's (1992) typology of trust, including contractual trust, competence trust and goodwill trust to identify the different types of trust between case companies and their suppliers in the development of the two selected services. The empirical results from both the new service developments show that the trust between case companies and their suppliers in developing fundamental functions is on the basis of previous cooperative experience between firms. These suppliers fully understand the case company's development routine and requirements, leading to increased predictability in the behaviour of the case company. At the same time, case companies have also recognized and understood the suppliers' capability on the basis of long-term experience of cooperating with them, leading to reduced costs for searching and monitoring. The trust between firms leads to lower transaction cost, because the possibility of opportunism is reduced and with it the transaction cost, while the partner's behaviour becomes increasingly predictable (Zaheer et al., 1998). Moreover, case companies may cooperate with suppliers on the basis of competence trust when they have no prior experience of cooperating with them because suppliers' good capability can be enough to help limit the technological or market uncertainties for case companies in the process of developing new services.

Further, the empirical findings also show the difference in the trust built between case companies and non-fundamental suppliers in two types of service development. In the online shopping with pick-up at store service development, the trust between the case company and the e-shops was on the basis of the contract terms set in order to control the service quality provided by the e-shops and to protect the case company's goodwill. In contrast, the cooperation between the case company and the service content

companies was on the basis of previous cooperation experience and the supplier's good capability for building trust. The case company cooperated with the suppliers to expand the scope of the existing business module on the basis of their previous experience of cooperation. Moreover, the supplier's good capability is another important factor for trust building when the case company cooperates with suppliers to develop new business modules for the kiosk.

In addition, the empirical results show that inter-personal trust is the foundation of the trust built between a case company and its suppliers in the development of the online shopping with pick-up at store service. Both sets of staff had long-term experience of cooperation, which may increase the predictability and reliability of peers' behaviour in a new project development and reduce the difficulty of negotiation in the development process because peers believe that the information provided by their counterpart is not misrepresented.

In conclusion, the present study provides a better understanding of the way in which a firm uses the combination of different inter-firm relationships with different suppliers (fundamental and non-fundamental) to create value and reduce development risks in the open innovation approach. In addition, the present work also indicates that the adoption of combinations of different inter-firm relationships with different suppliers may be influenced by the different characteristics of a task (i.e. different degrees of task complexity and of project newness) in the development of different types of new services.

9.2.1.2 The relationships between different types and degrees of inter-firm relationship and the speed of new service development

The relationship between the intensity of inter-firm collaboration and the speed of new product development is inconclusive in the literature on new product development. Some studies suggest that a high degree of intensity of inter-firm collaboration has a positive relationship with the speed of new product development (Zahra and Nielsen, 2002; Fliess and Becker, 2006). Comparatively, some studies argue that there is no positive relationship between the intensity of inter-firm collaboration and the speed of new product development (Littler *et al.*, 1998; Von Corswant and Tunälv, 2002). In addition, there is less empirical evidence to investigate the relationship between the

intensity of inter-firm collaboration and the speed of new service development. The present study found empirical evidence that a higher degree of intensity of inter-firm collaboration has a negative influence on the speed of new service development (in particular, the development of the IT system), which is consistent with the arguments of previous studies in new product development (e.g. Littler et al., 1995; Littler et al., 1998). Intensively cooperation between a firm and its fundamental suppliers may increase the time spent on new service development.

Most of the previous studies focused on the way in which the dependence between firms influences the quality outcomes in the literature of new product development (Haile´n et al., 1991; Takeishi, 2001). For example, Takeishi (2001) proposes that a supplier whose sales greatly depend on a buyer can achieve a high degree of performance outcome (design quality). Moreover, a supplier's dependence on his buyer firm reduces the uncertainty in the buyer's decision-making process (Gao *et al*., 2005). The relationship in new service development between interdependence and development speed is still being developed. The empirical results show that the interdependence has a positive influence on the development speed, whatever different dependent relationship (asymmetrical or mutual) exists between cooperative firms. Mutual dependence between a case company and its suppliers can reduce opportunism and control development progress, in turn increasing the speed of new service development. Mutual dependence between a case company and its fundamental suppliers can strengthen the motivation to cooperate and share valuable resources/knowledge with partners, which reduces the time required to develop a new service. Moreover, the present study further found empirical evidence that a case company may have an asymmetrically dependent relationship (the supplier is highly dependent on the focal firm) with non-fundamental suppliers. These suppliers are willing to share related knowledge and speed up their development schedule to meet the requirements of the case company in order to acquire essential resource from the latter, to promote its reputation in its domain and to increase turnover, which in turn, leads to a reduction of the development time required. Accordingly, the present research provides a better understanding of the relationship the interdependence and development speed under different dependent relationships (asymmetrical or mutual) between firms in the development of new services.

As regards the relationship between trust and development speed in the literature on new product development, a few studies state that a high level of trust between cooperative firms has a positive relationship with time efficiency (Bonaccorsi and Lipparini, 1994; Bstieler, 2006). Moreover, Bstieler (2006) found that if some antecedents, including partner firms, work together in an honest and frank manner, keep their promises, make no unwarranted claims and support each other, they promote the trust building between firms which has positive influence on time efficiency. However, the relationships in the field of new service development are still under-explored. The empirical findings show that trust between firms can speed up the new service development on the basis of previous experience of cooperation between firms and the supplier's good capability in a specific domain. The previous experience of cooperation between firms and the supplier's good capability can promote trust building between firms, which positively influences the speed of new service development.

Moreover, a few studies in the literature on new product development have found that interpersonal trust has a positive influence on effectiveness at the inter-organizational level (Zaheer et al., 2002) and at project level (Massey and Kyriazis, 2007). The present study found that the antecedent of previous experience of cooperation between individuals can promote trust building between individuals, which speeds up new service development. Individuals working in cooperative firms who had previous experience of cooperation and interaction can increase the predictability of other individuals' behaviour and increase their belief about their counterparts' reliability, competence and dependability, leading to a saving of time and effort on monitoring. Accordingly, the present study found that there is a positive relationship between trust and development speed in the development of new services, which is consistent with the literature on new product development. Then the present research further offers evidence that some antecedents can promote trust being built on the inter-organizational and interpersonal level and, further, positively affects the development speed in the process of new service development.

9.2.2 How do different types of organizational routines influence the outcome of the new service development?

According to previous studies (Dalander and Gann, 2007; Vanhaverbeke, et al., 2007), focal firms need to develop routines/in-source mechanisms for knowledge transfer

between firms and further make this knowledge flow to the appropriate departments and staff within focal firms. Thus, the organization routines for knowledge transfer at different levels (inter-organizational and intra-organizational) were examined. Previous research found that firms used such inter-organizational routines as regular meetings, visits, telephoning and peer-to-peer discussion for transferring knowledge between firms (Dyer and Nobeoka, 2000; Mante and Sydow, 2007) and within the focal firm (Mante and Sydow, 2007; Hale and Tidd, 2009). Additionally, some studies argued that these different mechanisms in organizational routine possess different degrees of information richness for transferring knowledge between firms and within firms in the process of developing new products (Daft et al., 1987; Sheer and Chen, 2004). When a mechanism has more attributes, including feedback capability, language variety, availability of multiple cues and personal focus, it can be identified as higher in information richness and having greater capacity to transfer knowledge. In this section, (sub-section 9.2.2.1) the issue is discussed of how case companies adopt different levels of organizational routine (i.e. inter-organizational and intra-organizational) for knowledge transfer with different suppliers. Then the issue of how these different levels organizational routine affect the speed of new service development is addressed in sub-section 9.2.2.2.

9.2.2.1 The adoption of different levels of organizational routine for knowledge transfer in new service development

According to previous studies of new product development (Handfield et al., 1999; Monczka et al., 2000), firms should integrate the strategic supplier (i.e. if critical or nonstandard) in an early stage of new product development to identify possible problems and solutions in this process. As regards the adoption of different levels of organizational routine for this task, the empirical results show that case companies often used a higher degree of information richness mechanisms for transferring knowledge (e.g. project meeting or peer-to-peer discussion) with fundamental suppliers (e.g. the IT system supplier and logistics) in the early stages to constitute the foundation of new service development. Conversely, case companies used a lower degree of information richness mechanisms for transferring knowledge (e.g. formal contracts and written instructions) with their non-fundamental suppliers (e.g. e-shops and service content companies) at a later stage to quickly enrich the service content and expand the scope of the service.

Moreover, some studies in new product development argued that there should be close monitoring and mutual changes between firms and that focal firms adopt inter-organizational communication with their key suppliers in certain circumstances, for instance, when critical information related to a strategic issue had to be shared, this would be done face-to-face (Carr and Pearson, 1999; Paulraj et al., 2008). However, the issue of what factor influences the adoption of inter-organizational communication mechanisms between focal firms and their non-fundamental suppliers is still being developed. The empirical findings show that the degree of project newness may influence the adoption of mechanisms with higher or lower degrees of information richness for transferring knowledge. Case companies may use a higher degree of information richness for in transferring knowledge with non-fundamental suppliers to clarify different functional requirements when a project has a higher proportion of new elements. The present research found empirical evidence in the development of new services that the adoption of different degrees of information richness mechanism for transferring knowledge between case companies and their non-fundamental suppliers is affected by different degrees of project newness.

