The Role of Ambidextrous Capabilities and Advanced Users on Outsourcing Service Providers’ Innovation Performance

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Doctor of Philosophy in Management

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Declaration

I hereby certify that the work embodied in the thesis is my own work, conducted under normal supervision.

The thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968.

Signed: 

Fatemeh Kanani Moghadam

Date: 28/12/2018
Acknowledgment

To:

My family and friends, thank you all

“Forget who hurt you yesterday, but don’t forget those who love you every day.

Forget the past that makes you cry & focus on the present that makes you smile.

Forget the pain, but never the lessons you gained.”
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<th>Description</th>
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<tr>
<td>CAP</td>
<td>Customer-active paradigm</td>
</tr>
<tr>
<td>fsQCA</td>
<td>Fuzzy set qualitative comparative analysis</td>
</tr>
<tr>
<td>IAOP</td>
<td>International Association of Outsourcing Professionals</td>
</tr>
<tr>
<td>MGA</td>
<td>Multiple group analysis</td>
</tr>
<tr>
<td>OLS</td>
<td>Ordinary least squares</td>
</tr>
<tr>
<td>OSP</td>
<td>Outsourcing service provider</td>
</tr>
<tr>
<td>PLS</td>
<td>Partial least squares</td>
</tr>
<tr>
<td>QCA</td>
<td>Qualitative comparative analysis</td>
</tr>
<tr>
<td>SEM</td>
<td>Structural equation modelling</td>
</tr>
</tbody>
</table>
Abstract

As pointed out by Friedman (2005), outsourcing and offshoring are among 10 forces that flattened the world. However, compared with research on outsourcing clients, there is still relatively little knowledge about whether and how outsourcing service providers (OSPs) can benefit from interacting with their customers in the service provision process.

While the majority of organisations view innovation as an internal process, the importance of using external sources of knowledge has been continuously growing. Given the dispersion of valuable knowledge across firm boundaries, achieving external knowledge flows is a critical capability for gaining sustainable competitive advantages.

Drawing upon the theoretical lenses of organisational learning and the customer-active paradigm (CAP), this thesis integrates the role of outsourcing service providers’ internal learning capabilities and external sources of knowledge from customers and examines how combining OSPs’ ambidextrous learning capabilities and knowledge from advanced users can lead to improved OSP innovation performance.

A three-study mixed methods research program is designed to address the research questions. The first study uses multiple regressions and highlights the importance of ambidextrous learning capabilities in service providers (i.e., exploring novel knowledge while simultaneously exploiting existing knowledge), as well as having more sophisticated and more involved customers. The second study uses partial least squares structural equation modelling (PLS-SEM) and complements the first study by showing that sophisticated and involved customers strengthen the positive relationship between ambidexterity and innovation performance in OSP companies. The third study uses fuzzy set qualitative comparative analysis (fsQCA). It confirms the findings of the previous two studies and highlights the importance of OSP–customer collocation.
Chapter 1: Introduction

1.1 Introduction

This chapter provides an overview of this thesis. It begins with the background of this study in Section 1.2, followed by research gaps and research questions in Sections 1.3 and 1.4. Section 1.5 discusses the contributions of this research, and Sections 1.6 and 1.7 outline the structure of this thesis and present a summary of the chapter.

1.2 Background of the Research

Outsourcing is the transfer of business activities to an external supplier, while offshoring refers to a subset of outsourcing with respect to its geographical scope—that is, the repositioning of a firm’s value chain undertakings to a provider in another country (Doh, Bunyaratavej, & Hahn, 2009; Lewin, Massini, & Peeters, 2009; Manning, Massini, & Lewin, 2008; Tadelis, 2007).

As pointed out by Friedman (2005), outsourcing and offshoring are two of ten forces that flattened the world. The other eight forces are the fall of the Berlin Wall, Netscape initial public offering (IPO), workflow software, open source, supply chaining, insourcing, informing and wireless. Friedman (2005) noted that collaboration and outsourcing are commonly accepted business models nowadays. In addition, the business landscape is currently witnessing the widespread migration of service functions from developed nations to several foreign destinations. This occurs as more firms engage in international outsourcing of services to survive in today’s highly competitive business environment.

In essence, the increasing regularity with which firms have been outsourcing their service functions to external providers is a business issue that has constantly merited the attention of practitioners, academicians, consultants and policymakers in recent years (Kedia & Lahiri, 2007). Despite an increase in international outsourcing services and an increase in research on outsourcing, there are still gaps in our understanding of the correlation between participants of outsourcing, including suppliers and customers.

Outsourcing can be understood as the coevolution of organisational factors relating to both clients and providers that enable and drive both parties to engage in outsourcing.
practices (Lahiri & Kedia, 2011). The prevalent insight driving client companies towards outsourcing is that certain service functions can be performed cheaper, better and faster by outsourcing providers (Clott, 2004; Pfannenstein & Tsai, 2004), which indicates the importance of this phenomenon in the domain of research in international business management.

Outsourcing service providers (OSPs) are specialised supplier firms that offer services for clients who use such services from outside their firms’ boundaries (Lahiri & Kedia, 2009). Over the years, research related to outsourcing has mostly been client-centric (Paliwoda, Slater, Chadee, & Raman, 2009) and has overlooked the provider side (Chadee, Raman, & Michailova, 2011; King, 2007; Kotabe, 1993; Lahiri & Kedia, 2009). Although the performance of clients is closely connected to the performance of OSPs (Feeny, Lacity, & Willcocks, 2005), research on the performance of OSPs remains underdeveloped (Chadee et al., 2011). There is still relatively little knowledge about whether and how OSPs can benefit in innovating from interacting with their customers in the service provision process.

Potentially valuable knowledge is spread across firm boundaries; thus, achieving external knowledge flows is critical for firms to achieve sustainable competitive advantages (Colakoglu, Yamao, & Lepak, 2014; Foss & Pedersen, 2004). While companies traditionally view innovation as an internal process, scholars have increasingly emphasised the importance of external sources of knowledge (Chesbrough, 2006; de Wit, Dankbaar, & Vissers, 2007).

The rapid pace of technological change means that OSPs constantly need to innovate to avoid becoming obsolete. Service routines and processes evolve over time; therefore, innovation is critical for the growth of OSPs. Through innovation, OSPs can continually upgrade their existing services or introduce new processes that add value to their customers’ business (Chadee, Sharma, & Roxas, 2017).

1.3 Research Gaps

Outsourcing relationships involve two main parties: the client on the demand side and the providers on the supply side (Raman, Chadee, Roxas, & Michailova, 2013). However, most research in outsourcing focuses almost exclusively on the client perspective and rarely takes the perspective of the service provider (Almeida &
Meneses, 2013; Lahiri & Kedia, 2011; Lahiri, Kedia, & Mukherjee, 2012; Manning et al., 2008; Meneses, Brito, & Gomes, 2016). Compared with research on clients, research on service providers has tended to be overlooked (Aundhe & Mathew, 2009; Lahiri & Kedia, 2009; Lahiri et al., 2012; Mao, Lee, & Deng, 2008).

Like all other firms, OSPs face a challenge in efficiently using limited resources and capabilities to meet customer demand. Accordingly, suppliers of these services need to enhance their capabilities to fulfil the requirements of current and potential clients to survive in the competitive market. However, industry evidence has increasingly suggested that many firms with a high level of learning capabilities fail to deliver innovation and stay competitive in the fast-changing market, implying that innovation requires more than just internal learning capabilities.

The development of innovations and new business increasingly involves two or more actors and often includes a customer and a supplier (Paasi, Luoma, Valkokari, & Lee, 2010). Open innovation (Chesbrough, 2003) and user-driven innovation perspectives (Chesbrough, 2003; Urban & von Hippel, 1988) emphasise the importance of interactions with customers and the transfer of knowledge through such interactions (Piller & Ihl, 2009). The significance of engaging customers in the creation of new products and services has also increasingly been recognised by companies (Payne, Storbacka, & Frow, 2008; Prahalad & Ramaswamy, 2003). Indeed, customers can play an active role as co-creators of knowledge in the innovation process (Prahalad & Ramaswamy, 2003). Hence, providers of products and services have responded to customers’ demands by externally sourcing their innovation from their customers (Paasi, Lappalainen, Rantala, & Pikkarainen, 2014). Access to knowledge from clients is an important source of external learning and can help OSPs to gain new knowledge that can be used to facilitate innovation (Lin & McDonough, 2014; Phene & Almeida, 2008).

