

Open Innovation Stages in the Service Sector

Pimprabha Sirito

School of Mechanical and Manufacturing Engineering
The University of New South Wales (UNSW)
Sydney 2052, Australia
pim_sirito@hotmail.com

Maruf Hasan

School of Mechanical and Manufacturing Engineering
The University of New South Wales (UNSW)
Sydney 2052, Australia
m.hasan@unsw.edu.au

Abstract

Open innovation is a paradigm proposing that companies can benefit from using external pathways and knowledge and that firms should cross their boundaries in the product development and innovation management. Since several firms have gained success from practicing open innovation, the paradigm has received high attention from the academia and businesses. However, in spite of the service sector's high economic contributions, open innovation in the sector is still under-researched. This study focuses on open innovation stages in the service sector and identifies the important processes and barriers in each stage. The results include four stages of open innovation implementation and insights on processes including process selection, partner selection, goal setting and influential factor control. The information used in this study came from the interviews with service companies in Thailand from three industries, which include financial intermediation, telecommunications and knowledge-intensive industries. The study closes the gap in the academic area as well as provides managerial insights and guidelines for service companies to adopt open innovation more effectively.

Keyword

Innovation, open, service, knowledge

1. Introduction

Open innovation refers to a paradigm proposing that firms should go beyond their boundaries in product development. Ideas do not always have to be initiated or developed within the companies. In other words, companies should combine external knowledge with the internal knowledge pool or take the internal ideas to develop outside in their innovation management. To practice open innovation, firms need to have a business model that integrates the external and internal knowledge to create value and to capture that value. (H. W. Chesbrough, 2003)

Studies on open innovation were commonly focused only on the manufacturing sector. However, no study particularly emphasizes on how service companies implement open innovation although the service sector generate the highest contribution towards the economy in today's industrialized world. Even though there is evidence that service companies have adopted open innovation, the insights on the implementation process has not been sufficiently known and documented. (Mention, 2011; Mention & Asikainen, 2012; Patrick Schueffel, 2015) Therefore, because of the rising importance of the service sector, it is worthwhile to explore the stages in open innovation implementation in service firms.

This study aims to answer the questions: what are the stages in open innovation implementation in the service sector and what are the important processes and barriers in each stage? The stages were determined to understand the steps firms have to go through in the open innovation implementation. Identifying the important processes provides the firms with the guidelines on how to implement open innovation effectively. Furthermore, by knowing the barriers, firms could be aware of the challenges they might face and prepare some mitigation

plans to avoid them. This study focuses on companies in financial institutions, telecommunications and knowledge-intensive industries which were selected due to the industries' rapid growth in gross domestic product (GDP) shares in the last two decades. (Eichengreen & Gupta, 2013) This study begins with the literature review and the research question. Next is the methodology, followed by the results. The study ends with the conclusion which also includes the managerial implications, limitations and future work.

2. Literature Review and Research Question

2.1 Open Innovation

Principles of open innovation differ from those of closed innovation. Firstly, while closed innovation suggests that firms have to initiate, develop and commercialize the ideas themselves in order to gain the most profit from R&D, open innovation proposes that companies do not have to both discover and develop the ideas in order to benefit from them. External ideas can create additional values that cannot be achieved by internal ideas. Secondly, closed innovation gives importance to getting to the market first while open innovation prioritizes business models over getting to the market first.

Thirdly, on one hand, closed innovation says that the companies have sufficient and the best resources within the firms and developing a lot of ideas is the key to success. On the other hand, open innovation suggests that not all best or useful resources are within the firms and the integration of internal and external ideas is better than creating the most ideas. Another difference is that under closed innovation, firms believe that their intellectual property should be tightly controlled so that others cannot make use of it. Also, they should not make use of others' intellectual property. However, under open innovation, firms can generate profit by allowing others to make use of their intellectual property and incorporating others' intellectual property.