According to previous studies, the demand to develop new services often has a market-pull orientation (Nijssen et al., 2006; Fasnacht, 2009). This present study found that the demand for the two selected service developments was proposed by the marketing staff of the case companies as a matter of market (consumer) demand. The members of the marketing staff collect the related information, create new business plans and then informally discuss their ideas with different department. Through the formal development process in making decisions, case companies used a higher degree of information richness mechanism for transferring knowledge (regular meetings at different levels) to discuss new project requirements and to assess potential problems within a department and across departments Then a project meeting was set up, involving the staff of different departments and their senior managers to discuss different functional requirements, to coordinate different functional tasks with different departments and external companies and to modify possible solutions during the development stage. The present research provided a better insight into the adoption of different degree of information richness mechanisms for transferring knowledge between appropriate departments and member of staff within focal companies in different stages of new service development.

In particular, before a new service is launched at stores, the intra-organizational routines for transferring knowledge between the head office and each store of a case company are important in this sector. Previous studies have argued that the choice of different degree of information richness mechanisms can be determined by the extent to which knowledge is between franchisor and franchisees (Gorovaia and Windsperger, 2010). The empirical finding shows that multiple mechanisms for transferring knowledge are used between the head office of a case company and each convenience store before the launch of the new service launch at all the stores. In the present research, case companies used a lower degree of information richness mechanism for transferring knowledge (e.g. internal announcements and an operation manual) to quickly inform store staff and correspondingly adopted a higher degree of information richness mechanism for transferring knowledge (training by supervisors) to empirically teach store staff and confirm that they could operate the new service accurately.

In conclusion, the present research used the concept of information richness to operationalise the capacity of knowledge transfer. Thus it offered a better understanding of the adoption of different degree of information richness mechanisms for knowledge transfer between cooperative firms and within case companies in different stages of new service development.

9.2.2.2 The relationship between organizational routine for knowledge transfer and the speed of new service development

According to previous studies in the literature on new product development, a common store of knowledge can help in transferring knowledge and enhance cooperation between individuals (Grant, 1996; Hirunyawipada et al., 2010). Focusing on the issue of how organizational routine influences the development speed in new service developments, these empirical results show that in this context the perception difference between individuals appeared in inter- and intra-organizational routines for knowledge transfer in the process of new service development. The perception difference between individuals may derive from the lack of commonality of specialized knowledge. The present research found that the lack of common knowledge between individuals may increase the frequency of the mechanisms of organizational routine (e.g. project meetings) for transferring knowledge between firms and within a focal firm, leading to

increased development time in new service development. Accordingly, the lack of commonality of specialized knowledge between individuals is an important factor for knowledge transfer and further influences the development speed in the process of new service development.

Moreover, previous studies argued that organizational routine can generate stability and adaptability through the shared understanding between individuals (Feldman and Rafaeli, 2002; Feldman and Pentland, 2003). The shared understanding between individuals also constitutes the procedural memory which specifies how things are done in particular ways. Moreover, some previous studies (e.g. Reason, 1990; Postrel and Rumelt, 1992) argue that organizational routine can simplify and accelerate the process of knowledge transfer and decision-making. However, there is less empirical evidence about the relationship between organizational routines and the speed of new service development. The present research found that individuals have to recurrently use higher degree of information richness mechanisms (e.g. project meeting) when a project has many new elements. This may lead to more time being required for a new service development because individuals have to gather more information and clarify different functional requirements with other participants before completing the different steps of a specific task. Conversely, the empirical results also found that lower degree of information richness mechanisms for transferring knowledge (e.g. documentation) are adopted when the proportion of new elements in a project is lower. This may lead to less time being required for a new service development because individuals can save time on clarifying different functional requirements with other participants and directly follow existing, mature solutions for developing it. Accordingly, the development speed of new service development is associated with the adoption of different mechanisms of organizational routine under different degrees of project newness.

9.2.3 In what ways do the different types of service development affect the different types of inter-firm relationships and organizational routines associated with the outcome of new service development?

As stated in Chapter 5, the development of two selected services involved different degree of task complexity and project newness. The online shopping with pick-up at store service involved a higher degree of task complexity and used the existing distribution system and IT systems of convenience store chains and, from external firms,

integrated a different IT system which transfers information. The multiple media kiosk (MMK) service involved a higher degree of project newness to develop different business modules on kiosks. According to previous studies, they argue that greater project complexity increases development time in new product development (Meyer and Utterback, 1995; Griffin, 1997). This is because complex tasks have many steps and require many connections between different functions, which all take time. Moreover, some studies in new product development have argued that a higher degree of project newness may lead to project inefficiency because much information has to be gathered to contribute to the development of the new product (Moenaert et al., 1995; Verworn, 2009).

As regards the relationship between the intensity of the inter-firm collaboration and the speed of new service development, the present study found that case companies use intensive collaboration with fundamental suppliers (e.g. IT system suppliers) in developing the online shopping with pick-up at store service to accomplish the many steps of their complex tasks and integrate information across different functions, leading to increased development time. This empirical finding provides a better insight into the level of intensity adopted in inter-firm collaboration and the way in which this issue is associated with the speed of new service development under different degrees of task complexity. Moreover, in the development of the MMK service, the empirical results show that a lower intensity of inter-firm collaboration with non-fundamental suppliers (i.e. service content companies) may speed up the existing module developments when the projects are no longer so new. At the same time, case companies also used a higher intensity of inter-firm collaboration with non-fundamental suppliers to develop new business modules. Developing a new project is slower because they may need to spend some time on fitting the two IT systems together and on solving unexpected problems. This empirical finding provides a better understanding of the degree of intensity adopted in inter-firm collaboration and the way in which this issue is associated with the speed of new service development under different degrees of project newness.

Comparing the research findings in the relationship between interdependence and the speed of new service development, the empirical findings show that the interdependence between firms has a positive influence on the development speed, whatever the different dependent relationship (asymmetrical or mutual) between case companies and suppliers

(fundamental or non-fundamental) in the development of two selected services. Accordingly, the present research found that the different types of service development did not have great influence on the interdependence associated with the speed of new service development.

Moreover, the present study found that the high level of trust between firms speeded up the development of the two selected service on the basis of previous experience of cooperation between firms and the good supplier's capacity in these specific domains. Accordingly, the present research found that the different types of service development did not have great influence on the inter-organizational trust associated with the speed of new service development. Additionally, the present study found that when case companies developed the online shopping with pick up at store service, trust built on previous experience of cooperation between individuals had a positive influence on the speed of new service development at the individual level. This is because this service was continuously developed and improved over ten years, so that individuals on both sides had long-term experience of cooperation and interaction, which may increase the predictability of other individuals' behaviour and increase individuals' confidence in the reliability, competence and dependability of their opposite numbers in the partner firm.

As regards the relationship between organizational routines and the speed of new service development, the present study found that the lack of a common stock of knowledge between individuals may increase the frequency with which organizational routine mechanisms for transferring knowledge are used between firms and within a focal firm, leading to increased development time in the development of two selected services. Moreover, the present research found that, in the development of the two selected services, the development speed is associated with the adoption of different mechanisms of organizational routine under different degrees of project newness. In particular, in the development of the MMK service, this can effectively involve similar content companies and further expand the scope of existing business modules. Previous studies argued that routine can be seen as a repository of knowledge for the firm, which represents useful solutions to different tasks and stores them in different ways, such as documents, databases and artifacts (Nelson and Winter, 1982; Teece and Pisano, 1994; Zollo and Winter, 2002). When a project is relatively new, case companies used many project meetings and spent much time with a first entrant in order to collect richer

information and to identify clear project requirements. Case companies were able to save time on discussing the service requirements with a second company to expand the scope of an existing business module for the kiosk because useful solutions had been noted and stored in documentation (e.g. specification for system connection and client-interface design).

9.3 Managerial implications

The present research mainly focused on the issue of how firms adopt different types of inter-firm relationship and different organizational routines for knowledge transfer and further investigated how this issue is associated with the development speed in different types of new service development. The empirical results offer some managerial insights when firms cooperate with different suppliers to develop different types of new service.

First, the degree of task complexity and project newness influences the nature of inter-firm relationship with different suppliers. Firms should closely cooperate with their fundamental suppliers (e.g. logistics and IT system suppliers) in the early stages to lay the foundations for a new service. This is because these functional developments may involve higher degrees of task complexity, which requires a great deal of information transfer and integration with different actors or functions. Firms should use a more intense inter-firm collaboration with these suppliers to develop these fundamental functions in order to process and integrate a great deal of information from different knowledge domains and to engage in repeated examination of the results, because any failure of these functional developments may increase development cost and delay the schedule of the new service development, perhaps leading to a longer development time. Moreover, firms should use different governance modes (e.g. mutual dependence and trust) with these suppliers to reduce the possibility of opportunism by these suppliers and to increase the predictability of suppliers' behaviour, leading to a reduction of the development time required. As regards the cooperation between firms and non-fundamental suppliers, firms should cooperate less intensively with these suppliers because the development activities of these suppliers can be simply identified and separated from the development activities of focal firms. Moreover, firms should intensively cooperate with the first entrant of these suppliers to develop a new business module and modulize the development activities of a new project, because the project is

relatively new. After a new business module is established, firms can cooperate less intensively with other companies who can provide similar resources and capabilities to quickly expand the scope of service contents and save time and cost in non-fundamental development activities. Thus, the focal firm can modulize the development activities of non-fundamental suppliers and keep many options, to improve external sourcing.