However, previous studies have not explored how the various learning capabilities of OSPs can influence the ability to use customers’ knowledge in innovations.

1.4 Research Questions

Based on the literature, the following general research questions are derived:
• To what extent do the learning capabilities of OSPs—in particular, ambidextrous learning—influence their innovation performance?

• Does interaction between service providers’ learning capabilities and lead users influence OSPs’ innovation performance?

• Does interaction between service providers’ learning capabilities and involved users influence OSPs’ innovation performance?

• Is there a difference between the projects with offshore and onshore customers?

Based on these general questions, three studies were conducted, which are described in Chapters 5, 6 and 7. The aim of Study 1 is to investigate the effects of OSPs’ internal learning capabilities and external knowledge from customers, as well as their joint effect on OSPs’ innovation performance.

Study 2 uses partial least squares structural equation modelling (PLS-SEM) to further examine the role of ambidexterity (i.e., ability to simultaneously achieve both exploration and exploitation) in OSPs’ innovation performance and whether its effect varies across different groups of customers.

Study 3 further examines the complex interactions between characteristics of highly innovative service providers and customer characteristics using fuzzy set qualitative comparative analysis (fsQCA).

Table 1.1 shows a summary of the research questions, objectives and research methods used to examine the research questions proposed in each study.

<table>
<thead>
<tr>
<th>Study</th>
<th>Objectives</th>
<th>Method and Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td>Analyse the direct and interacting effects of service providers’ learning capabilities and customers’ characteristics on innovation performance</td>
<td>OLS regression</td>
</tr>
<tr>
<td>Study 2</td>
<td>Examine differences in the relationship between various groups of customers and ambidexterity in enhancing OSPs’ innovation performance</td>
<td>PLS-SEM</td>
</tr>
<tr>
<td>Study 3</td>
<td>Investigate all possible configurations of service providers’ characteristics, learning capabilities and customer characteristics that lead to superior innovation performance</td>
<td>fsQCA method</td>
</tr>
</tbody>
</table>
1.5 Research Contributions

This study proposes that combining OSPs’ learning capabilities and their customers’ knowledge plays a crucial role in driving OSPs’ innovation performance. Thus, it is important that OSPs possess knowledge and learning capabilities that are at a level comparable with that of their customers.

Although the role of learning capabilities in innovation performance (e.g., Benner & Tushman, 2003; He & Wong, 2004; Raisch, Birkinshaw, Probst, & Tushman, 2009) and engaging customers in the creation of new products and services (e.g., Chesbrough, 2003; Prahalad & Ramaswamy, 2004a; Urban & von Hippel, 1988) has been widely investigated in firms, the interaction between internal capabilities and external knowledge flow from customers remains largely underresearched.

This study advances the current literature on outsourcing and customer-driven innovation and makes several contributions. First, this study confirms the importance of users as a source of innovation and shows how OSPs can leverage their cooperation with customers to achieve higher innovation performance. The importance of external knowledge has been highlighted in studies on open innovation, which emphasise that companies should search for external ideas to enhance their innovation and seek external paths to commercialise their own innovation outputs (Chesbrough & Crowther, 2006; Saebi & Foss, 2015). This is a research stream that is increasingly attracting scholarly attention from a significant number of management and international business researchers (Ikerionwu, Gray, & Edgar, 2014; Lahiri et al., 2012). However, it is relatively unexplored in the context of OSPs. Therefore, this study shows the role of client participation in the innovation process of such firms. Second, this study shows that not all clients are equally important, and that working with lead outsourcing clients exposes OSPs to leading-edge knowledge that can improve innovation. Third, the study shows the importance of having the appropriate learning capability to acquire and apply this new knowledge to improve OSPs’ service, routines and processes.
1.6 Structure of the Research

This thesis is composed of eight themed chapters, as outlined in Figure 1.1. A brief description of each chapter is provided below.
Chapter 1: Introduction
- Background of the research
- Research gaps
- Research questions
- Research contributions
- Structure of the research

Chapter 2: Literature Review
- Outsourcing and offshoring
- Outsourcing service providers
- Customer active paradigm
  - Customer involvement
  - Customer sophistication
- Insights from service innovation
- Organisational learning
  - Exploration and exploitation
  - Organisational ambidexterity
  - Ambidexterity and innovation
- OSP’s learning and innovation in OSPs

Chapter 3: Research Design
- Research paradigm
- Research strategy
- Data collection instrument
- Survey development process
- Sample population
- Data analysis techniques
- Ethical implications

Chapter 5: Interaction analysis between OSPs capabilities and customer characteristics, OLS method
- Methodology
- Measurement
- Hypotheses testing
- Model estimation and results
- Conclusion of Study 1 and main findings

Chapter 6: Multi-group analyses for heterogeneous customers, SEM-PLS technique
- Methodology
- Advantages of using PLS-SEM in this study
- Operationalisation of constructs
- Evaluation of the structural model
- Hypotheses testing
- Conclusion of Study 2 and main findings

Chapter 7: Configurations analysis for highly innovative OSPs, fsQCA technique
- Qualitative comparative analysis
- Advantages of using QCA method
- Fuzzy set qualitative comparative analysis
- Data calibration procedure
- Analyses and results
- Conclusion of Study 3 and main findings

Chapter 8: Conclusion
- Major research findings
- Theoretical implications
- Practical implications
- Limitation of this research

Figure 1.1: Structure of the thesis
Chapter 1 provides an overview of the thesis. It incorporates the research background, research gaps and questions, justification for the research and research methodology, research significance and research contributions. Chapter 2 provides a review of the literature, beginning with a review of the definitions of outsourcing and offshoring, OSPs, innovation and learning capabilities. It continues with a review of the role of customer characteristics in innovation performance, including the concepts of user-driven innovation and open innovation with customers. Chapter 3 presents the hypotheses that will be tested and analysed in the subsequent chapters. Chapter 4 describes the research design and methods used in this research.

Chapter 5 provides the method, analyses and results of Study 1. It begins by developing the hypotheses and conceptual framework, followed by an introduction of the data analysis technique and measurement. Second, the model estimations and results of the hypothesis testing are provided. Finally, the findings of the study are discussed, followed by a conclusion. Chapter 6 provides the method, analyses and results of Study 2. The chapter begins with hypotheses and model development. It then introduces PLS-SEM as an analytical method and outlines the advantages of using this technique. This is followed by the operationalisation of the constructs, model testing and evaluation of the results. Chapter 7 provides the method, analyses and results of Study 3. This chapter introduces qualitative comparative analysis (QCA), followed by the advantages of using the technique for this research. Next, the data calibration procedure is presented, followed by the data analyses and results. Finally, the findings of the study are discussed.

Chapter 8 presents the conclusions and implications of this research. The findings of the research are discussed, followed by the contributions of the research to both theory and practice, the limitations of the study, and ideas and avenues for future research. The chapter then presents the overall conclusions of the research.

1.7 Chapter Summary

This chapter provided a brief background of the research and outlined the significance and justification of conducting this research. It also introduced the research questions and identified the literature gaps. In addition, this chapter described the three studies conducted to fill the research gaps and address the research questions. It also outlined the research methodologies and the data analysis techniques used in this research.
Finally, the contributions of this study were highlighted, and the structure of the thesis was presented.
Chapter 2: Literature Review

2.1 Introduction

This chapter provides a review of the literature on offshore outsourcing of innovation, user-driven innovation and organisational learning. The first section focuses on OSPs and their unique position in the knowledge network. First, definitions of outsourcing and offshoring are reviewed, and the differences between the concepts are identified. This is followed by a review of organisational learning and the specific features of learning from customers. Literature on customer-driven innovation is then reviewed. Finally, a summary of the chapter is provided, along with the research questions derived from the literature review. Figure 2.1 presents the chapter map and the main streams of literature that will be reviewed in this chapter.

2.2 Concept of Outsourcing and Offshoring

In the late 1970s and early 1980s, companies started to realise efficiencies by shifting basic manufacturing to low-wage countries and simple services to outbound providers...
(Cohen & Zysman, 1988; Kujawa, 1981; Lipsey & Weiss, 1981; Root & Ahmed, 1979). To describe this phenomenon, several terms were introduced both in theory and practice, including contracting out, make or buy decisions, outsourcing and offshoring. These terms have remained the most often-used labels to represent external purchases of products and services (Norwood et al., 2006b).