Several factors had led to the fall of closed innovation at the end of the twentieth century. First factor is the mobility of skilled workers. These individuals took the knowledge and capabilities they gained from their former employers to the new companies. Second factor is the growth in number of individuals with higher education. This allowed knowledge to be moved from research centres and large companies to small organizations. Third factor is the rise in the number of private venture capitals that specialized in creating new firms. Other factors include the increase in well-informed customers, faster time to market and shorter shelf life of high-tech products. (H. W. Chesbrough, 2003)

Business model is important and greatly affects the effectiveness of open innovation. (Saebi & Foss, 2015) (H. Chesbrough, 2010) Saebi & Foss studied the effect of open innovation strategies on different practices and come up with appropriate models. (Saebi & Foss, 2015) Appropriate business models depend on how knowledge is transferred in open innovation strategy as categorized into market-based, crowd-based, collaborative and network-based. The first two are when firm seeks knowledge from what already exists in the market. The latter two strategies are when firm forms closed relationship with external firm. The business models for these strategies differ in terms of content, structure and governance. The network-based strategy should have highest content and governance and multilateral structure while market-based strategy should have lowest content and governance and unilateral structure. The degree of content, governance and structure for collaborative and crowd-based strategy lies somewhere in between those of network and market-based with those of collaborative strategy being more similar to those of network-based.

As the key to open innovation is to integrate the right knowledge and to do so in the right way, Wallin & Krogh developed five-step model to design an open innovation strategy. (Wallin & Krogh, 2010) The first step is to define the tasks and schedule them along the timeline. Secondly, relevant knowledge and their sources are identified. Thirdly, how the external and internal resources are used in the open innovation process is defined. This step also includes defining how knowledge is integrated. Fourth step is to create appropriate governance system with the external party. Fifth step is to generate balance in the motives and controls over the expected output.

Open innovation has widely been implemented in several countries. One indicator is the open government partnership. In 2011, eight founding governments, including United States, Brazil, Indonesia, Mexico, Norway, the Philippines, South Africa and the United Kingdom, launched Open Government Partnership. Since then, the partnership now consists of 70 participating countries. All these governments collaborate to improve public services and governance through the use of new technologies. Other purposes are to support openness and to encourage public participation in government activities.

There have been a few studies on open innovation focusing on particular countries. For Asia Pacific, there are studies in Japan and China. In Japan, the purpose of open innovation mostly was to help Japanese companies serve international market not the Japanese markets. Also, there was no venture capital in Japan since the purpose of venture capital was fulfilled by the main banking system. This affected how companies implemented open innovation. (H. Chesbrough, 2013) In China, open innovation was supported at the national level as government policy supported knowledge-sharing at the inter-organizational level. However, some cultural barriers, such as hierarchy attitude within firm and reluctance to move away from conventional method, obstructed open innovation. (Wang & Mitkova, 2016)

Companies in other continents have practiced open innovation. More than 70% of the companies in the United States and Europe have practiced open innovation. (H. Chesbrough & Brunswicker, 2014) Also, 32.5% of SMEs in Germany, Austria, and Switzerland have practiced open innovation. (Vrande, Jong, & Vanhaverbeke, 2008) One study was focused on the Netherlands. Dutch companies mainly implemented inside-out process through patent licensing and spin-offs. Dutch SMEs had more open attitude than larger firms because they had low R&D capacity and, therefore, had to use knowledge from external sources. (Meer, 2007)

2.2 Categorization of the Service Sector

Eichengreen and Gupta (Eichengreen & Gupta, 2013) categorized service industries based on the changes in their shares of Gross Domestic Product (GDP). The first category (Traditional) includes industries with decreasing GDP shares, which are public administration, retail trade, transport and storage and wholesale trade. The second category (Hybrid) includes those with gradually increasing GDP shares, which are hotels, restaurants, health work, social work, education, other community and personal services. The third category (Modern) includes industries with rapidly rising GDP shares, which are financial intermediation, telecommunications and knowledge-intensive services (computer, legal, technical and advertising services). Industries in this last group provide tradable services and use high extent of ICT and skilled labor.

The categorization of service industries indicates that firms in different industries hold different characteristics and working processes. Additionally, as concluded from the work by Storey, Cankurtaran et al., the dissimilarities between innovations within each type of services are as significant as the dissimilarities between products and services. (Storey, Cankurtaran, Papastathopoulou, & Hultink, 2016) Hence, each category of the service sector should be considered separately in this study.

2.3 Research Question

Most of the works on open innovation emphasize on the manufacturing sector. Although the economic contribution and importance of the service sector has been increasing, open innovation in service sector is still under-researched. Therefore, to close this academic gap, it is worthwhile to explore the open innovation stages or processes in the service firms. As open innovation strategy changes according to the corresponding situation, only the modern category of Eichengreen and Gupta (Eichengreen & Gupta, 2013) was focused. The category was selected because of the group's significant rise in GDP shares which shows its importance to the economy.