Second, the degree of project newness influences the adoption of organizational routines for knowledge transfer between firms and their non-fundamental suppliers. Firms should use a higher degree of information richness mechanisms (e.g. project meeting or peer-to-peer discussion) with the first entrant, to integrate different requirements from different companies and to identify potential problems when development tasks are relatively new, although it will probably lead to an increase of the development time required for new service development. After a new business module is developed and the solution has been codified and stored in some way, such as specifications and contract terms, firms should use mechanisms with a lower degree of information richness (e.g. unified specifications and contract terms) with other companies who can provide similar resources and capabilities to join the existing business modules. It may reduce the time and cost of organizing arrangements with these suppliers and prevent valuable knowledge from being leaked.

Finally, the existence of a commonality of specialized knowledge between different functional individuals is an important influence on the frequency of using mechanisms for knowledge transfer and further affects the development speed in the development of new services. A firm can provide marketing staff with more training courses to help establish cross-functional knowledge and capability. It can prevent the waste of time and cost in discussing project requirements with partner firms and further can clearly identify and transfer the functional requirements and tasks with different functional staff, in particular IT staff, within the firm.

9.4 Research limitations and suggestions for future research

The empirical findings of the present study are useful in understanding how to establish and maintain appropriate inter-firm relationships with different actors when developing different types of new service. It suggests that focal firms should pay more attention to

the issues of project newness and project complexity, because these may influence the connection between different elements of the inter-firm relationship and the speed of new service development. This research also provides some insights into the way in which firms use organizational routines for knowledge transfer in the process of new service development. The functional knowledge sharing between individuals and project newness may influence the relationship between organizational routines and the speed with which the new service develops. However, this research has some limitations.

The most important limitation of this research is its generalizability and the strength of its conclusions. This is because it studied only two selected services in the retailing industry in Taiwan. These two selected service developments involved different degrees of task complexity and of project newness. In order to improve its generalizability, this research should be replicated in different service sectors and in other countries. This is because the different nature and context of other inter-firm relationships may be associated with the different characteristics of new service projects (e.g. different degrees of task complexity and project newness) in different service sectors when firms coopererate with different actors to develop new services. It can investigate the behaviour of focal companies and of the particular nature and context of sources of innovation under the different characteristics of new service projects and identify different business models for value creation in different service sectors. Moreover, the connection between the different nature of inter-firm relationships and development outcomes would be more widely investigated across the different characteristics of new service projects (e.g. different degrees of task complexity and project newness) in different service sectors.

Second, this research focused on the way in which convenience store chains use existing routines (focusing mainly on formal meetings) to transfer knowledge between individuals within their firms and between firms in the development of new services. This research briefly presents the work done by different formal routines and the participants involved in different formal meetings in the process of new service development. The understanding of authentential issues was also limited by time. This was because it was difficult to access project documentations (e.g. standard development procedural interactions between individuals in developing a new service is limited in terms of confidentiality: the minutes of formal meetings, documentation

regarding specifications, service procedures and checklists, operating manuals and internal announcements are all unavailable) and it is difficult adopt the method of observation in person in the field for any extended time to investigate authentic interactions between individuals engaged in developing a new service. This issue would be better studied through a longitudinal research design which allows the regular observation of authentic interactions between individuals engaged in developing a new service over an extended period of time.

Third, according to the theoretical framework in Figure 3.3, the present research focused on the issue of the adoption of different types of inter-firm relationships and different levels of organizational routines and how these are associated with development speed in two types of service development. However, there is only limited interaction between the adoption of inter-firm relationships and of different levels of organizational routines in the process of new service development. Future research might give more attention to the interaction between the adoption of inter-firm relationships and of different organizational routines when firms cooperate with different actors to develop different types of new service. This could help firms to avoid the leakage of sensitive knowledge and to facilitate knowledge transfer with different actors and further make knowledge flow into appropriate departments and staff within firms for value creation.

REFERENCES

AKGUN, A. E., KESKIN, H., BYME, J. and IMAMGLU,S. Z. (2007) Antecedents and consequences of team potency in software development projects. *Information & Management*, 44, 646-656.

ANCONA, D. G. and CALDWELL, D. F. (1987) Management issues facing new-product teams in high technology companies. IN LEWIN, D., LIPSKY, D. and SOKEL, D. (Eds.) *Advances in industrial and labor relations*. Greenwich, JAI Press.

ASHFORTH, B. E. and FRIED, Y. (1988) The mindlessness of organisational behaviors. *Human Relations*, 41, 305-329.

AULAKH, P. A., KOTABE, M. and SAHAY, A. (1996) Trust and performance in cross-border marketing partnerships: A behavioral approach. *Journal of International Business Studies*, 27, 1005-1032.

AUSSTER, E. (1992) The relationship of industry evolution to patterns of technological linkages, joint ventures, and direct investment between U.S. and Japan. *Management Science*, 17, 1-25.

BARNEY, J. B. (1991) Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.

BARTLETT, C., GHOSHAL, S. B. and BEAMISH, P. (2008) *Transnational Management: Text, Cases and Readings in Cross-Border Management*, Irwin, McGraw Hill.

BAUMOL, W. J. (2002) *The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism*, Princeton, NJ, Princeton University Press.

BECKER, M. C. (2004) Organizational routines: a review of the literature. *Industrial and Corporate Change*, 13, 643-678.

BECKER, M. C. (2005) A framework for applying organizational routines in empirical research: Linking antecedents, characteristics, and performance outcomes of recurrent interaction patterns. *Industrial and Corporate Change*, 14, 817-846.

BERNARDT, Y. (2000) *De innovativiteit van de Nederlandse dienstensector*, EIM, Zoetermeer.

BIRKINSHAW, J. (2007) Open Innovation and in-sourcing of external technologies, *keynote speech in EURAM conference*, Paris, France, May16-19.

BONACCORSI, A. and LIPPARINI, A. (1994) Strategic partnerships in new product development: An Italian case study. *Journal of Product Innovation Management*, 11, 134-145.

BRYMAN, A. and BELL, E. (2007) *Business Research Methods*, London, Oxford University Press.

BRYMAN, A. (2008) *Social Research Methods*, London, Oxford University Press.

BSTIELER, L. (2006) Trust formation in collaborative new product development. *Journal of Product Innovation Management*, 23, 56-72.

BURT, R.(1992) *Structural Holes*, Cambridge, Harvard University Press.

CAPALDO, A. (2008) The governance of design alliances in 'embedded' settings:

Evidence from the Italian design-intensive furnishings industry. *International DMI education conference*, Paris, France, April 14-15.

CARR, A. S. and PEARSON, J. N. (1999) Strategically managed buyer–seller relationships and performance outcomes. *Journal of Operations Management*, 17, 497-519.

CARR, A. S., KAYNAK, H., HARTLEY, J. L. and ROSS, A. (2008) Supplier dependence: impact on supplier's participation and performance. *International Journal of Operations & Production Management*, 28, 899-916.

CHESBROUGH, H. (2003) *Open Innovation: The new imperative for creating and profiting from technology*, Boston, Harvard Business School Press.

CHESBROUGH, H. (2006) Open Innovation: A New Paradigm for Understanding Industrial Innovation. IN CHESBROUGH, H., VANHAVERBEKE, W. and WEST, J. (Eds.) *Open Innovation: Researching a New Paradigm*. Oxford, Oxford University Press.

CHILD, J., FAULKNER, D. and TALLMAN, S. (2005) *Cooperative Strategy-Managing Alliance, Networks, and Joint Ventures*, New York, Oxford University Press.

CHILES, T.H. and McMACKIN, J.F. (1996) Integrating variable risk preferences, trust, and transaction cost economics. *Academy of Management Review*, 16, 73-99.

CLARK, K. B. and FUJIMOTO, T. (1991) *Product Development Performance: Strategy, Organization, and Management in the World Auto Industry*, Boston, Massachusetts, Harvard Business School Press.

COAWN, R., DAVID, P. and FORAY, D. (2000) The explicit economics of knowledge codification and tacitness. *Industrial and Corporate Change*, 9, 211-253.

COHEN, M. D. (1991) Individual learning and organisational routine: emerging connections. *Organisation Science*, 2, 135-139.

COHEN, M. and BACDAYAN, P. (1994) Organizational routines are stored as procedural memory: evidence from a laboratory study. *Organizational Science*, 5, 554-568.

COHEN, M. D., BURKHART, R., DOSI, G., EGIDI, M., MARENGO, L.,
ARGLIEN, M. and WINTER, S. (1996) Routines and other recurring action patterns of organisations: contemporary research issues. *Industrial and Corporate Change*, 5, 653-698.

COHEN, M. A., ELIASHBERG, J. and HO, T. H. (2000) An analysis of several new product performance metrics. *Manufacturing & Service Operations Management*, 2, 337-349.

COUSINS, P. D. and LAWSON, B. (2007) The effect of socialization mechanisms and performance measurement on supplier integration in new product development. *British Journal of Management*, 18, 311-326.

CURRALL, S. C. and JUDGE, T. A. (1995) Measuring trust between organizational boundary role persons. *Organizational Behavior and Human Decision Processes*, 64, 151-170.

DAFT, R. L., LENGEL, R. H. and TREVINO, L. K. (1987) Message equivocality, media selection, and manager performance: implications for information

systems. *MIS Quarterly*, 11, 355-366.

DAHLANDER, L. and GANN, D. (2007) How Open is Innovation? *DRUID Summer Conference*, Copenhagen, Denmark, June 18-20.

DAS, T. and TENG, B. -S. (2000) A resource-based theory of strategic alliances. *Journal of Management*, 26, 31-61.

DAVID, P. A. (1997) Path dependence and the quest for historical economics: one more chorus of the ballad of QWERTY. *Discussion Paper in Economic and Social History, Number 20*, University of Oxford. http://www.nuff.ox.ac.uk/economics/history/paper20/david3.pdf accessed on 23 April 2008.