The concepts of offshoring and outsourcing are sometimes confused (Bunyaratavej, Hahn, & Doh, 2007; Manning et al., 2008). Outsourcing describes the traditional form of contracting out work and is generally defined as having work that was previously performed inside the organisation performed by an external enterprise (Beaumont & Sohal, 2004). More specifically, outsourcing is the act of handing over all or part of a business activity or function to an external provider that takes control of special activities (Bailey, Masson, & Raeside, 2002; Tadelis, 2007). It is in the best interests of customer companies to ensure that their providers perform appropriately (Quinn, 2000). In this regard, a greater understanding of the performance of suppliers (providers) is key (Paliwoda et al., 2009) for client companies.

Given that there are different definitions of outsourcing and offshoring in the literature, it is useful to begin by reviewing some definitions used in the research. Quinn and Hilmer (1994, p. 46) defined outsourcing as the ‘external acquisition of activities, including those traditionally considered an integral part of any firm, provided that they do not form part of the firm’s core capabilities. In another study, Gilley and Rasheed (2000, p. 765) defined outsourcing as ‘the substitution of activities performed in-house by acquiring them externally although the firm has the necessary management and financial capabilities to develop them internally’. Although the definitions are different in some aspects, the literature review demonstrates that most scholars consider outsourcing the transfer of business activities to an external supplier or provider. Table 2.1 summarises the significant definitions of outsourcing from the literature.

Tadelis (2007, p. 264) stated that ‘offshoring is where a company outsources a business activity to a contractor in a foreign country. Offshoring may be a function of many decisions such as foreign labour costs, global strategy and even regulatory constraints’. Norwood et al. (2006a) defined it as the international relocation of product- and service-related activities and business functions to external contractors. That is, offshoring can be defined as the repositioning of the value chain undertakings of the firm to another country (Doh et al., 2009; Lewin et al., 2009; Manning et al., 2008).
Table 2.2: Definitions of outsourcing

<table>
<thead>
<tr>
<th>Authors (year)</th>
<th>Definition of outsourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lacity and Hirschheim (1993)</td>
<td>‘The purchase of goods or services that were previously provided internally’.</td>
</tr>
<tr>
<td>Quinn and Hilmer (1994)</td>
<td>External acquisition of non-core activities including those traditionally considered an integral part of any firm.</td>
</tr>
<tr>
<td>Ellram and Billington (2001)</td>
<td>‘The transfer of activities and processes previously conducted internally to an external party’.</td>
</tr>
<tr>
<td>Bailey, Masson and Raeside (2002)</td>
<td>The act of handing over all or part of an activity and related tasks to an external provider for the required outcome.</td>
</tr>
<tr>
<td>McCarthy and Anagnostou (2004)</td>
<td>A purchase of products and services that involves transferring the responsibilities for a business function and associated knowledge to a supplier.</td>
</tr>
<tr>
<td>Norwood et al. (2006a)</td>
<td>Represents external purchases of products and services.</td>
</tr>
<tr>
<td>Tadelis (2007)</td>
<td>The transfer of a business activity or function to an external supplier or provider that takes control of special activities.</td>
</tr>
<tr>
<td>Lahiri and Kedia (2011)</td>
<td>The relocation of tasks, processes or functions to outside companies.</td>
</tr>
</tbody>
</table>

Therefore, the term ‘outsourcing’ describes all activities that are contracted out, regardless of their geographic reach, scope or industry focus, while ‘offshoring’ refers to a subset of outsourcing strategies with respect to its geographical scope (Doh et al., 2009; Lewin et al., 2009; Manning et al., 2008; Tadelis, 2007). That is, offshoring can be defined as the repositioning of the value chain undertakings of the firm to another country (Doh et al., 2009; Lewin et al., 2009; Manning et al., 2008).

International outsourcing can also be referred to as offshore outsourcing because it involves the transfer of both the ownership and location of the operations (Hätönen & Eriksson, 2009)—in which client establishments choose to source their functions and processes that have been supported from inside their home country and international operations from outside—by using third-party service providers (Manning, Lewin, & Schuerch, 2011). Offshore outsourcing occurs when firms hand over their value chain
activities to foreign, independent service providers (Bunyaratavej, Hahn, & Doh, 2008; Doh, 2005; Doh et al., 2009; Lahiri et al., 2012).

In contrast, domestic outsourcing—also called onshore outsourcing—is the obtaining of services from a firm outside a company but within the same country (Lahiri & Kedia, 2011). Outsourcing arrangements can be either captive or external (i.e., include the setup of the firm’s own international sourcing facilities or working with foreign partner companies) (Plankenhorn, 2009). To summarise, Figure 2.2 presents the different modes of outsourcing and offshoring.

**Figure 2.3: Different modes of outsourcing and offshoring**

<table>
<thead>
<tr>
<th>Location</th>
<th>Onshore</th>
<th>Offshore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Captive</td>
<td>Captive offshoring</td>
</tr>
<tr>
<td></td>
<td>Domestic outsourcing</td>
<td>Offshore outsourcing</td>
</tr>
</tbody>
</table>

### 2.2.1 Outsourcing service providers

The term ‘OSPs’ refers to specialist supplier firms that offer services for clients who use such services (Lahiri & Kedia, 2009). OSPs are increasingly being recognised as important strategic partners of their clients because the success or failure of an OSP is intricately linked to the overall competitiveness of the client firm (Feeny et al., 2005). They are an integral part of the value chain of their clients (Paliwoda et al., 2009).

The term ‘client’ (customer) in this context refers to an organisation that buys the service from the provider (Paasi et al., 2014). According to organisational learning theory (Fiol & Lyles, 1985; García-García, García-Canal, & Guillén, 2017; Levitt & March, 1988; Whitaker, Mithas, & Krishnan, 2010), combining internal knowledge with a process of acquisition from external sources generates new knowledge. Thus, offshore outsourcing can involve a process of knowledge transfer from clients to
providers (Meneses et al., 2016); however, the nuances of different types of organisational learning are not central to the argument in this study. Rather, the focus of this research is on the fact that learning occurs in the process of service provision to customers.

In managing the provided services to clients, outsourcing service suppliers face a unique set of challenges. Service providers attempt to use their resources in the best possible way to meet the performance metrics agreed upon in the contract with their client (Kedia & Lahiri, 2007; Kotabe & Murray, 2001). One objective of a service provider is to add value to the efficiency of the client firm’s resources. To do so, suppliers of these services need to regularly monitor the needs and requirements of their current and potential clients. In addition, because outsourcing has significantly increased in recent years, it offers customer companies the opportunity to choose from a variety of full-service and specialist providers for explicit needs (Manning et al., 2011).

To reinforce their strategic position, OSPs can provide a range of services and combine their merits through joint ventures and partnerships (Currie, 2000). Identifying domain knowledge, communication and relationship management are also among the key issues for service providers to enhance their position (Hussey & Jenster, 2003).

Literature on the perspective of service providers is scarce and has focused on different aspects of these companies. Some scholars have analysed both the providers’ and clients’ viewpoints (Lahiri & Kedia, 2011; Lee & Choi, 2011; Manning et al., 2011), while others have considered the effect of trust (Lee & Choi, 2011; Mao et al., 2008), control (Manning et al., 2011; Mao et al., 2008), resources and partnership quality (Lahiri & Kedia, 2009), risks in outsourcing and offshoring partnerships (Aundhe & Mathew, 2009), branding (Meneses et al., 2016) and the organisational design and structure of offshoring service organisations (Chen & Lin, 2016).