This study aims to answer the questions: what are the stages in open innovation implementation in the service sector and what are the important processes and barriers in each stage? The stages were determined to understand the steps firms were expected to follow in the open innovation implementation. The process could help provide the firms the guidelines on how to implement open innovation effectively. Furthermore, by knowing the barriers, firms could be aware of the obstacles they might face and prepare some mitigation plan in order to avoid them.

3. Methodology

This study was conducted through interviews. Interviews can provide the interviewees' opinions on the research questions and information that does not exist in the literature. Although there is no definite rule on the sample size of interviews, several researches have shown that the sample size should be more than 10 but lesser than 50 interviews as too many interviews may alter the results. (Ritchie, Lewis, & Elam, 2003) (Mason, 2010) Data was gathered from interviews with 13 service firms in Thailand. The interviews were either conducted face-to-face or via telephone. The 13 interviewed companies were chosen according to their industries and consist of 5 financial intermediations, 3 telecommunications and 5 knowledge-intensive companies.

The interview was conducted using the structured open-response approach. The interviews consisted of open-

ended questions which were asked in a specific order. (King, Cassel, & Symon, 1994) The interviewing process comprised three phases. The first phase was the beginning of the interview which mainly contained general questions, such as the firm's background information. The second phase included more detailed questions. Thirdly, the interview concluded with an opportunity for the participants to freely give comments. (King et al., 1994)

In analysing the interview results, the high-level stages were first derived from the interviewees' description of how they implemented open innovation. The process sections were, then, created based on the analysis of the trends and likelihood to occur of each possible implementation options. Lastly, the barriers were identified.

4. Results

4.1 Initial Stage

In this initial stage, the firms realized the needs to practice open innovation and decided to implement the strategy. Here, they develop a high-level concept of how they want to implement open innovation. The firms had a choice of three concepts to choose from as described below.

4.1.1 Process Selection

The three open innovation processes include the outside-in, inside-out and coupled processes as identified by Gassmann & Enkel. (Gassmann & Enkel, 2004) The outside-in process is when firms take external knowledge into the company to fulfil their internal knowledge pool. Inside-out process refers to taking internal ideas outside the companies to leverage their own knowledge and to gain advantage from exposing ideas to others. Coupled process is the combination of the outside-in and inside-out processes to generate two-way benefits. (Gassmann & Enkel, 2004) From the interviews, these three processes were adopted for various purposes and trends in process selection could be seen.

For the three industries, the outside-in process was adopted for new product development purpose. Companies practiced the outside-in process with the incentive to gain additional knowledge and skills. Moreover, in other rare occasions, the outside-in process was implemented for human resource and marketing purposes. All of the three industries practice the inside-out process for human resource and branding purpose. Nevertheless, only the knowledge-intensive firms adopted the inside-out process for new product development purpose.

The coupled process was practiced through merger and acquisitions. Companies implemented coupled process to develop new product to gain competitive advantage. Moreover, in some cases, the outside-in process eventually turned into the coupled process because, as the knowledge transfer intensified, the knowledge gradually transferred in only one direction.

Firms in each industry exhibited different rate in practicing each type of process. Telecommunications and financial intermediation firms frequently practiced outside-in process while the knowledge-intensive companies often adopted the inside-out. For the coupled process, the rate was equally distributed among the three industries.

The above trends could be described by the characteristics and nature of the industries. The knowledge-intensive companies usually have rich knowledge pool compared to firms in the other two industries. Part of the services knowledge-intensive companies offer is to deliver the specialized and technical capabilities. Hence, this characteristic of the knowledge-intensive firms leads to them being the partner that provides knowledge to others. In other words, firms in knowledge-intensive industries are more likely to implement inside-out process than companies in the other two industries.

Both telecommunications and financial intermediation firms have intensive use in technology. Therefore, it is crucial for them to keep update with the technological advancement to successfully compete in the market. As keeping on track with the technological advancement is not their main service, firms might not have the skills and capabilities to compete in terms of technology by themselves. They are usually less creative in bringing ideas into reality. Hence, they are more likely to practice outside-in process.