DAYAN, M., BENEDETTO, C. D. and COLAK, M. (2009) Managerial trust in new product development projects: its antecedents and consequences. *R&D management*, 39, 21-37.

DE BRENTANI, U. (1989) Success and failure in new industrial services. *Journal of product innovation management*, 6, 239-58.

DE BRENTANI, U. (2001) Innovative versus incremental new business services: different keys for achieving success. *Journal of Product Innovation Management*, 18, 169-187.

DE JONG, J. P., BRUINS, A., DOLFSMA, W. and MEIJAARD, J. (2003) *Innovation in Service Firms Explored: What How and Why?* EIM-Business & Policy Research, Zoetermeer, The Netherlands. http://www.ondernemerschap.nl/pdf-ez/B200205.pdf accessed on 21April 2008.

DEN HERTOG, P. and BILDERBEEK, R. (1999) Conceptualising service innovation and service innovation patterns. *Research Programme on Innovation in Services (SIID) for the Ministry of Economic Affairs*, Dialogic, Utrecht.

DEKKER, H. C. (2004) Control of inter-organizational relationships: evidence on appropriation concerns and coordination requirements. *Accounting, Organizations and Society,* 29, 27-49.

DEPARTMENT OF COMMERCE (1994) *Technical manual of convenience store operation and management* (pien li shang tien ching ying kuan li chi shu shih w shou tse), Department of Commerce in Ministry of Economic Affairs, R.O.C., Taipei, Taiwan.

DITTRICH, K. (2004) *Innovation Networks: Exploration and Exploitation in the ICT Industry*. Delft, Delft University of Technology.

DITTRICH, K. and DUYSTERS, G. (2007) Networking as a Means to Strategy Change: The Case of Open Innovation in Mobile Telephony. *The Journal of Product Innovation Management*, 24, 510-521.

DOSI, G. (1997) Opportunities, incentives and the collective patterns of technological change. *Economic Journal*, 107, 1530-1547.

DOSI, G. and EGIDI, M. (1991) Substantive and procedural uncertainty-An exploration of economic behaviours in changing environments. *Journal of Evolutionary Economics*, 1, 145-168.

DOSI, G., NELSON, R. and WINTER, S. (2000) Introduction: the nature and dynamics of organizational capabilities. IN DOSI, G., NELSON, R. and WINTER, S.

(Eds.) *The Nature and Dynamics of Organizational Capabilities*. Oxford, Oxford University Press.

DONEY, P. M. and CANNON, J. P. (1997) An examination of the nature of trust in buyer-seller relationships. *Journal of Marketing*, 61, 1-13.

DONEY, P. M., CANNON, J. P., and MULLEN, M. R. (1998) Understanding the influence of national culture on the development of trust. *Academy of Management Review*, 23, 601-621.

DUBINI, P. and ALDRICH, H. (1991) Personal and extended networks are central to the entrepreneurial process. *Journal of Business Venturing*, 6, 305-313.

DYER, J. H. (1996) Does governance matter? Keiretsu alliance and asset specificity as source of Japanese competitive advantage. *Organization Science*, 7, 649-666.

DYER, J. H. (1997) Effective interfirm collaboration: How firms minimize transaction costs and maximize transaction value. *Strategic Management Journal*, 18, 535-556.

DYER, J. H. and CHU, W. (2000) The determinants of trust in supplier-automaker relationships in the US, Japan, and Korea. *Journal of International Business Studies*, 31, 259-285.

DYER, J. H. and HATCH, N.W. (2006) Relation-specific capabilities and barriers to knowledge transfer: creating advantage through network relationships. *Strategic Management Journal*, 27, 701-719.

DYER, J. H. and NOBEOKA, K. (2000) Creating and managing a high-performance knowledge-sharing network: the Toyota case. *Strategic Management Journal*, 21, 345-367.

DYER, J. H. and SINGH, H. (1998) The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*, 23, 660-679.

EGIDI, M. (1996) Routines, hierarchies of problems, procedural behaviour: some evidence from experiments. IN ARROW, K., COLOMBATTO, E., PERLMAN, M. and SCHMIDT, C. (Eds.) *The Rational Foundations of Economic Behaviour*. London, Macmillan.

EISENHARDT, K. M., TABRIZI, B.N. (1995) Accelerating adaptive processes: product innovation in the global computer industry. *Administrative Science Quarterly*, 40, 84-110.

EMMANUELIDES, P. A. (1993) Towards an integrative framework of performance in product development projects. *Journal of Engineering and Technology Management*, 10, 363-392.

FASNACHT, D. (2009) *Open innovation in the financial services: Growing through openness, flexibility and customer integration*, Berlin, Springer-Verlag.

FAULKNER, D. (1995) *International strategic alliances: Co-operating to compete*, London, McGraw-Hill International.

FELDMAN, M. S. (2000) Organizational routines as a source of continuous change. *Organization Science*, 11, 611-629.

FELDMAN, M. S. and RAFAELI, A. (2002) Organizational routines as sources of

connections and understandings. *Journal of Management Studies*, 39.309-331.

FELDMAN, M. S. and PENTLAND, B. T. (2003) Reconceptualizing organizational routines as a source of flexibility and change. *Administrative Science Quarterly*, 48, 94-118.

FETTERHOFF, T. J. and VOELKEL, D. (2006) Managing Open Innovation in Biotechnology. *Research Technology Management*, 49, 14-18.

FILIOU, D. (2007) Processes for cooperation: Insights on absorptive capacity, combinative capabilities and inter-organizational routines from a case study on a large firm in pharmaceuticals, *DRUID Summer Conference paper,* Copenhagen, Denmark, June 18-20.

FISHER, R. and URY, W. (1991) *Getting to Yes*, New York, Penguin Books.

FITZGERALD, L., JOHNSTON, R., BRIGNALL, T. J., SILVESTRO, R. and VOSS, C. (1991) *Performance Measurement in Service Businesses*, CIMA Research Series, London, Chartered Institute of Management Accountants.

FLIESS, S. and BECKER, U. (2006) Supplier integration-Controlling of co-development processes. *Industrial marketing management*, 35, 28-44.

Forfás (2006*) Services Innovation in Ireland- Options for innovation policy*, *Forfás report*, Dublin, Ireland. http://www.forfas.ie/media/forfas060928_services_innovation_full_report.pdf accessed on 30 September 2008.

FREDBERG, T., ELMQUIST, M. and OLLILA, S. (2008) Managing open innovation-present findings and future directions. *VINNOVA Report*. VINNOVA - Verket för Innovationssystem/Swedish Governmental Agency for Innovation Systems, Stockholm, Sweden. http://www.openinnovation.eu/download/vr-08-02.pdf accessed on 17 October 2008.

GALLOUJ, F. and WEINSTEIN, O. (1997) Innovation in services. *Research Policy*, 26, 537-556.

GANESAN, S. (1994) Determinants of long-term orientation in buyer-seller relationships. *Journal of Marketing*, 58, 1-19.

GAO, T., SIRGY, M. J. and BIRD, M. M. (2005) Reducing buyer decision-making uncertainty in organizational purchasing: Can supplier trust, commitment, and dependence Help? *Journal of Business Research*, 58, 397-405.

GASSMANN, O. and ENKEL, E. (2004) Toward a theory of open innovation: Three core process of archetypes. *The R&D Management Conference*, Lisbon, Portugal, July 6-9.

GASSMANN, O., ENKEL, E. and CHESBROUGH, H. (2010) The future of open innovation. *R &D Management*, 40, 213-221.

GERPOTT, T. J. (1999) *Strategisches technologie-und innovationsmanagement [Strategic technology and innovation management]*. Scha¨ffer-poeschel, Stuttgart.

GERSICK, C. J. and HACKMAN, J. R. (1990) Habitual routines in task-performing groups. *Organizational Behavior and Human Decision Processes*, 47, 65-97.

GIBBS, G (2008) *Analyzing qualitative data*, London, Sage Publication.

GITTELL, J. H. (2002) Coordinating mechanisms in care provider groups: relational coordination as a mediator and input uncertainty as moderator of performance effects. *Management Science*, 48, 1408-1426.

GOROVAIA, N. and WINDSPERGER, J. (2010) The use of knowledge transfer mechanisms in franchising. *Knowledge and Process Management*, 17, 12-21.

GRANT, R. M (1991) The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review*, 33, 114-135.

GRANT, R. M (1996) Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17, Winter Special Issue, 109-122.

GRANOVETTER, M. (1973) The strength of weak ties. *American Journal of Sociology*, 78, 1360-1380.

GRANOVETTER, M. (1985) Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91, 481-510.

GRIFFIN, A. and PAGE, A. L. (1996) PDMA success measurement project. *Journal of Product Innovation Management*, 13, 478-496.

GRIFFIN, A. (1997) Modeling and measuring product development cycle time across industries. *Journal of Engineering and Technology Management*, 14, 1-24.

GULATI, R. (1995) Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *The Academy of Management Journal*, 38, 85-112.

GULATI, R. (1998) Alliances and networks. *Strategic Management Journal*, 19, 293-317.

GULATI, R., NOHRIA, N. and ZAHEER, A. (2000) Strategic networks. *Strategic Management Journal*, 21, 203-215.

HAGEDOORN, J. and NARULA, R. (1996) Choosing organizational modes of strategic technology partnering: international sectoral differences. *Journal of International Business Studies*, 27, 265-284.

HAGEN, J. M., and CHOE, S. (1998) Trust in Japanese interfirm relations: Institutional sanctions matter. *Academy of Management Review*, 23, 589-600.