Of relevance to this study and its focus on knowledge acquisition by service suppliers, the performance of service providers has been influenced by the effective management of people (Shee & Pathak, 2006) and the client relationship (Levina & Ross, 2003). Cooperation between a client and a provider can benefit both agents, and offshore outsourcing can be a source of competitive advantage for providers by enabling them to acquire valuable external knowledge (Chen, 2005; Jensen, 2009).
Di Gregorio, Musteen and Thomas (2009) studied the relationship between offshore service providers and small- and medium-sized enterprises (SMEs) in the context of offshore outsourcing projects. They found that it results in substantial learning and social network advantages that facilitate internationalisation efforts and international competitiveness of service providers. In another study, Lahiri and Kedia (2009) studied the effect of resources and partnership quality on providers’ performance. They focused on how offshore outsourcing providers’ assets (human capital, organisational capital and management capability) are considered valuable by clients and contribute to providers’ performance in offshore outsourcing relationships. Almeida and Meneses (2013) argued that service providers expect to acquire new skills through their offshore outsourcing relationships with their customers.

To achieve a better understanding of how service providers’ capabilities affect firms’ performance Cruz-Ros & Gonzalez-Cruz (2015), argued that offshore-outsourcing providers are potentially preparing to compete in the global market and specifically intend to incorporate outside knowledge in their in-house operations, which is harder to achieve at an arm’s length. Hence, customers become both a necessity and an opportunity for service providers. Meneses et al. (2016) analysed how offshore outsourcing providers can become direct competitors with former clients. They suggested that offshore outsourcing companies can take advantage of the knowledge that international customers possess, transform this knowledge into internal knowledge, explore the new knowledge and manufacture their own brand.

However, evidence suggests that the benefits obtained by OSPs from external sources may depend on service providers’ capabilities. Lahiri et al. (2012) examined the effect of management capability on the performance of offshoring service providers. The findings suggest that management capability positively moderates the relationship between partnership quality and firm performance. That is, while high management capability results in strong resource–performance relationships, low management capability results in relatively weaker associations.

The benefits also depend on the strength of the relationship with the client and the client’s involvement. Among previous studies that focused on the benefits of relationships between service providers and customers, Kedia and Lahiri (2007) developed a model that suggested three general types of offshore outsourcing partnerships: strategic, tactical and transformational. These three main partnerships...
vary in the degree of involvement with the provider and in the value proposition that the provider is confronted with by the customer company. Kedia and Lahiri (2007) emphasised that engaging and continuing in effective partnerships is not only a client-specific concern, but also poses important challenges for providers.

Similarly, Chadee et al. (2017) emphasised the importance of high-quality relationships with clients. They argued that collaborative innovation relationships between customers and service providers can contribute to the rapid growth of OSPs. Further, the ability to sustain innovations through close collaboration with customers enables OSPs to minimise the risk of failure and deliver innovative and customised business solutions to their clients, which leads to improved customer retention and benefits to attract new customers.

Table 2.2 presents an overview of the studies and mainly focuses on outsourcing and offshoring service providers. These studies suggest three key points. First, they identify the factors that drive outsourcing and offshoring. Second, they analyse the characteristics that facilitate outsourcing. Third, they suggest that firms can collaborate with their partners to develop experience (Dyer & Singh, 1998). As a result of such experience, firms can develop the capability to transfer knowledge from outside to their own company.

In the next section, the role of customers in the innovation performance of organisations will be reviewed.
<table>
<thead>
<tr>
<th>Author/s</th>
<th>Topic</th>
<th>Main area/perspective of the study</th>
<th>Theme of the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couto et al. (2008)</td>
<td>Examination of offshoring service providers (ORN Service Providers Survey Report)</td>
<td>Service providers (in the United States [US], Europe, India, China, Brazil and other countries)</td>
<td>General overview of providers</td>
</tr>
<tr>
<td>Mao et al. (2008)</td>
<td>Impact of service providers’ trust and clients’ control on the service providers’ performance</td>
<td>Service providers (Chinese IS service provider) and Japanese clients</td>
<td>Trust and control</td>
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<tr>
<td>Lahiri and Kedia (2009)</td>
<td>Impact of internal resources and partnership quality on the performance of offshoring providers</td>
<td>Service providers (Indian business process outsourcing providers)</td>
<td>Resources, partnership</td>
</tr>
<tr>
<td>Aundhe and Mathew (2009)</td>
<td>Risks in offshore IT outsourcing from the perspective of service providers</td>
<td>Service providers (IT service providers)</td>
<td>Risks</td>
</tr>
<tr>
<td>Lee and Choi (2011)</td>
<td>Bilateral perspective on the impact of trust in IT outsourcing</td>
<td>Service providers and clients</td>
<td>Trust in outsourcing relationship</td>
</tr>
<tr>
<td>Lahiri and Kedia (2011)</td>
<td>Co-evolution of institutional and organisational factors in explaining offshore outsourcing</td>
<td>Service providers and clients (Indian business process outsourcing providers)</td>
<td>Institutional and organisational factors in the relationship</td>
</tr>
<tr>
<td>Manning et al. (2011)</td>
<td>Role of relation specificity and client control on the stability of offshore outsourcing relationships</td>
<td>Service providers and clients (in the US, Europe, India, China and Latin America)</td>
<td>Relationship and control</td>
</tr>
<tr>
<td>Lahiri et al. (2012)</td>
<td>The impact of management capability on the performance of offshoring providers</td>
<td>Service providers (Indian business process outsourcing providers)</td>
<td>Management capability</td>
</tr>
<tr>
<td>Almeida and Meneses (2013)</td>
<td>Exploring providers’ expectations and acquiring new skills through the offshore-outsourcing relationships</td>
<td>Service providers (Portuguese offshore-outsourcing service providers)</td>
<td>Offshoring providers’ expectations</td>
</tr>
<tr>
<td>Jayaraman, Narayanan, Luo and Swaminathan (2013)</td>
<td>Offshoring business process services and governance control mechanisms</td>
<td>Business process OSPs in India</td>
<td>Governance control mechanisms in improving performance</td>
</tr>
<tr>
<td>Author/s</td>
<td>Topic</td>
<td>Main area/perspective of the study</td>
<td>Theme of the study</td>
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<tr>
<td>Chen and Lin (2016)</td>
<td>Global dispersion of offshore service providers: an information processing perspective</td>
<td>Offshore service providers (using data from international Offshoring Research Network (ORN) database including 12 countries)</td>
<td>Organisation structure and design</td>
</tr>
<tr>
<td>Meneses et al. (2016)</td>
<td>From offshore-provider to a brand creator</td>
<td>Offshore-outsourcing providers (12 Portuguese OSPs from the footwear sector)</td>
<td>Branding, partnership with clients</td>
</tr>
<tr>
<td>Chadee et al. (2017)</td>
<td>Leveraging resources for innovation and growth through collaborative value creation study of Indian OSPs</td>
<td>IT OSPs in India</td>
<td>Collaborative value creation, innovation</td>
</tr>
</tbody>
</table>
2.3 Customer Active Paradigm

Companies increasingly recognise that connected, informed and active consumers are a source of competence they must tap into to add value to their products (Prahalad & Krishnan, 2008; Prahalad & Ramaswamy, 2004b). Most research in innovation has focused on sources of innovation within the firm; however, more recently, attention has been paid to the role of customers. The key influence of the customer is an expansion of information bases that can be applied to enhance innovation—particularly information on solutions and applications that exist in the domain of the customers and users of a product or service (Piller & Ihl, 2009). Consumers can also act as a partner instead of an external element in innovation (Martinez, 2014).

Development of innovations increasingly involves two or more actors and often includes a customer and a supplier (Paasi et al., 2010). von Hippel’s research, which began in the 1970s, was the first to explicitly pay attention to the central role of users as innovators. After the early recognition that users can be sources of innovation, von Hippel (1978) developed an approach to innovation called the ‘customer-active paradigm’ (CAP), in which the customer advances a new idea and transfers it to an interested producer (de Jong & von Hippel, 2009). Urban and von Hippel (1988) argued that users in general and lead users in particular are sources of innovation.

In von Hippel’s (2007) study of the role of customers in the systematic innovation process, he showed that users rather than producers can be the major source of innovation and that innovation can take place in a distributed way. A distributed innovation system also entails that users share their innovations with other users and with producers (Harhoff, Henkel, & von Hippel, 2003). In fact, the key element in the customer-active perspective is empowered and connected customers who harness new developments to become more involved in, and exert greater control over, the company’s innovations (von Hippel, 2005).

Two key research approaches in the innovation management literature investigate user innovation (i.e., innovation with customers) (Urban & von Hippel, 1988; von Hippel, 2005) and open innovation (Chesbrough, 2003, 2006, 2011). In fact, recent trends in open-source movement, user-centred innovation, open innovation and collaborative
communities are based on von Hippel’s work on lead users and lead-user research (Vaisnoro & Petraite, 2012).