The rate in implementing the coupled process depended on the economic situation and the firms' strategic direction. No trend could be observed for the three industries. In other words, the likelihood in adopting coupled process is not related to the characteristics or the nature of the industry.

4.1.2 Barrier

Barriers during this stage are those that obstruct the companies from deciding to implement open innovation. These barriers cannot be controlled and are due to the external environment of the firms. While telecommunications firms did not report any difficulty in this stage, knowledge-intensive and financial intermediation companies reported some uncontrollable barriers. These barriers include the sizes of the firms and the nature of the industries.

Firms' sizes stopped them from practicing open innovation because it was more difficult for small-to-medium companies to find an appropriate partner due to the lack of connections. Small companies also lacked the skills and human resource capabilities in handling the partnership. Moreover, they felt that the complicated paper works and the effort did not worth the benefits as they had to sacrifice part of their services.

Second barrier is the industry nature. Knowledge-intensive companies usually dealt with sensitive information. Implementing open innovation, companies had high risk in exposing the confidential information to their partners which could negatively affect the firms. The risk involved and the extra caution required lowered the tendency for knowledge-intensive companies to adopt open innovation.

Financial intermediation firms involved high degree of bureaucracy which slowed down the open innovation implementation. Also, the financial intermediation industry is a regulated industry meaning that firms must follow a set of rules limiting open innovation possibilities and slowed down the process. Moreover, financial firms had to work with confidential information. Hence, they also had risk in exposing the information during implementing open innovation. Additionally, the financial intermediation industry is sensitive to economic condition. Hence, firms could feel reluctant to adopt open innovation practice under hostile economic situation.

4.2 Planning Stage

The planning stage is where the firms prepared for open innovation implementation and created a high-level plan. The working team was formed. Team consisted of representatives from different department or the staff in the product development department. Another important step in this stage is partner selection. Generally, partner was selected based on business requirements written by the firms. Business requirements were carefully written and addressed the desirable knowledge or benefits. Two guidelines could be considered in partner selection process. The first guideline was based popularity and effectiveness while the second one was based on the contribution of the partner.

4.2.1 Partner Selection: Popularity and Effectiveness

According to the Community Innovation Survey (CIS), there are 7 types of open innovation partners including customers, science-based companies, competitors, higher-education institutions, suppliers, public sector and companies in different industries. Customers are the entities who get the service offering. Suppliers are the companies working along the value chain. Competitors refer to the firms in the same industry. The popularity was measured in terms of the rate the partner was selected while the effectiveness was measured in terms of new product development.

For financial intermediation and telecommunications firms, suppliers were the most popular and effective type of partner. This can be explained by two reasons, the existing relationship and the established understandings of the partners. Competitors were also a popular and effective partner. One reason to explain the case is that the partnering firms both share some knowledge and characteristics leading to successful collaboration.

Customers were the most effective and popular partner for the knowledge-intensive firms. This can be explained from the nature of the industry that frequently adopt inside-out process with customers. However, for financial intermediation and telecommunications companies only resulted in neutral outcome from open innovation process with customers.

Open innovation process with higher-education institutions led to neutral outcome. The partnership with the science-based gave positive result only in the telecommunications industry. Additionally, only telecommunications firms partnered with and gained positive outcomes from other businesses partnership. None of the interviewed firms partnered with the government.

Some conclusions could be observed from this section. Firstly, the characteristics of the industry affected the popularity of the partner type selection. Knowledge-intensive companies usually partnered with customers because of the high extent of work had to deal with confidential information. Moreover, the popularity and effectiveness of working with suppliers and competitors showed that the established understandings of the partnering firms, their customers and their market conditions were necessary for open innovation partnership. Also, the shared characteristics between companies were essential for successful partnership as indicated by the rare partnership with companies in different industries.

4.2.2 Partner Selection: Contribution

Another area to look at for partner selection is the contribution of that partner. The partner types exhibit their own roles and contribution as explained below.

Companies partnered with customers to study about the customers' needs and wants. The ideas given from customers were more relevant and closer to their actual needs. However, the partnership with customers in telecommunications and financial intermediation companies resulted in neutral outcomes. This situation can be because the idea created by customers might only suit a specific customer group. Moreover, the customers might have difficulty in explaining their ideas and translating their needs into words accurately. For this type of partnership in the knowledge-intensive firms, companies participated in the product development and successfully provided the customers' missing knowledge and skills.