HAILE´N, L., JOHANSON, J. and SEYED-MOHAMED, N. (1991) Interfirm adaptation in business relationships. *Journal of Marketing*, 55, 29-38.

HAKANSSON, H. and WALUSZEWSKI, A. (2003) *Managing Technological Development*. London, Routledge.

HALE, M. and TIDD, J. (2009) The practice of routines and representations in design and development. *Industrial and Corporate Change*, 18, 551-574.

HANDFIELD, R., RAGATZ, G., PETERSEN, K. and MONCZKA, R. (1999) Involving suppliers in new product development. *California Management Review*, 42, 59-82.

HANNAN, M. T. and FREEMAN, J. R. (1983) Structural inertia and organizational change. *American Sociological Review*, 29, 149-164.

HARRIGAN, K. R. (1984) Formulating vertical integration strategies. *Academy of Management Review*, 9, 638-652.

HILL, R. C. and HELLRIEGEL, D. (1994) Critical contingencies in joint venture

management: Some lessons from managers. *Organization Science*, 5, 594-607.

HIPP, C., TETHER, B. and MILES, I. (2000) The incidence and effect of innovation in services: evidence from Germany. *International Journal of Innovation Management*, 4, 417-453.

HIPP, C. and HARIOLF, G. (2005) Innovation in the service sector: The demand for service-specific innovation measurement concepts and typologies. *Research Policy*, 34, 517-535.

HIRUNYAWIPADA, T., BEYERLEIN, M. and BLANKSON, C. (2010) Cross-functional integration as a knowledge transformation mechanism: Implications for new product development. *Industrial Marketing Management*, 39, 650-660.

HODGSON, G. M. (1988) *Economics and Institutions*, Oxford, Polity Press.

HODGSON, G. M. (1998) The approach of institutional economics. *Journal of Economic Literature*, 36, 166-192.

HODGSON, G. M. (2001) *How Economics Forgot History: The Problem of Historical Specificity in Social Science*, London, Routledge.

HODGSON, G. M. (2003) The mystery of the routine: the Darwinian destiny of An Evolutionary Theory of Economic Change, *Revue économique*, 54, 355-384.

HODGSON, G. M. and KNUDSEN, T. (2003) The replication of habits, *mimeo*, University of Hertfordshire.

HODGSON, G. M. and KNUDSEN, T. (2004) The firm as an interactor: firms as vehicles for habits and routines, *Journal of Evolutionary Economics*, 14, 281-307.

HOFSTEDE, G. (1984) Culture's consequences: international difference in work related values, Beverly Hills, CA, Sage Publication.

HOWELLS, J. and TETHER, B. (2004) Innovation in services: Issues at stake and trends. *A report for DG Enterprise of the European Commission*, under contract INNO-Studies 2001: Lot 3 (ENTR-C/2001), Brussels, European Commission.

HOWORTH, C., WESTHEAD, P. and WRIGHT, M. (2004) Buyouts, information asymmetry and the family management dyad. *Journal of Business Venturing*, 19, 509-534.

INKPEN, A. and CROSSAN, M. (1995) Believing is seeing: joint ventures and organisation learning. *Journal of Management Studies*, Vol. 32, pp. 595-619.

JACK, S. L. (2005) The role, use and activation of strong and weak network ties: A qualitative analysis. *Journal of Management Studies*, 42, 1233-1259.

JONSSON, A. and ELG, U. (2006) Knowledge and knowledge sharing in retail internationalization: IKEAs entry into Russia. *The International Review of Retail, Distribution and Consumer research special issue*, 16, 239-256.

JOHNE, A. and STOREY, C. (1998) New service development: A review of the literature and annotated bibliography. *European Journal of Marketing*, 32, 184-252.

KALLING, T. (2003) Organization-internal transfer of knowledge and the role of motivation: a qualitative case study. *Knowledge and Process Management*, 10, 115-126.

KALE, S. H. (1991) Culture-specific marketing communications: An analytical approach. *International Marketing review*, 8, 18-30.

KANERVA, M., HOLLANDERS, H. and ARUNDEL, A. (2006) Can we measure and compare innovation in services? *TrendChart report,* European Trend Chart on Innovation.
www.proinno-europe.eu/node/doc/eis_2006_innovation_in_services.pdf accessed on 21 May 2008.

KANTER, R.M. (1994) Collaborative advantage: the art of alliances. *Harvard Business Review*, 72, 96-108.

KAPLAN, R. S. and NORTON, D. P. (1992) The Balanced Seorecard: Measures that Drive Performance. *Harvard Business Review*, 70, 71-90.

KESSLER, E. H. and CHAKRABARTI, A. K. (1996) Innovation speed: a conceptual model of context, antecedents, and outcomes. *Academy of Management Review*, 21, 1143-1191.

KIM, K. K., PARK, S. H., RYOO, S. Y. and PARK, S. K. (2010) Inter-organizational cooperation in buyer–supplier relationships: Both perspectives. *Journal of Business Research*, 63, 863-869.

KRAUSE, D. R. and ELLRAM, L. M. (1997) Critical elements of supplier development. *European Journal of Purchasing and Supply Management*, 3, 21-31.

KRISTENSEN, F. (1999) Towards a taxonomy and theory of the interdependence between learning regimes and sectoral patterns of innovation and competition: an empirical analysis of an elaborated Pavitt taxonomy applying Danish data. *DRUID Winter Conference paper,* Copenhagen, Demark, January 7-9.

LAAKSONEN, T., PAJUNEN, K. and KULMALA, H. I. (2008) Co-Evolution of Trust and Dependence in Customer-Supplier Relationships. *Industrial Marketing Management*, 37, 910-920.

LIAO, S.-S. (1978) The research on Taiwanese supermarket and convenience store. *Master dissertation*, National Cheng Kung University, Tainan, Taiwan.

LANGLOIS, R. N. and ROBERTSON, P. L. (1995) *Firms, Markets and Economic Change*, London, Routledge.

LARSON, A. (1992) Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative Science Quarterly*, 37, 76-104.

LAZARIC, N. and MARENGO, L. (2000) Towards a characterization of assets and knowledge created in technological agreements: Some evidence from the automobile robotics sector. *Industrial and Corporate Change*, 9, 53-86.

LAZZAROTTI, V. and MANZINI, R. (2009) Different modes of open innovation: A theoretical framework and an empirical study. *International journal of innovation management*, 13, 615-636.

LERTPITTAYAPOOM, N. (2005) *An exploratory study on interorganizational knowledge sharing in an information system implementation environment*, PhD thesis, Carbondale, Southern Illinois University.

LEWICKI, R, J, and BUNKER, B. B. (1995) Trust in relationships: A model of development and decline. IN BUNKER, B, B, and RUBIN, J. Z. (Eds.) *Conflict,*

cooperation, and justice: Essays Inspired by the Work of Morton Deutsch. San Francisco, Jossey-Bas Publishers.

LICHTENTHALER, U (2008) Open innovation in practice: An analysis of strategic approaches to technology transactions, *IEEE Transactions of Engineering Management,* 55, 148–157.

LITTLER, D., LEVERICK, F. and BRUCE, M. (1995) Factors affecting the process of collaborative product development: A study of UK manufacturers of information and communications technology products. *Journal of Product Innovation Management,* 12, 16-32.

LITTLER, D., LEVERICK, F. and WILSON, D. (1998) Collaboration in new technology based markets. *International Journal of Technology Management,* 15, 139-159.

LOVELOCK, C. H. (1984) Developing and implementing new services. IN GEORGE, W. R. and MARSHALL, C. E. (Eds.) *Developing New Services*. Chicago, American Marketing Association.

LUNDVALL, B. A. and JOHNSON, B. (1994) The learning economy. *Journal of industry studies*, 1, 23-42.

LUO, Y. (2002) Contract, cooperation, and performance in international joint ventures. *Strategic Management Journal*, 23, 903-919.

LUSCH, R. F. and BROWN, J. R. (1996) Interdependency, contracting, and relational behavior in marketing channels. *Journal of Marketing*, 60, 19-38.

MADHOK, A. (1996) The organization of economic activity: Transaction costs, firm capabilities, and the nature of governance. *Organization Science*, 7, 577-590.

MAFFEI, S., MAGER, B. and SANGIORGI, D. (2005) Innovation through service design: from research and theory to a network of practice, a users' driven perspective. *Joining Forces: International Conference on Design Research*, Helsinki, Finland, September 22-24.

MALERBA, F. (2004) Sectoral systems of innovation: basic concept. IN MALERBA, F. (Eds.) *Sectoral systems of innovation*, Cambridge, Cambridge University Press.

MALERBA F. and ORSENIGO L. (1997) Technological regimes and sectoral patterns of innovative activities. *Industrial and corporate change*, 6, 83-117.

MANTE, A. and SYDOW, J. (2007) Inter-organizational Routines: Coordinating R&D Practices in International Alliances, *International Conference on Organizational Routines: Empirical Research and Conceptual Foundations*, Strasbourg, France, May 25-26.

MASSEY, G. R. and ELIAS, K. (2007) Interpersonal trust between marketing and R&D during new product development projects. *European Journal of Marketing*, 41, 1146-1172.

MAYER, R. C., DAVIS, J. H., SCHOORMAN, F. D. (1995) An integrative model of organizational trust. *Academy of Management Review*, 20, 709-734.

McALLISTER, D. J. (1995) Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal*, 38, 24-59.

MENOR, L. J., TATIKONDA, M.V. and SAMPSON, S. E. (2002) New service

development: Areas for exploitation and exploration. *Journal of Operations Management,* 20, 135-157.