User-driven innovation is the process of tapping users’ knowledge to improve services and concepts and develop new products (Wise & Høgenhaven, 2008). Research has shown that identifying the most advanced users of a company and incorporating their knowledge and inputs into an innovation process has a positive effect on a firm’s innovation (Piller & Ihl, 2009; Piller, Ihl, & Vossen, 2010; Steiner, Tarman, Ihl, & Piller, 2009; von Hippel, 1990). Customers can take a more active role in a firm’s innovation process (Bogers, Afuah, & Bastian, 2010; Piller & Walcher, 2006), but not all customers are equally suited to contribute to this process (Fredberg & Piller, 2011). Further, empirical research has shown that users frequently play an important role in the development of new products and services (Lüthje & Herstatt, 2004), and users are more likely to innovate than producers if their expectations of innovation-related benefits are higher (Riggs & von Hippel, 1994).

The importance of customers, as one of the fundamental sources of information for innovation, is also discussed in the research stream of open innovation (Joshi & Sharma, 2004; Laursen & Salter, 2006; Piller & Ihl, 2009). The concept of open innovation focuses on internally developed and externally acquired resources (Alexiev, Tjemkes, Bahlmann, de Man, & Siamar, 2015). Open service innovation can enable service companies to identify service innovations by engaging with their external partners (Alexiev et al., 2015). Hence, companies are increasingly searching for external ideas and technologies to enhance their innovation, as well as external paths to commercialise their own ideas and technologies (Chesbrough, 2003).

Reviewing the literature, Belkahla and Triki (2011) focused on customer contribution in the innovation process from a knowledge management perspective. They suggested that innovation that is driven by customer knowledge requires a set of organisational competences and management skills from the company, as well as a mindset of customer knowledge acquisition, dissemination, transformation and use, to enhance the performance of new products and services. Moreover, some research has explored how users can be more active participants during innovation as co-producers of products, services or value in general (Buur & Matthews, 2008; Prahalad & Ramaswamy, 2003).
The importance of the customer in the innovation process can also be observed from the perspective of customer participation in the value creation process (Vaisnore & Petraite, 2011; von Hippel, 2007). This has also been examined in the research on user-driven innovation, which is defined as innovation that is generated or developed by users as a result of a collaborative process (Trott, Duin, & Hartmann, 2013; Vaisnore & Petraite, 2011). Service firms mostly rely on their real and probable customers for the co-creation of service innovations (Matthing, Sandén, & Edvardsson, 2004), which highlights the need to pay attention to the key role of users in service innovation.

Exposure to varied sources of knowledge boosts innovation adoption (Dewar & Dutton, 1986). In the context of OSPs, providing outsourcing services to customers helps OSPs to enhance the breadth of their knowledge base by connecting them to a variety of knowledge sources in their clients. However, it is more difficult to produce qualifications relating to services than to products. Services exhibit key characteristics such as intangibility, which means that the services cannot be touched. Perishability refers to the fact that companies normally cannot store excess services, and they cannot separate the production and consumption of service output (Parasuraman, Zeithaml, & Berry, 1985) as a result of a high degree of service specialisation (Aharoni & Aharoni, 1993).

It is more difficult for customers to compare specifications on an apples-for-apples basis and to verify that the supplier is delivering the specifications claimed. Customers must better explain what they need in terms of services, and their needs probably differ from one organisation to another. In turn, suppliers can no longer commit to long production runs and one-size-fits-all thinking to serve these customers. Instead, they must determine how to give customers what they need in a way that is beneficial to themselves (Chesbrough, 2010). Hence, customer involvement is a key to service innovation.

2.3.1 Customer involvement and innovation

Customer involvement in service innovation refers to the extent to which service providers interact with current and potential representatives of one or more customers at various stages of the new service development process (Alam, 2006; Matthing et al., 2004). It is similar to what some scholars call ‘customer interaction’ (Alam, 2006; Gruner & Homburg, 2000) and ‘customer partnerships’ (Campbell & Cooper, 1999).
Despite the difference in terminology, the concept of customer involvement provides valuable opportunities for firms to gain access to new and useful customer knowledge (Zhang, Lu, Wang, & Wu, 2015).

Customer involvement and collaboration with customers has been recognised as an important factor in successful new service development (Alam, 2006; Carbonell, Rodríguez-Escudero, & Pujari, 2009; Cooper, 2001; Greer & Lei, 2012). Underlying these views is the assumption that customers are sources of information and knowledge (Normann & Ramirez, 1998; Rothwell et al., 1974; Saldanha, Mithas, & Krishnan, 2017; Urban & von Hippel, 1988), and that customer involvement can enhance the effectiveness of the service and product concepts (Brown & Eisenhardt, 1995; Chang & Taylor, 2016; Cui & Wu, 2017). Customer involvement is built upon collaboration with customers in a process of mutual and iterative learning (Sinkula, 1994; Storey & Larbig, 2018). It has also been argued in the literature that customer involvement is the fundamental source of competitive advantages that add value to firms (Lengnick-Hall, 1996; Menguc, Auh, & Yannopoulos, 2014; von Hippel, 1998).

External partnerships with customers are essential to integrate and exploit external knowledge using different channels (West & Gallagher, 2006). It has been suggested that enhancing open service innovation within organisations, considering customers an essential part of the value network and collaborating with all stakeholders will help in developing new solutions (Chesbrough, 2011). Facilitating the necessary knowledge exchange and collaborative learning processes across the value network is essential to both effectively and efficiently co-innovate influences (Randhawa & Scerri, 2015). Moreover, customers who are more involved in the innovation process are more likely to contribute to service providers’ innovation performance of firms (Martinez, 2014). Customers’ ideas have been found to have a greater degree of novelty and clearer consumer benefits compared with ideas generated by firms’ professionals (Poetz & Schreier, 2012).

At the same time, as service providers seek more customer involvement, the role of the customer has changed from isolated to connected, from unaware to informed and from passive to active (Prahalad & Ramaswamy, 2004b). Therefore, companies might incorporate customers’ knowledge by shifting towards knowledge collaboration with their customers (Sawhney & Prandelli, 2000).
The degree of customer involvement has different effects on different types of service innovations (Alexiev et al., 2015). Customers can be active or passive in receiving services. Their incentives to actively be involved in the process include the hope of receiving a better service or product (Blazevic & Lievens, 2008). Active customers are involved in the service provision process, provide feedback about the services they receive, represent a useful source of information and, in some cases, deliver solutions for problem areas. In contrast, passive customers have a very low level of knowledge exchange and collaboration with service providers. This suggests that companies should encourage customers to be active users so companies can receive information about the perceptions of their current services, such as whether they need to improve existing services or develop new services (Blazevic & Lievens, 2008), which can trigger the development of new knowledge and insights.

2.3.2 Level of customer sophistication and innovation

As well as differing in their involvement, customers also vary in their level of knowledge of the service. Sophisticated users, so-called ‘lead users’ (von Hippel, 1986), are ‘those who are at the leading edge of each identified trend of related new product and service needs and also who expect to obtain a relatively high net benefit from solutions to those needs’ (Eisenberg, 2011). Such users are outside the firm experts in their area of business and hence might hold valued information about significant trends and events (Bengtsson & Ryzhkova, 2015). Identifying what sophisticated users are already doing and considering what the innovation means for the prospect of that business (Taylor, 2006) could therefore contribute to improved performance.

The lead-user perspective argues that users who have a high personal need for innovations and who are in a position ahead of an important trend are more likely to develop innovations of high value to others (Franke, von Hippel, & Schreier, 2006). Studies have also shown that the identification of lead users and use of their knowledge inputs has a positive effect on innovation performance (Piller & Ihl, 2009; Piller et al., 2010; Steiner et al., 2009; von Hippel, 1990). Lead users are a common source of innovations because they often anticipate needs that the larger marketplace has not yet identified and find ways to adapt existing products to address those needs (Thomke & von Hippel, 2002).
While lead users often provide key information about future trends and potential solutions, other customers may be more suited to evaluate innovative concepts or participate in the modification of a pattern (Piller & Ihl, 2009).