Suppliers were the knowledge giver due to two main reasons. First is the already established relationship which eased the required processes such as the knowledge transfer process and employee involvement. Secondly, the suppliers had prior understandings of the firms' product and business. On the other hand, the firms also had prior understandings of the suppliers' knowledge and skills making the partnership easily succeed.

The partnership with higher-education institutions was aimed for human resource purposes. Higher-education institutions were the knowledge receiver and usually firms did not expect to gain knowledge from the partnership. Only telecommunications firms gained knowledge from higher-education institutions and developed new product from the partnership. However, the resulting product did not bring about tremendous success.

Competitors were the knowledge giver in the development process but generally were not idea creator. Although the partnership rarely occurred, the science-based companies were the knowledge giver in fulfilling the companies' knowledge source. Only telecommunications firms reported to have partnered with companies in different industries. These partners were start-ups and served as both the idea generator and knowledge supplier in the product development process.

4.2.3 Barriers

In this stage, the firms reported that they had difficulties in selecting partner for the open innovation process because no written guidelines existed. They were unsure of which partner to select and were concerned about the ending results in selecting the partner. Hence, business requirements needed to be carefully written to state the needs and goals of open innovation implementation.

4.3 Development Stage

In the development stage, firms had a concrete idea on what to do with the knowledge and developed a detailed plan. The plan also included the preparation process for the actual implementation. Here, the firms communicated the directions they were going and started to follow the plan in preparing themselves for the next stage. In developing the plan, the staff needed to identify the balance between short and long-term goals. The short and long-term goals could be set based on the expected outcomes of open innovation implementation. Hence, by knowing the short and long-term outcomes, firms can easily determine the goals of open innovation and prepare for the knowledge transfer process effectively.

4.3.1 Short-term Goal Setting

Open innovation implementation resulted in successful new service development and the product launch. Better ideas were created. The development of new service improved due to the intensive knowledge integration from several inputs. Product better met customers' needs because of the variety of knowledge sources used in the

product and precise interpretation of customers' wants and needs. The new service was more innovative which significantly defined the success of the product in these industries. Moreover, the development of the service could be done through a wide-range of options since the development approach did not have to come from sources within the firms' boundaries. The commercialization part was enhanced due to well-planning and more equipped staff resulting in shorter time-to-market. Also, the rise in sales volume of both the existing and new services occurred. Hence, the short-term goal of open innovation can be set in terms of commercial success.

4.3.2 Long-term Goal Setting

Long-term goals can be set in terms of competitive advantage. For instance, firms gained competitive advantage in the wider knowledge and capability pool. For the three industries, the knowledge and capabilities were important assets. External partnership helped companies stay update with the technology, keep up with the markets and rapidly changing customers' needs. Through open innovation, companies quickly obtained capabilities that they were missing and that they could not develop on their own. The gained capabilities created opportunity to provide more or new service offerings.

Secondly, firms widened their connections and gained access to larger customer groups. Practicing open innovation, firms gained connections with the partnering firms' customers which gave them opportunity to increase the market share. The relationships with partners facilitated business activities. Companies had more flexibility in doing their business because of the wider range of possible methods and options.

Thirdly, firms gained competitive advantage and ensured their long-term success through the enhanced brand image. Brand image was upgraded through the firms' success and performance improvement. Moreover, partnership with external entities promoted the brand of the firms. Consequently, the success in new service launch defined the companies' capabilities ultimately boosting the brand image.

4.3.2 Barriers

One barrier in this stage is the organizational barrier. Firms feared and were unwilling to have organizational change. Employees were afraid to change how they were working for the following reasons. Firstly, they did not want to rely on external partner. Secondly, the staff had difficulty in identifying the balance between working on open innovation activities and on their daily functions. Moreover, some companies preferred to look for skills within their corporate group. The notion of change brought about stressful situation because of the unwanted changes in work norms.