MEYER, M. H. and UTTERBACK, J. M. (1995) Product development cycle time and commercial success. *IEEE Transactions on Engineering Management,* 42, 297-304.

MILES, I. (1994) Innovation in services. IN DODGSON, M. and ROTHWELL, R. (Eds.) *The Handbook of Industrial Innovation.* Brookfield, Aldershot, Edward Elgar.

MILES, I. (2008) Patterns of innovation in service industries. *IBM systems journal,* 47,115-128.

MOENAERT, R. K., DE MEYER, A., SOUDER, W. E., Deschoolmeester, D. (1995) R&D /Marketing communication during the fuzzy front-end. *IEEE Transactions on Engineering Management,* 42, 243-258.

MONGE, P. R. and CONTRACTOR, N . S. (2000) Emergence of communication networks. IN JABLIN, F. M. and PUTNAM, L. L. (Eds.) The New *Handbook of Organizational Communication: Advances in Theory, Research, and Methods.* Thousand Oaks, Sage Publications.

MORGAN, R. M. and HUNT, S. D. (1994) The commitment–trust theory of relationship marketing. *Journal of Marketing*, 58, 20-38.

NELSON, R. R. and WINTER, S. G. (1982) *An Evolutionary Theory of Economic Change*. : Cambridge, Harvard University Press.

NELSON, R. (1995) Recent evolutionary theorizing about economic change. *Journal of economic literature*, 33, 48-90.

NELSON, R. R. and WINTER, S. G. (2002) Evolutionary theorizing in economics, *Journal of economic perspectives*, 16, 23-46.

NIJSSEN, E. J., HILLEBRAND, B., VERMEULEN, P. A. M. and KEMP, R. G. M. (2006) Exploring product and service innovation similarities and differences. *International jornal of research in marketing,* 23, 241-251.

NISHIGUCHI, T. (1994) *Strategic Industrial Sourcing,* New York, Oxford University Press.

NONAKA, I. (1991) The knowledge-creating company. *Harvard Business Review*, 6, 96-104.

NOOTEBOOM, B. (1999) Innovation and inter-firm linkages: new implications for policy. *Research Policy*, 28, 793-805.

NOOTEBOOM, B. (2004) Learning and governance in inter-firm relations. *Revue d'Economie Politique*, 114, 55-76.

NYLÉN, U. (2007) Interagency collaboration in human service: impact of formalization and intensity on effectiveness. *Public Administration*, 85, 143-166.

OLK, P. (1997) The effect of partner differences on the performance of R&D consortia. IN BEAMISH, P. W. and KILLING, J. P. (Eds.) *Cooperative strategies: North American perspectives,* San Francisco, New Lexington Press.

PARKHE, A. (1993) Strategic alliance structuring: A game theoretic and transaction cost examination of interfirm cooperation. *Academy of Management Journal,* 36, 794-829.

PAULRAJ, A., LADO, A. A. and CHEN, I. J. (2008) Inter-organizational communication as a relational competency: antecedents and performance outcomes in collaborative buyer-supplier relationships. *Journal of Operations Management*, 26, 45-64.

PAVITT, K. (1984) Sectoral patterns of technical change: Towards a taxonomy and a theory. *Research Policy*, 13, 343-373.

PENTLAND, B. T. and REUTER, H. (1994) Organisational routines as grammars of action. *Administrative Sciences Quarterly*, 39, 484-510.

PENTLAND, B. T. (2004) Towards an ecology of inter-organizational routines: A conceptual framework for the analysis of net-enabled organizations. *Hawaii International Conference on Systems Sciences*, Hawaii, USA, January 5-8.

PENTLAND, B. T. and FELDMAN, M. S. (2005) Organizational routines as a unit of analysis. *Industrial and Corporate Change*, 14, 793-815.

PETERSEN, K., HANDFIELD, R. and RAGATZ, G. L. (2003) A Model of supplier integration into new product development. *Journal of Product Innovation Management*, 20, 284-299.

PETERSEN, K., HANDFIELD, R. and RAGATZ, G. L. (2005) Supplier integration into new product development: coordinating product, process and supply chain design, *Journal of Operation Management*, 23, 371- 388.

PFEFFER, J. and SALANCIK, G. R. (1978) *The External Control of Organizations: A Resource Dependence Perspective*, New York, Harper and Row.

POPPO, L. and ZENGER, T. (2002) Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal*, 23, 707-725.

POSTREL, S. and RUMELT, R. (1992) Incentives routines and self command. *Industrial and Corporate Change*, 1, 397-425.

POWELL, W. W. (1990) Neither market nor hierarchy: Network forms of organization. *Research in organizational behavior*, 12, 295-336.

POWELL, W. W., KOPUT, K. W. and SMITH-DOERR, L. (1996) Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41, 116-145.

PRESCOTT, C. (1998) Interdependence, coordination, and structure in complex organizations: Implications for organization design. *The Mid - Atlantic Journal of Business*, 34, 5-22.

RAGATZ, G. L., HANDFIELD, R. B. and PETERSEN, K. J. (2002) Benefits associated with supplier integration into new product development under conditions of technology uncertainty. *Journal of Business Research*, 55, 389-400.

REASON, J. (1990) *Human Error*. Cambridge, Cambridge University Press.

REYNAUD, B. (1998) Les propriétés des routines: outils pragmatiques de décision et modes de coordination collective. *Sociologie du travail*, 4, 465-477.

RING, P. S. and VAN DE VEN, A. H. (1994) *Developmental Processes of Cooperative Interorganizational Relationships*. *Academy of Management Review*, 19, 90-118

SAKO, M. (1991) The Role of 'Trust' in Japanese Buyer-Supplier Relationships.

Ricerche Economiche, 45, 449-474.

SAKO, M. (1992) *Prices, quality and trust: Inter-firm relations in Britain and Japan,* Cambridge, Cambridge University Press.

SAKO, M. and HELPER, S. (1998) Determinants of trust in supplier relations: Evidence from the automotive industry in Japan and the United States. *Journal of Economic Behavior and Organization*, 34, 387- 417.

SAUNDERS, M., LEWIS, P. and THORNHILL, A. (2003) *Research Methods for Business Students*, England, Pearson Education Limited.

SCARBROUGH, H. and AMAESHI, K. (2009) Knowledge governance for open innovation: evidence from an EU R&D collaboration. IN FOSS, N. J. and MICHAILOVA, S. (Eds.) *Knowledge Governance-Processes and Perspectives.* New York, Oxford University Press.

SEPPANEN, R., BLOMQVIST, K. and SUNDQVIST, S. (2007) Measuring inter-organizational trust—a critical review of the empirical research in 1990-2003. *Industrial Marketing Management*, 36, 249-265.

SHEER, V. C. and CHEN, L. (2004) Improving media richness theory: a study of interaction goals, message valence, and task complexity in manager-subordinate communication. *Management Communication Quarterly*, 11, 76-93.

SIMARD, C. and WEST, J. (2006) Knowledge networks and the geographic locus of innovation. IN CHESBROUGH, H., VANHAVERBEKE, W. and WEST, J. (Eds.) *Open Innovation: Researching a New Paradigm.* Oxford, Oxford University Press.

SMITH, K. G., CARROLL, S. J. and ASHFORD, S.J. (1995) Intra- and inter-organizational cooperation: toward a research agenda. *Academy of Management Journal*, 38, 7-23

SMITH, J. B. and BARCLAY, D. W. (1997) The effects of organizational differences and trust on the effectiveness of selling partner relationships. *Journal of Marketing*, 61, 3-21.

SOETE, L. and MIOZZO, M. (1989) Trade and development in services: A technological perspective. *MERIT Research Memorandum*, MERIT, The Netherlands.

STOREY, C. and KELLY, D. (2001) Measuring the performance of new service development activities. *The Service Industries Journal*, 21, 71-90.

TAIWAN INSTITUTE OF ECONOMIC RESEARCH (2002) *Research on retail industry* (liu tung chan yeh yen chiu). Department of Commerce, Ministry of Economic Affairs, R.O.C., Taipei, Taiwan

TAKEISHI, A. (2001) Bridging inter-and intra-firm boundaries: management of supplier involvement in automobile product development. *Strategic Management Journal*, 22, 403-433.

TATIKONDA, M.V. and MONTOYA-WEISS, M. M. (2001) Integrating operations and marketing perspectives of product innovation: the influence of organizational process factors and capabilities on development performance. *Management Science*, 47, 151-172.

TANI, T. and VON WANGENHEIM, S. (1998) Vergleichende empirische Analyse des

Serienanlaufs bei Automobilzulieferern in Deutschland und Japan. IN HORVATH, P. and FLEIG, G. (Eds.) *Integrationsmanagement für neue Produkte.* Stuttgart, Schäffer-Poeschel Verlag.

TEECE, D. and PISANO, G. (1994) The dynamic capabilities of firms: an introduction. *Industrial and Corporate Change*, 3, 537-556.

TEECE, D., PISANO, G. and SHUEN, A. (1997) Dynamic capabilities and strategic management. *Strategic Management Journal*, 18, 509-534.

TETHER, B. S. (2002) The sources and aims of innovation in services: variety between and within Sectors. *CRIC Discussion Paper No. 55*, University of Manchester, Manchester, U.K.

TETHER, B. S., MILES, I., BLIND, K., HIPP, C., DE LISO, N. and CAINELLI, G. (2002) Innovation in the Service Sector: Analysis of Data Collected Under the Community Innovation Survey (CIS-2), *CRIC Working Paper No. 11*, University of Manchester, Manchester, U.K.