Lead users are particularly important in services because service innovations are usually not considered in firm development units (den Hertog, van der Aa, & de Jong, 2010). Instead, they are usually regarded by lead users (von Hippel, 1986), user firms (Oliveira & von Hippel, 2011) and knowledge-intensive business service firms (den Hertog, 2000) in a co-creative process (Witell, Kristensson, Gustafsson, & Löfgren, 2011). This highlights the need to pay attention to the key role of users in service innovation.

2.4 Insights from Service Innovation

Given that OSPs are one type of service-based firm, some insights might be drawn from the service innovation literature. The service sector includes a wide range of activities from consumer services (e.g., banks) to business services (e.g., information technology) and large-scale public sector services (e.g., education) (Randhawa & Scerri, 2015). Further, studies related to service innovation embed various ways of examining service innovation, such as user involvement in innovating services (Magnusson, Matthing, & Kristensson, 2003).

Agarwal and Selen (2011, p. 1172) defined service innovation as an ‘elevated service offering’ that is composed of ‘new client interface/customer encounter; new service delivery system; new organisational architecture or marketing proposition; and/or improvements in productivity and performance through human resource management’. Service innovation results when an organisation focuses its initiative to find an outcome that exceeds the customer’s expectation (Kandampully, 2002).

Adapting from Sampson and Froehle (2006), the process-based definition of service expresses the important role of customers in the service production process, in which customers provide the inputs rather than customers being the input to the service delivery process. In the resource-based definition, services are considered an application of competencies that use the knowledge and skills of all participants and take into consideration the notion of the supply chain and collaborators across both products and services (Vargo & Lusch, 2006). Co-produced services have customers
as an integral part of service delivery because they interact during the transaction. This allows the split of a front-stage and back-stage approach to a service at any point in the service provision process (Teboul, 2006). In contrast, a co-produced resource- and process-based definition of service is relevant to today’s service network environment through the concept of service providers (Agarwal & Selen, 2005).

According to Agarwal and Selen (2005), a service network is a network of value chains that combines the core competencies of stakeholders in the network, requires a strategic focus and revives roles and responsibilities among different members of the network. Through the use of relationships, as well as knowledge and process realignment and management, a service value network connects to the customer by heightening the transformation of the nature, content, context and scope of the service offerings. It also opens up new market opportunities and provides a competitive advantage. From a conceptual point of view, a service network is about creating and enhancing dynamic capabilities to foster a service innovation that can only result in collaborative functions of the service network participants (Agarwal & Selen, 2011). That is, a service network can provide opportunities to all members of the chain to combine their capabilities (Agarwal & Selen, 2005). Hence, customers and service providers as the key members of the service innovation network can use each other’s knowledge to refine their processes and improve their performance.

Service providers are the prime providers facing the customer, and the customer is the supplier of inputs into the service provider’s processes, making the service process bidirectional (Agarwal & Selen, 2011). Research indicates that many features distinguish the outsourcing of services from the outsourcing of manufacturing (Chadee & Mattsson, 1998). Services outsourcing involves a higher degree of interaction with customers, as an external contractor, compared with manufacturing outsourcing, thus providing more opportunities for fostering international competitiveness by gaining new knowledge (di Gregorio et al., 2009).

In addition, given the high specialisation of service outputs, non-manufacturing organisations are expected to rely more on relationship-building in their international activities compared with manufacturers (Westhead, Wright, Ucbasaran, & Martin, 2001). In particular, because of the distinctive characteristics of services relative to manufacturing (e.g., transferring services activities to a customer requires a greater
degree of human interaction), services outsourcing will be more likely to position OSPs to discern and pursue learning opportunities.

Further, innovation in services is different from innovation in manufacturing because services are considered in terms of intangibility, perishability, heterogeneity, synchronicity between consumption and production, and more customer interactivity (Sampson, 2001; Sampson & Froehle, 2007). The service innovation process encompasses a high degree of interactivity between the service provider and the customer (Wilson, Zeithaml, Bitner, & Gremler, 2016).

There are several perspectives and backgrounds in the discussion of service innovation (Agarwal, Selen, Roos, & Green, 2015). This section will focus on the concepts that are particularly relevant to the hypotheses of this research. The understanding of service innovation has evolved over different disciplines (Randhawa & Scerri, 2015). As such, the diverse emphases of these disciplines have led to various scopes of service innovation, such as user involvement and collaboration (Magnusson, 2003; Matthing et al., 2004).

The definition of service innovation presented by Sundbo (1997) in a classic article in the field has been summarised as ‘a new service or such a renewal of an existing service which is put into practice and which provides benefit to the organisation that has developed it’. Instead of considering service innovation the process of taking an idea into operation via prearranged improvement steps, the concept should be conceived to be more like a fuzzy process. Such a process can begin by observing a change in operations, or through an applied idea that is then developed further with practical experience (Toivonen & Tuominen, 2009).

Studies of product and service innovation can be counterparts to each other. The concepts of product and service innovations have mutual characteristics, but there are also qualities that differentiate them (Korhonen & Kaarela, 2015). Of particular importance is the emphasis on customer involvement in service development (Korhonen & Kaarela, 2015). Service firms ally with various parties to access knowledge (Theoharakis, Sajtos, & Hooley, 2009; van den Ende, 2003), including customers (Blazevic & Lievens, 2008), suppliers (van den Ende, Jaspers, & Gerwin, 2008) and competitors (e.g., Leiponen, 2005; Linnarsson, 2005). Among these groups of partners, customers are a distinctive type (Alexiev et al., 2015) because they can
provide a variety of novel ideas that firms can use to present services (Carbonell et al., 2009; Matthing et al., 2004).

Combining internal and external information sources provides a critical competitive advantage in service businesses. Interactions with partnering companies (including clients) allow entities to attain new knowledge, thereby allowing organisations to advance their competencies and build a higher level of capabilities (Agarwal & Selen, 2009; Gupta & Govindarajan, 2000). Value in service-based organisations is created through the integration of intangible resources and capabilities such as knowledge, competencies and customer collaboration (Agarwal & Selen, 2009; Agarwal, Selen, Sajib, & Scerri, 2014). Although customer participation, usually left to marketing scholars, has been brought to the attention of innovation scholars only recently (Vaisnore & Petraite, 2011), interorganisational cooperation and knowledge-sharing have been broadly discussed in the innovation and business strategy literature. The next section reviews some of the extensive research on organisational learning, followed by a review of organisational learning specifically in the context of outsourcing.

### 2.5 Innovation Performance

The literature has introduced an inclusive range of innovation types in organisations, including product, service/process, radical/incremental and technological/managerial. However, most empirical studies use the product–process typology (e.g., Delgado-Verde, Martín-de Castro, & Navas-López, 2011) to measure innovation performance (Liao, Fei, & Liu, 2008; Škerlavaj, Song, & Lee, 2010; Wang & Ahmed, 2004). Innovation performance can be considered the different types of development of services and processes to achieve an overall improvement in performance (e.g., Kmieciak, Michna, & Meczynska, 2012).

The measurement of innovation performance encompasses a general evaluation of all innovation efforts and outcomes. This goes beyond the sheer addition of profits generated by noble new products and services (Schepurek & Dulkeith, 2013). Measurement areas at the company level include inputs, the innovation process and outcomes, and they can also take into consideration contextual factors such as innovation strategy (Ochoa & Peña, 2012).
There is a positive relationship between organisational learning and innovation performance (Baker & Sinkula, 2007; García-Morales, Ruiz- Moreno, & Llorens-Montes, 2007). To develop innovations, firms can learn from their partners, customers and suppliers through their relationship (Chen, Lin, & Chang, 2009), and companies that involve both internal and external knowledge sourcing show more developed innovation performance than firms that depend on only one or the other (Cassiman & Veugelers, 2006).

### 2.6 Organisational Learning

According to Senge (1990), organisational learning includes generative learning, which requires an organisation to challenge its own assumptions, such as notions about its customers or competitors (Slater & Narver, 1998). If a company can examine its environment beyond its familiar assumptions, it may be able to discover new directions and new possibilities and thus create new innovative services (Matthing et al., 2004).

Fiol and Lyles (1985, p. 803) defined organisational learning as ‘the development of insights, knowledge, and associations between past actions, the effectiveness of those actions, and future actions’. Senge (1990) defined it as a continuous testing of experience and its transformation into knowledge available to the whole organisation, while Huber (1991) saw it as a combination of information acquisition, information distribution, information interpretation and organisational memory.