4.4 Implementation Stage

Implementation stage is where the transfer of knowledge occurred. During the implementation process, firms needed to work closely with their partners. Firms must ensure that they had all the information required by clearly defining the roles of partnering team and having accessibility to the tools involved. Progress was measured through evaluation approaches and employees were rewarded for their performance. The knowledge transfer process had to be beneficial to all entities involved and complemented one another's knowledge source. The internal staff must know how to absorb the outcomes of the knowledge transfer process. In this stage, there are some factors that companies need to be aware and focus on in order for the open innovation goals to be met.

4.4.1 Influential Factor Control

Companies needed to give focus on three influential factors in the open innovation implementation. Firstly, the organizational climate had to promote openness. Organizational culture reflected the eagerness, trust and attitude of staff towards partnering team and the overall open innovation strategy. The companies had to view the strategy, not only as financial gain, but also as an opportunity to improve the performance and to gain competitive advantage.

Secondly, the employee had to be open-minded about the strategy and all the processes required. The management also must be open to new options. Everyone had to keep in mind of the incentives and goals of open innovation implementation. They had to be eager to share knowledge and work with the external team.

Additionally, the firms had to be prepared in terms of the tools and infrastructure. Partnering team must be able to gain access to the tools and the knowledge pools to transfer knowledge effectively. This accessibility also led to transparency in the process and allowed progress to be tracked. The access to the infrastructure

brought about trust and full utilization of knowledge integration. It also allowed staff to perform their tasks effectively.

4.4.2 Barriers

The first barrier in this stage is the unequipped human capital. Companies lacked the managerial skills and experience to handle the processes required. To work with external team effectively, companies must invest in human capital in terms of developing skills and mindset for the open innovation. However, this process was costly and required a lot of time to achieve. This barrier was most severe in the knowledge-intensive firms because of the high turnover rate. Investing in human capital did not worth the resulting benefit.

Second barrier is the reluctance to transfer and accept knowledge. Staff were unwilling to share knowledge as well as to accept new knowledge. They had negative feelings towards the working with partnering teams. This resistance in knowledge transfer process greatly affected the effectiveness of open innovation strategies.

Additionally, companies had trouble in the knowledge-transfer process. Firms did not know how to transfer knowledge because no written steps on how to do so existed. This effect worsened when knowledge was in intangible form which had to be translated into understandable manner. Intangible knowledge is often embedded in the staff meaning that the knowledge transfer greatly relied on people. The knowledge transfer process was easier and less complicated when the knowledge was able to be written in documents that could be easily transferred.

5. Conclusion

5.1. Conclusion

As open innovation is a contingent concept, open innovation in the service sector cannot be treated similarly to those in other sectors. Despite the increasing importance and contribution of the service sector to the economy, open innovation in the service sector is still insufficiently researched. Hence, studying on open innovation process in service firm can provide insights to the research area and useful managerial implications for service companies.

This study leads in the four stages of open innovation implementation in the service sector as well as the main processes and barriers involved in each stage. The selected industries of the service sector include financial institutions, telecommunications, knowledge-intensive industries. The results of the study can be used as guidelines for companies to practice open innovation more effectively.

The first stage is the initial stage where the firms realize the needs to practice open innovation and decide to implement the strategy. The main process in this stage is to select the type of open innovation process which is largely influenced by the nature and the characteristics of the industries influence the type of open innovation process. For the service firms, telecommunications and financial intermediation firms usually practice outside-in process while the knowledge-intensive firms often practice inside-out process. The barriers in this stage are the firms' sizes and the nature of the industries which obstruct firms from implementing open innovation.

The second stage is the planning stage where the firms create a high-level plan for open innovation implementation. The main process in this stage is partner selection which can be done based on the types of partners and their contributions. The barrier was the difficulty in partner selection as firms had little knowledge about how to select partners.

The third stage is the development stage where the firms develop a detailed plan and communicate the directions they are going. The main process is to develop a plan in which the short and long-term goals have to be determined. By knowing the expected short and long-term outcomes of open innovation, firms can easily set the actual goals. The barrier in this stage is that the firms fear and have trouble in adapting to organizational change.

The fourth stage is the implementation stage where the knowledge-transfer process takes place. In this stage, it is important for the firms to pay attention to the influential factors. The firms need to have an open culture, open-minded staff and equipped infrastructure. The barriers in this stage are the unequipped human capital, resistance to knowledge transfer and the actual knowledge-transfer process.