TETHER, B. S. and Metcalfe, J. S. (2004) Services and Systems of Innovation. IN MALERBA, F. (Ed.) *Sectoral Systems of Innovation: Concepts, Issues and Analyses of Six Major Sectors in Europe*. Cambridge, Cambridge University Press.

TIDD, J., BESSANT, J. (2009) *Managing Innovation - integration technological market and organizational change*, London, John Wiley & Sons.

TROTT, P. and HARTMANN, D.(2009) Why "open innovation "is old wine in new bottles. *International journal of innovation management*, 13, 715-736.

UZZI, B. (1997) Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42, 35-67.

VANHAVERBEKE, W., CLOODT, M. and VAN DE VRANDE, V. (2007) Connecting absorptive capacity and open innovation, *Centre for Advanced Study (CAS) workshop on Innovation in firms*, Asker, Norway, October 30- November 1.

VAN DE VRANDE, V., LEMMENS, C. and VANHAVERBEKE, W. (2006) Choosing governance modes for external technology sourcing. *R&D Management*, 36, 347-363.

VERMEULEN, P.A.M. (2001) *Organizing Product Innovation in Financial Services*, Nijmegen, Nijmegen University Press.

VERMEULEN, P.A.M. and Aa, W. VAN DER. (2003) Organizing Innovation in Services. IN TIDD, J. and HULL, F. (Eds.) *Service Innovation:Organizational Responses to Technological Opportunities & Market Imperatives*, London, Imperial College Press.

VERWORN, B (2009) A structural equation model of the impact of the "fuzzy front end" on the success of new product development. *Research Policy*, 38, 1571-1581.

VON CORSWANT, F. and TUNALV, C. (2002) Coordinating customers and proactive suppliers- A case study of supplier collaboration in product development. *Journal of Engineering and Technology Management*, 19, 249-261.

VON HIPPEL, E. (1988) *The sources of innovation*. New York, Oxford University

Press.

VON ZEDTWITZ, M. and GASSMANN, O. (2002) Market versus technology driven in R&D internationalisation: Four different patterns of managing research and development. *Research Policy*, 31, 569-588.

VOSS, C., JOHNSTON, R., SILVESTRO, R., FITZGERALD, L. and BRIGNALL, T.(1992) Measurement of innovation and design performance in services. *Design Management Journal*, Winter, 40-46.

WASTI, S. and LIKER, J. (1999) Collaborating with Suppliers in Product Development: A U.S. and Japan Comparative Study. *IEEE Transactions on Engineering Management*, 46, 245-257.

WEICK, K. E. and ROBERTS, K. H. (1993) Collective minds in organizations: heedful interrelating on flight decks. *Administrative Science Quarterly*, 38, 357-81.

WEST, J. and GALLAGHER, S. (2006) Challenges of open innovation: the paradox of firm investment in open-source software. *R&D Management*, 36, 319-331.

WHITTEN, D. and WAKEFIELD, R. L. (2006) Measuring switching costs in IT outsourcing services. *Journal of strategic information systems*, 15, 219-248.

WILLIAMSON, O. E. (1975) *Markets and hierarchies: analysis and antitrust implications.* New York, Free Press.

WILLIAMSON, O. E. (1979) Transaction-cost economics: The governance of contractual relations. *Journal of Law and Economics*, 22, 233-261.

WILLIAMSON, O. E. (1985) *The Economic Institutions of Capitalism.* New York, Free Press.

WOOLTHUIS, R. K., HILLEBRAND, B. and NOOTEBOOM, B. (2005) Trust, Contract and Relationship Development. *Organization Studies*, 26, 813-840.

XIN, Y. K. CHAI, H. and TAN, K. C. (2006) Service Innovation: A review and future research areas. *IEEE International Conference on Management of Innovation and Technology*, Singapore, June 21-23.

YIN, R. K. (2003) Case study research: Design and methods, Thousand Oaks, CA, Sage Publication.

YOUNG-YBARRA, C. and WIERSEMA, M. F. (1999) Strategic flexibility in information technology alliances: The influence of transaction cost economics and social exchange theory. *Organization Science*, 10, 439- 459.

ZAJAC, E.J. and OLSON, C.P. (1993) From transaction cost to transaction value analysis: implications for the study of interorganizational strategies. *Journal of Management Studies*, 30, 131-145.

ZAHEER, A., McEVILY, B. and PERRONE, V. (1998) Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance. *Organization Science*, 9, 141-159.

ZAHEER, A., LOFSTROM, S. and GEORGE, V. P. (2002) Interpersonal and interorganizational trust in alliances. IN CONTRACTOR, J. and LORANGE, P. (Eds.) *Cooperative strategies and alliances*. London, Pergamon.

ZAHRA, A. S. and NIELSEN, A. P. (2002) Sources of capabilities, integration and technology commercialization. *Strategic Management Journal*, 23, 377-398.

ZOLLO, M., REUER, J. J., and SINGH, H. (2002) Interorganizational routines and

performance in strategic alliances. *Organization Science*, 13, 701-713.
ZOLLO, M. and WINTER, S. G. (2002) Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13, 339-351.

APPENDIX 1

Two sets of interview questions for pilot study-English version

Interview Question

Respective interviewee: people who work in chained convenience stores and involve in MMK service development

1. How does your company develop a new service in terms of company's internal working process？Take the MMK service as an example, which department in your company had been involved in developing the new service？ What kinds of assessment had be conducted from the step of idea generation to the step of execution？

2. Take the MMK service as an example, what kinds of knowledge source and capability were required for new service development within your company? (for instance: accumulated knowledge and experience from prior related operations; from external sources which include supplier and customer？) If the external source of knowledge came from the service supplier, which step did the supplier get involved in the process of developing MMK service **?**

3. What types of collaboration with service supplier did your company adopt in order to develop MMK service (e.g. purchase of know-how or technology, licensing, joint development or joint venture)? And what factors did your company take into account when deciding the type of collaboration?

4. Within the collaboration between your company and service supplier, was it your company or service supplier who predominate the process of developing MMK service **?** What respective tasks did your company and service supplier carry out **?**

5. How did your company communicate and transfer new service development related knowledge or information with suppliers during the process of developing MMK service (such as formal meeting and training) **?** How frequent was the communication **?**

6. How did departments within your company communicate and share new service

development related information and knowledge during the process of developing MMK service (such as formal meeting and/or house organ)？How frequent was the communication？ How did people communicate and share related information and knowledge within the project team？How did people transfer acquired knowledge from individual level to organisational level in order to accumulate organisational knowledge and capability (such as operational manual and/or training)？

Interview Question

Respective interviewee: people who work in supplier's company and involve in MMK service development

1. Have your company ever involved in the process of developing MMK service ? If Yes, which step did your company get involved the process of developing MMK service ?

2. What types of collaboration with chained convenience stores did your company adopt in order to develop MMK service, such as technology purchase, licensing, joint development and, joint venture ? And what factors did your company take into account when deciding the type of collaboration?

3. Who will be the predominant role during the process of developing MMK service when your company collaborate with chained convenience stores ? What kinds of responsibility do your company and service supplier carry out ?

4. How does your company communicate and transfer the related knowledge or information with chained convenience stores during the process of developing MMK service, such as formal meeting and training ? How communication frequency is ?

Two sets of interview questions for pilot study-Chinese version

服務名稱:MMK 服務

訪談對象:便利商店內部參與 MMK 服務開發之相關人員

訪談大綱

1. 就內部流程來說,請問貴公司如何開發一項新服務？以 MMK 服務為例，貴公司內部那些部門曾經參與這項服務的開發過程？從概念的產生到實際執行的歷程中，曾經過那些評估過程？
2. 以 MMK 服務為例，請問貴公司在新服務的開發過程中，所需知識或能力包含那些來源(例如：貴公司過去累積的相關營運知識或經驗；外部來源包含供應商、顧客等)？若包含服務供應商，則請問服務供應商於貴公司服務開發流程中的那一個階段加入此項服務的開發？
3. 請問貴公司與服務供應商是採用何種合作方式(例如：技術的購買、授權、共同開發或合資等方式)去開發 MMK 服務？在決定合作方式的過程中，貴公司通常會考量那些因素？
4. 請問在 MMK 服務開發過程中，貴公司與服務供應商何者扮演主導開發的角色？雙方執行的工作內容分別為何？
5. 請問貴公司在 MMK 服務的開發過程中，貴公司與服務供應商之間如何溝通與傳達新服務開發的相關資訊或知識(例如：正式會議、教育訓練等方式)？溝通頻率為何？組織間信任程度是否會影響雙方知識的移轉與分享？若是，請說明有何影響？
6. 請問貴公司在 MMK 服務的開發過程中，貴公司內部各部門如何溝通與傳達新服務開發的相關資訊或知識(例如：正式會議、內部刊物等方式)？溝通頻率為何？專案人員彼此是如何溝通與傳達相關的資訊或知識？專案人員如何將已獲取的知識由個人移轉至組織層級，以累積組織的知識與能力(例如：營運手冊、教育訓練等方式)？

服務名稱:MMK 服務

訪談對象:以服務供應商內部參與 MMK 服務開發之相關人員

訪談大綱

1. 請問貴公司是否加入全家便利商店 MMK 服務的開發流程？若有，那請問貴公司於全家便利商店新服務開發流程中的那一個階段加入此項服務的開發？
2. 請問貴公司與全家便利商店是採用何種合作方式(例如：技術的購買、授權、共同開發或合資等方式)去開發 MMK 服務？在決定合作方式的過程中，全家便利商店通常會考量那些因素？
3. 請問在 MMK 服務開發過程中，貴公司與全家便利商店何者扮演主導開發的角色？雙方執行的工作內容分別為何？
4. 請問貴公司在 MMK 服務的開發過程中，貴公司與全家便利商店之間如何溝通與傳達新服務開發的相關資訊或知識(例如：正式會議、教育訓練等方式)？溝通頻率為何？組織間信任程度是否會影響雙方知識的移轉與分享？若是，請說明有何影響？

APPENDIX 2

Two sets of interview questions for fieldwork- English version

Interview Question

Respective interviewee: people who work in chained convenience stores and involve in MMK service development

1. Why does your company develop MMK service? And please describe the process of MMK service development. What kinds of internal and external resources (knowledge source and capability) were involved in different stages of this service development? (For instance: from internal source which include accumulated knowledge and experience from prior related operations…etc; from external sources which include supplier and customer…etc) What kinds of innovative behaviour or change in the service development (For instance: client interface, service delivery system, and technological options…etc)? Which department in your company had been involved in developing the new service? What kinds of assessment had be conducted from the step of idea generation to the step of execution in terms of internal development process?