Organisational learning achieved through knowledge sharing (Lin & Wu, 2010; Otto, 2012) is critical to knowledge creation, which in turn drives innovation. Managing organisational knowledge is regarded as an important driving factor behind any type of innovation (Malerba, 2005; von Hippel, 1978). The highly interactive nature of service innovation requires different perspectives to manage the knowledge exchange and active learning processes (Randhawa & Scerri, 2015).

Through collaboration between customers and suppliers, which advances the process of organisational learning, organisations can present a variety of competitive activities to innovate services (Randhawa & Scerri, 2015). Organisational learning allows firms to not only create services and products earlier than their competitors, but also to create them before the recognition of explicit customer demand (Hamel & Prahalad, 1991; Slater, 2001). Hence, organisational learning is valuable to a firm and its customers.
because it supports the understanding and fulfilling of customers’ expressed and latent needs by providing new products, services and ways of doing business (Day, 1994; Sinkula, 1994).

Since combining internal knowledge with a process of acquisition from external sources can generate new knowledge (Inkpen, 2008), providing services to customers can lead to knowledge transfer from clients to OSPs. However, to transform external knowledge into service innovation, OSPs’ internal capabilities to foster a higher level of learning are required to facilitate this process.

Although it has been shown in previous studies that service providers can generate knowledge with a process of acquisition from their client companies, few studies have been conducted in the field of knowledge transfer from clients to providers. Moreover, although a review of the literature regarding OSPs suggests that outsourcing is related to both clients and providers and they can contribute to each other’s performance, the review shows that the combination of internal capabilities of OSPs along with external knowledge from customers has not been investigated previously in the literature.

However, there has been extensive research in the organisational learning literature on how organisations in general can better acquire knowledge, which is also relevant to OSPs. The key research question in the organisational learning literature relates to how organisations learn (Argyris & Schön, 1978; Dodgson, 1993; Feldman, 2000; Levitt & March, 1988). The ‘how’ describes the process and the process dynamics that firms face when they acquire and apply new learning (Jensen, 2009).

Argyris and Schön (1996) declared that organisational learning emerges when organisations gain information such as knowledge, understanding and procedures of any type and for different aims. This includes the interaction of individuals within and outside the organisation to exchange and jointly create knowledge (Fang, Lee, & Schilling, 2010). Organisational learning has also long been identified as a key resource and capability for firms to gain a competitive advantage under active environments (Chu, Li, & Lin, 2011). This is particularly relevant to OSPs given the highly dynamic conditions in which they operate.
2.6.1 Concepts of exploration and exploitation

A key question in the organisational literature relates to the type of learning that is best suited to different operating environments. Organisational learning theorists have generally distinguished between two types of learning. Exploitative learning is the acquisition of new capacities framed within existing insights, whereas explorative learning happens when organisations acquire capacities that differ profoundly from existing insights (March, 1991). Exploitation activities involve the use of existing knowledge, while exploration activities revolve around the search for new knowledge (Lavie, Stettner, & Tushman, 2010; Levinthal & March, 1993). Exploratory learning activities refer to learning from a variety of tools and marketplace information that are far beyond the current experiences of the firm (Chu et al., 2011). They typically focus on adding novel differences to the project’s repertoire, thereby increasing the possibility of finding potentially useful new solutions. Exploitative learning activities boost the advantages of exploratory learning by applying accumulated knowledge to assimilate new insights more efficiently (Chu et al., 2011).

Building on March’s (1991) pioneering article that distinguished between knowledge generation (exploration) and knowledge application (exploitation), the terms ‘exploration’ and ‘exploitation’ have increasingly come to dominate organisational analyses of technological innovation, organisation design, organisational adaptation, organisational learning and competitive advantage (Gupta, Smith, & Shalley, 2006). It has also been argued that the interaction between exploration and exploitation will have a positive effect on new product development (Katila & Ahuja, 2002).

The exploration–exploitation framework has broadly been used to represent a wide range of phenomena that encompass several displays of experience, as well as experimentation and diversity (Lavie et al., 2010). At the same time, the notion of exploration–exploitation has been studied in a variety of studies, such as organisational learning (Levinthal & March, 1993; March, 1991) and knowledge management (e.g., Brown & Duguid, 2001). It has also been extensively employed in the context of innovation (Danneels, 2002; Greve, 2007; He & Wong, 2004; Tushman, Smith, Wood, Westerman, & O’Reilly, 2003).

There are two main approaches in defining exploration and exploitation in the literature. The differences lie in whether the two should be conceptualised as two ends
of a continuum or as orthogonally distinct (Gupta et al., 2006). The latter approach happens when high levels of exploration or exploitation in one domain coexist with high levels of exploration or exploitation in the other domain. For the former, the interplay between the two occurs when exploration and exploitation compete for limited organisational resources and routines. This leads to organisational tension, which can only be resolved through the sequential execution of an exploration and exploitation strategy (Duncan, 1976). In such cases, logic dictates that exploration and exploitation should be viewed as two ends of a continuum (Gupta et al., 2006).

That is, when analysis involves action in multiple and connected domains, such as the coexistence of both exploration and exploitation as ambidexterity, these concepts are generally conceptualised as orthogonal, as high levels of exploration or exploitation in one domain may coexist with high levels of exploration or exploitation in the other domain. In contrast, when analysis is confined to a single domain, exploration and exploitation are usually conceptualised as two ends of a continuum (Gupta et al., 2006).

2.6.2 Concept of organisational ambidexterity

Despite the obvious differences between the two types of learning, many researchers and practitioners believe that a well-balanced combination of the two types of learning is necessary for a successful organisation (Levinthal & March, 1993; March, 1991).

Excessive exploration at the expense of exploitation can be costly, because the tangible outcomes of exploration will only be recognised in the future, and then only with uncertainty (Auh & Menguc, 2005). Further, exploration, to the exclusion of exploitation, results in numerous undeveloped ideas and not enough distinctive competency. Conversely, exploitation without exploration generates a ‘competency trap’ (March, 1991) in which a focus on exploitation without exploration prevents the firm from seeking learning and development. Therefore, some authors recommend a well-balanced combination of the two (Auh & Menguc, 2005).

Researchers have argued that the continuous arrangement of exploratory and exploitative activities can act as a source of sustainable competitive advantage (He & Wong, 2004; Jansen, van den Bosch, & Volberda, 2005; O’Reilly & Tushman, 2008). Thus, it is an important lens through which to interpret different outcomes within and
across organisations (Eisenhardt, Furr, & Bingham, 2010; Lavie et al., 2010) by qualifying an organisation to be innovative and effective without losing the benefits of efficiency to foster performance (Simsek, 2009).

Duncan (1976) was the first researcher to apply the concept of ambidexterity within the organisational domain. According to him, ambidextrous organisations succeed in handling conflicting needs. Duncan (1976) introduced the concept of organisational ambidexterity, referring to the organisational structures that help to simultaneously manage conflicting elements. If Duncan is broadly considered the father of organisational ambidexterity, key contributions to the concept came from Tushman and O’Reilly (1996), who referred to the multiple structures that a firm has to adopt to deal with the contradictory activities it experiences. In their study, Tushman and O’Reilly (1996) suggested that firms must achieve a balance between the two to attain higher performance, and exploration and exploitation can jointly influence organisational performance.

Starting from these initial definitions, the concept of ambidexterity has been extensively used to broadly refer to an organisation’s ability to perform differing and often competing strategic activities at the same time (Simsek, Heavey, Veiga, & Souder, 2009). The result of this expansion is that the dichotomy between exploration and exploitation constitutes one of the key topics analysed by another theoretical framework that has been concerned with understanding how organisations cope with contrasting and conflicting aims and how firms can reconcile differing tensions within organisational and interorganisational domains.

Ambidextrous organisations are capable of pursuing operational efficiencies to maintain profitability (exploitation) while adapting rapidly to environmental dynamics through discovery, searching, innovation and taking risks in new areas (exploration) (Duncan, 1976; Gibson & Birkinshaw, 2004; He & Wong, 2004; March, 1991; Raisch et al., 2009; Tushman & O’Reilly, 1996).