5.2. Managerial Implications

The true success factor of open innovation implementation is how well the resulting product meets customers' needs. This shows that open innovation is a contingent paradigm and that there is no clear specific rules in implementing open innovation strategy. The strategy is to be determined by the companies at their corresponding specific situation. Nevertheless, some guidelines can be used to provide ideas for managers to consider in forming and implementing open innovation strategies.

In the initial stage, the managers' main task is to select the process. The managers need to keep in mind that the industry affects the likelihood of adopting open innovation process. Financial institutions and telecommunications companies often practice outside-in process because their industries use high degree of knowledge and technology but might be low on researching or gathering new knowledge on their own compared to knowledge-intensive firms. On the other hand, knowledge-intensive firms usually practice inside-out process because they are knowledge and capability provider in profession and have high researching capabilities compared to the other two industries.

In the planning stage, managers need to select the open innovation partner. For partner selection, it is likely that open innovation partner is the one that has some understandings of the industry and the firms such as firm's customers and products. Established relationship prior the implementation facilitates open innovation activities. Financial institutions and telecommunications firms often benefit from partnering with suppliers and competitors. Knowledge-intensive firms often partner with customers effectively.

The corresponding industry of the firms affects their open innovation strategies. Hence, managers need to consider the impact of their corresponding industries and industrial barriers. Despite these findings about process and partner selection, managers are encouraged to be innovative, willing to invest and openminded in open innovation strategy formation to differentiate themselves from competitors.

In the development stage, the knowledge preparation process depends on the type of knowledge. The employees need to understand the firm and partner's capabilities and the purpose of the partnership. Additionally, the management needs to support the open innovation strategy by investing in infrastructure required to implement the strategy effectively. The infrastructure needs to be ready in a way that allows some degree of accessibility to the partners and that allows transparency in the process.

In the implementation stage, the managers need to encourage the staff to get involved in the knowledge transfer as much as possible as well as make the most of the infrastructure and new technical tools. Also, as the staff might have some negative feelings towards the partnering team, managers need to ensure that both the internal and external communication is sufficient. Moreover, the knowledge transfer process itself can be problematic. The team may be unwilling to share their knowledge to the partner. Hence, managers need to inform the team members about the value of knowledge transfer and the overall purpose of the open innovation.

Additionally, during the implementation stage, one of the issues is the increase in the risks involved. The companies are more open and they risk in exposing sensitive information to the partner. To mitigate the risk, the role of the partner and team members needs to be clearly defined. Also, some sort of risk-related agreement or risk management scheme needs to be created and agreed among partners. The amount of information flow needs to be defined.

Apart from the mentioned points in the open innovation stages, managers need to also hold certain characteristics for successful implementation. Firstly, managers need to be up-to-date with the technological advancement and consistently monitor the changing customers' needs. This is crucial for managers to prepare their resources, including the staff, in time and to notice the possible way for the firms to benefit from open innovation cooperation.

Secondly, the managers need to understand the importance and impact of the customers' needs. In the implementation, some criteria and business requirements need to be created according to the corresponding situation. This step is significant to the success of the strategy and depends on how well the managers can interpret the market situations and the needs of the company. Managers are encouraged to be innovative and openminded to the use of both internal and external resources to gather information about customers' needs as much as possible in setting up these criteria.

Thirdly, managers need to ensure that teams value the open innovation process and develop clear understanding. Both the staff and partnering team need to fully understand the project goals, their responsibility and the expected contribution to the open innovation projects. Teams have to acknowledge the value-added process of

open innovation. The clear understanding of these aspects can be generated by having sufficient communication within and between teams. By doing so, managers can ensure that the negative feelings towards partnering team are reduced and willingness to transfer knowledge is created.

Lastly, managers need to ensure that the firms have a dynamic environment that supports flexibility. The management style has to support open innovation by encouraging staff to be innovative and have an appropriate mindset. The staff are allowed to make mistake and learn from them. They can present ideas and successful achievers are rewarded. Workshops or activities need to be regularly held to encourage staff to be openminded and have the appropriate skills. However, achieving appropriate company culture and environment is a long-term process which requires time to be met. Therefore, the management needs to be up-to-date to technological advancement in order to equip their staff in time.

5.3. Limitations

Limitations in this study include the followings. Firstly, the interview participants only include companies in Thailand. Therefore, the findings may be influenced by national factors. Secondly, the companies selected might not be accurate representatives of the industries and, therefore, limit the results. Third reason is the study approach as the interviewees might just give partial answer.