2. What role do your company and service suppliers play during the MMK service development process? What respective tasks did your company and service supplier carry out? Who predominate the process of developing MMK service and explain why?

3. What types of collaboration with service supplier did your company adopt in order to develop MMK service (e.g. contract development, coordinated development or joint development)? Did the speed of new service development influence by different type of cooperation with supplier? If Yes, please explain how to influence it.

4. What level of interdependence between your company and service suppliers (For instance: supplier's valuable resource/knowledge, stockholder sharing or switching cost…etc)? Did the speed of new service development influence by level of interdependence between firms? If Yes, please explain how to influence it. And did the speed of new service development influence by the level of trust between your company

and service supplier (For instance: supplier's capability, experience and goodwill…etc)? If Yes, please explain how to influence it.

5. How did your company communicate with suppliers by formal communication to enhance the related knowledge or information flow during the process of developing MMK service (such as progress review meeting, operation manual and specification document…etc)? How frequent was the communication? What kind of work is discussed in the formal communication procedure?

6. How did your staff communicate with suppliers by informal communication to enhance the related knowledge or information flow during the process of developing MMK service (such as interpersonal communication, telephone communication, and email…etc)? How frequent was the communication? What kind of work is discussed in the informal communication procedure? Does the speed of new service development influence by the quality of knowledge flow between firms? If Yes, please explain how to influence it. Which style of communication (formal communication or informal communication) is more effective to facilitate knowledge flow?

7. How did your company communicate with suppliers by formal communication to enhance the related knowledge or information flow during the process of developing MMK service (such as progress review meeting, operation manual and house organ)**?** How frequent was the communication? What kind of work is discussed in the formal communication procedure? How did your staff communicate with suppliers by informal communication to enhance the related knowledge or information flow during the process of developing MMK service (such as interpersonal communication, telephone communication, and email…etc)? How frequent was the communication? What kind of work is discussed in the informal communication procedure?

8. How did people transfer acquired knowledge from individual level to organisational level in order to accumulate organisational knowledge and capability (such as project

database and/or training)? Does the speed of new service development influence by the quality of knowledge flow within your company? If Yes, please explain how to influence it. Which style of communication (formal communication or informal communication) is more effective to facilitate knowledge flow?

Interview Question

Respective interviewee: people who work in supplier's company and involve in MMK service development

1. Which step did your company get involved the process of developing MMK service? Please explain why you get involved? What kinds of innovative behaviour or change offered by your company in the service development (For instance: client interface, service delivery system, and technological options…etc)?

2. What role do your company and the chained convenience store (CVS) play during the MMK service development process? What respective tasks did your company and CVS carry out? Who predominate the process of developing MMK service and explain why?

3. What types of collaboration with CVS did your company adopt in order to develop MMK service (e.g. contract development, coordinated development or joint development)? Did the speed of new service development influence by the type of cooperation with CVS? If Yes, please explain how to influence it.

4. What level of interdependence between your company and CVS (For instance: supplier's valuable resource/knowledge, stockholder sharing or switching cost…etc)? Did the speed of new service development influence by level of interdependence between firms? If Yes, please explain how to influence it. And did the speed of new service development influence by the level of trust between your company and CVS (For instance: supplier's capability, experience and goodwill…etc)? If Yes, please explain how to influence it.

5. How did your company communicate with CVS by formal communication to enhance the related knowledge or information flow during the process of developing MMK service (such as progress review meeting, operation manual and specification document…etc)? How frequent was the communication? What kind of work is discussed in the formal communication procedure?

6. How did your staff communicate with CVS by informal communication to enhance

the related knowledge or information flow during the process of developing MMK service (such as interpersonal communication, telephone communication, and email…etc)? How frequent was the communication? What kind of work is discussed in the informal communication procedure? Does the speed of new service development influence by the quality of knowledge flow between firms? If Yes, please explain how to influence it. Which style of communication (formal communication or informal communication) is more effective to facilitate knowledge flow?

Two sets of interview questions for fieldwork -Chinese version

服務名稱:MMK 服務

訪談對象:便利商店內部參與 MMK 服務開發之相關人員

訪談大綱

1.請問貴公司開發 MMK 服務的原因為何? 並請說明此項服務的發展過程。

2.請問此項服務開發過程的各階段，有那些內部或外部的資源(知識或能力)投入此項服務開發(例如:內部來源:貴公司過去累積的相關營運知識或經驗；外部來源:供應商、顧客等)？而此項服務的開發，具有那些創新行為或改變(例如:消費者使用介面、服務傳遞系統、技術功能等方面)?

3.請問在 MMK 服務開發過程中，貴公司與服務供應商分別扮演何種角色? 而雙方執行的工作內容分別為何？

4.請問貴公司與服務供應商採用何種的合作方式(例如：合約開發、協同開發或共同開發等方式)? 請問貴公司與服務供應商採用不同的合作方式，是否會影響新服務開發的速度? 請說明如何影響?

5.請問貴公司與服務供應商之間相互依賴程度(例如:供應商特定價值資源或知識、股權持有或轉換成本等因素)為何? 請問組織間相互依賴程度是否會影響新服務開發的速度? 請說明如何影響?

6.貴公司與服務供應商之間信任程度(例如:供應商的能力、經驗與商譽等因素)是否會影響新服務開發的速度? 請說明如何影響?

7.請問貴公司在 MMK 服務的開發過程中，貴公司與服務供應商之間如何透過正式溝通的方式，以促進新服務開發的相關資訊或知識的流通(例如：例行進度會議、操作手冊、規格文件等方式)？溝通頻率為何？

8.請問貴公司人員與服務供應商之間如何透過非正式溝通(例如:人員溝通、電話溝通與電子郵件等方式)方式，以促進新服務開發的相關資訊或知識的流通?溝通的頻率為何?

9.請問組織間知識流通過程的品質，是否會影響新服務開發速度? 請說明如何影響?

10.請問貴公司在MMK服務的開發過程中,貴公司內部各部門如何透過正式溝通(例如：例行進度會議、操作手冊、內部刊物等方式)的方式，以促進新服務開發的相關資訊或知識的流通？溝通頻率為何？

11.請問貴公司內部各部門人員之間如何透過非正式溝通(例如:人員溝通、電話溝通與電子郵件等方式)方式，以促進新服務開發的相關資訊或知識的流通?溝通的頻率為何?

12.專案人員如何將已獲取的外部知識由個人移轉至組織層級，以累積組織的知識與能力(例如：專案資料庫、教育訓練等方式)？請問貴公司內部知識流通過程的品質，是否會影響新服務開發速度? 請說明如何影響?

服務名稱:MMK 服務

訪談對象:以服務供應商內部參與 MMK 服務開發之相關人員

訪談大綱

1.請問貴公司於便利商店業者新服務開發流程中的那一個階段加入 MMK 服務的開發？並請加以說明合作的緣由。而此項服務的開發，貴公司提供那些創新行為或改變(例如:消費者使用介面、服務傳遞系統、技術功能等方面)?

2.請問在 MMK 服務開發過程中，貴公司與便利商店業者分別扮演何種角色? 而雙方執行的工作內容分別為何？

3.請問貴公司與便利商店業者是採用何種合作方式(例如：合約開發、協同開發或共同開發等方式)去開發 MMK 服務？請問貴公司與便利商店業者所採用的合作方式，是否會影響新服務開發的速度? 請說明如何影響?

4.請問貴公司與便利商店業者之間相互依賴程度(例如:供應商特定價值資源或知識、股權持有或轉換成本等因素)為何? 請問您認為組織間相互依賴程度是否會影響新服務開發的速度? 請說明如何影響?

5.貴公司與便利商店業者之間信任程度(例如:供應商的能力、經驗與商譽等因素)是否會影響新服務開發的速度? 請說明如何影響?

6.請問貴公司在 MMK 服務的開發過程中，貴公司與便利商店業者之間如何透過正式溝通的方式，以促進新服務開發的相關資訊或知識的流通(例如：例行進度會議、操作手冊、規格文件等方式)?溝通頻率為何？

7.請問貴公司人員與便利商店業者之間如何透過非正式溝通(例如:人員溝通、電話溝通與電子郵件等方式)方式，以促進新服務開發的相關資訊或知識的流通?溝通的頻率為何?

8.請問組織間知識流通過程的品質，是否會影響新服務開發速度?請說明如何影響?