5.4. Future work

Firstly, since the data was gained from companies in Thailand, similar study can be done by interviewing firms in other countries. Secondly, study can be done in the knowledge transfer process as companies reported to have challenges in implementing this process. Additionally, similar study can be done on other industries since this study only focuses on only one category of the service sector.

6. References

- Chesbrough, H. (2010). Business Model Innovation: Opportunities and Barriers. *Long Range Planning*, 354-363.
- Chesbrough, H. (2013). *Open Innovation: The Response of Japanese Firms*. Retrieved from
- Chesbrough, H., & Brunswicker, S. (2014). A Fad or a Phenomenon?: The Adoption of Open Innovation Practices in Large Firms. *Research-Technology Management*, 57(2), 16-25.
doi:10.5437/08956308X5702196
- Chesbrough, H. W. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Publishing Corporation.
- Eichengreen, B., & Gupta, P. (2013). The two waves of service-sector growth. *Oxford Economic Papers*, 96-123.
- Gassmann, O., & Enkel, E. (2004). *Towards a Theory of Open Innovation: Three Core Process Archetypes*. Retrieved from
- King, N., Cassel, C., & Symon, G. (1994). The Qualitative Research Interview: In Qualitative methods in organizational research
A practical guide. *London, Sage Publications*.
- Mason, M. (2010). Sample Size and Saturation in PhD Studies Using Qualitative Interviews. *Forum: Qualitative Social Research*, 11(3). doi:<http://www.qualitative-research.net/index.php/fis/article/view/1428/3027#g12>
- Meer, H. V. D. (2007). Open Innovation – The Dutch Treat: Challenges in Thinking in Business Models. *Creativity and Innovation Management*, 192-202.
- Mention, A.-L. (2011). Co-operation and co-opetition as open innovation practices in the service sector: Which influence on innovation novelty? *Technovation*, 31(1), 44-53.
- Mention, A.-L., & Asikainen, A.-L. (2012). Innovation & Productivity: investigating effects of openness in services. *International Journal of Innovation Management*, 16(03), 1240004.
- Patrick Schueffel, I. V. (2015). Open Innovation in the Financial Services Sector - A global literature review. *Journal of Innovation Management*, 25-48.
- Ritchie, J., Lewis, J., & Elam, G. (2003). Designing and selecting samples. *Qualitative research practice: A guide for social science students and researchers*, 2, 111-145.
- Saebi, T., & Foss, N. J. (2015). Business models for open innovation: Matching heterogeneous open innovation strategies with business model dimensions. *European Management Journal*, 201-213.
- Storey, C., Cankurtaran, P., Papastathopoulou, P., & Hultink, E. J. (2016). Success Factors for Service Innovation: A Meta-Analysis. *Journal of Product Innovation Management*.

- Vrande, V. v. d., Jong, J. P. J. e., & Vanhaverbeke, W. (2008). Open Innovation in SMEs: Trends, motives and management challenges: Elsevier.
- Wallin, M. W., & Krogh, G. V. (2010). Organizing for Open Innovation: Focus on the Integration of Knowledge. *Organizational Dynamics*, 145-154.
- Wang, X., & Mitkova, L. (2016). Research on China's knowledge-sharing system: under open innovation framework. *International Journal of Management and Enterprise Development*, 15(2-3), 230-242. doi:doi:10.1504/IJMED.2016.078215

7. Biographies

Pimprabha Sirito is currently a management consultant with experiences in project management, change management and cost model development. She has worked with clients from various industries, for instance the manufacturing industry and the energy and utilities industry. She holds a Bachelor of Engineering degree in Mechanical and Manufacturing Engineering (Honours Class 1) from the University of New South Wales.

Maruf Hasan is with the School of Mechanical and Manufacturing Engineering at the University of New South Wales. His research interests include:

- **Quality Management**
Implementation of ISO9000/14000 and its effect on organisational performance. Total quality management and business excellence.
- **Supply Chain and Logistics Management**
Effect of e-commerce on supply chain management. Supply chain environmental management and its impact on environmental and operational performance. Performance management in supply chain.
- **Manufacturing Strategy**
Investigation of manufacturing strategy process using qualitative and quantitative empirical studies.