Ambidexterity has been classified according to three different views: behavioural, structural and realised. Behavioural or contextual ambidexterity was defined by Gibson and Birkinshaw (2004) as the organisation’s or business unit’s behavioural capacity to concurrently determine adaptability and alignment across the business unit, as the organisational context encourages and supports individuals in their efforts to
regard both of these concerns. In fact, the resulting type of contextual ambidexterity is observed as the behavioural capacity to concurrently determine alignment and adaptability (Carmeli & Halevi, 2009; Gibson & Birkinshaw, 2004; Güttel & Konlechner, 2009).

The second view, which is structural, refers to an organisational design or form containing not only separate structural subunits for exploration and exploitation, but also different competencies, systems, incentives, processes and cultures for each unit (Benner & Tushman, 2003). Organisations may resolve the tension between exploration and exploitation by separating them into different parts of the firm (Prange & Schlegelmilch, 2010). This structural separation between exploration and exploitation can be achieved by creating functions with a particular orientation. For instance, research and development (R&D) is more explorative-oriented, whereas production units typically focus on exploitation (Prange & Schlegelmilch, 2009). Hence, contextual ambidexterity differs from structural ambidexterity because it is a dual capacity embedded in the organisation at the individual level (Gibson & Birkinshaw, 2004; Prange & Schlegelmilch, 2009).

The realised view, which is more prevalent, defines ambidexterity with regard to the organisation’s exploitation and exploration achievements (Benner & Tushman, 2003; Smith & Tushman, 2005). Thus, what distinguishes this view from the first two is its explicit focus on the organisation’s actual exploration and exploitation performance.

Table 2.3 reviews the different conceptualisations of ambidexterity in the literature.

Birkinshaw and Gupta (2013) interpreted ambidexterity as a universal conceptual framework to frame research questions addressing the exploration–exploitation paradox. The need to balance exploration and exploitation was emphasised in their study. It is stated that scarce resources create a conflict between the two objectives, and firms need to balance resource allocation between their exploitation and exploration activities. Therefore, firms must achieve some form of ambidexterity to manage the tensions and contradictions between the two different learning activities. To do this, firms should have the capacity and managerial competence to transform the paradox into outputs that have the potential to create new value in the long run (Birkinshaw & Gupta, 2013).
To explore the nature of organisational ambidexterity and its performance implication, Junni, Sarala, Taras and Tarba (2013) examined the relationship between firm performance and exploration and exploitation. By conducting a meta-analysis of prior studies on ambidexterity and firm performance, they found that organisational ambidexterity is positively and significantly associated with firm performance. They further suggested that the effect of ambidexterity is stronger in the services sector than in manufacturing, which can be associated with the higher level of environmental dynamism in knowledge-intensive service firms (Junni et al., 2013).

More recently, Vahlne and Jonsson (2017) implies the approach to ambidexterity as the reconfiguration and change for exploration and exploitation respectively. They also argued on sequential ambidexterity where the organisation’s focus is on one of the competing objectives after another. Further, the organisation can allocate different tasks to different subsections, in which the simultaneous ambidexterity of the firm is implied, whereas the contextual type of ambidexterity is defined as that in which each member of the organisation can switch between the competing tasks of exploitation and exploration as the demand or opportunity arises.
Table 2.3: Definitions of ambidexterity

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>View</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>Lubatkin, Simsek, Ling and Veiga (2006)</td>
<td>Realised</td>
<td>Ambidextrous firms are ‘those who are capable of exploiting existing competencies as well as exploring new opportunities with equal dexterity’.</td>
</tr>
<tr>
<td>Cegarra-Navarro and Dewhurst (2007)</td>
<td>Behavioural</td>
<td>It is an organisation’s context to achieve alignment and adaptability simultaneously within organisational learning processes.</td>
</tr>
<tr>
<td>Sidhu et al. (2007)</td>
<td>Structural</td>
<td>Firms that are able to manage supply and spatial exploration with demand-side exploitation in fast-changing dynamic contexts.</td>
</tr>
<tr>
<td>Simsek (2009)</td>
<td>Realised</td>
<td>It is viewed as ‘an organisational-level construct that is applicable to a single business unit whose goal is to achieve high levels of both exploitation and exploration simultaneously’.</td>
</tr>
<tr>
<td>Carmeli and Halevi (2009)</td>
<td>Behavioural</td>
<td>‘It is the synchronous pursuit of both exploration and exploitation via loosely coupled and differentiated subunits or individuals, each of which specializes in either exploration or exploitation that has been conceptualized as critical for adaptation, viability, and success’.</td>
</tr>
<tr>
<td>Lin, McDonough, Lin and Lin (2013)</td>
<td>Realised</td>
<td>Balancing the coexistence of exploitation and exploration within the company.</td>
</tr>
<tr>
<td>Lin and McDonough (2014)</td>
<td>Realised</td>
<td>Ambidexterity is the ability to simultaneously engage in exploratory and exploitative activities that foster incremental innovation and radical innovation simultaneously.</td>
</tr>
<tr>
<td>Vahlne and Jonsson (2017)</td>
<td>Structural</td>
<td>Ambidexterity as a dynamic capability in which exploration/exploitation trace ambidexterity on the reconfiguration/change of coordination behaviours and operations, respectively.</td>
</tr>
</tbody>
</table>
In another study, Blindenbach-Driessen and van den Ende (2014) stressed the importance of developing new services and improving existing operational processes and routines for service firms to be competitive in the short term and to survive in the long term. Given the character of a service offering, there will be a larger intangible knowledge component that needs to be accounted for when developing new services (Atuahene-Gima, 1996; Sundbo, 1997), which can refer to the use of the service by customers and the delivery of the service by firm representatives (Blindenbach-Driessen & van den Ende, 2014).

2.6.2.1 Ambidexterity and innovation

The effects of explorative and exploitative innovation strategies on innovation intensity and sales growth were investigated by He and Wong (2004). The results of their study showed comparable positive effects of both exploration and exploitation on product innovation intensity, but only a positive effect of exploitation on process innovation intensity. This reflects short-term efficiency gains, while the interaction of explorative and exploitative innovation strategies yields no significant effects on innovation performance. The findings further suggest that the interaction of explorative and exploitative innovation strategies correlates positively with sales growth.

In another study, Atuahene-Gima (2005) confirmed that the interaction of exploiting existing competencies and renewing and exchanging them with new capabilities is positively related to innovation performance, while exploitation and exploration are believed to have direct and interactive effects on incremental and radical innovations. Further, Atuahene-Gima (2005) argued that although exploitation and exploration by themselves affect a firm’s innovation performance, their interrelationship provides an additional source of competitive advantage beyond those provided by each one individually.

Competitive and dynamic environments, with fast-changing demands in customer preferences, make current products and services obsolete more rapidly than in more stable environments and thus require faster and more frequent developments of new products (Jansen, van den Bosch, & Volberda, 2006).
According to Jansen et al. (2006), the sources of knowledge that are needed to generate innovation can be internal (i.e., from inside the organisation) or external (i.e., from outside the organisation). It is argued that exploratory innovations are designed to address the needs of new customers or emerging markets, while exploitative innovations require new knowledge or a departure from existing knowledge and the pursuit of new customer competencies. Hence, ambidextrous organisations are able to coordinate the development of exploratory and exploitative innovation in organisational units and are more likely to be successful because they create competitive advantages through exploratory and exploitative innovation.

In relation to improvements in current marketing strategies (exploitation) and the development of new knowledge and skills (exploration), Kyriakopoulos and Moorman (2004) examined whether the market orientation of a firm affects the degree to which project-level marketing exploitation and exploration strategies can operate in a complementary mode to increase the financial performance of new products. Informants were asked to rate the extent to which they improved their prior skills and procedures (exploitation) and challenged or changed their previous skills with respect to each of the different marketing areas, such as product distribution, product design, product quality and pricing. Using concepts from the organisational learning and capabilities literature, Kyriakopoulos and Moorman (2004) studied the project team’s reliance on new or current knowledge, skills and procedures to appraise marketing exploitation and exploration strategies.

Ambidextrous learning has been highlighted in previous studies as a key capability for innovative firms. Thus, this study argues that service providers with this capability can generate knowledge using a process of acquisition from their client companies, and they can foster their innovation performance.

2.7 Outsourcing Service Providers’ Learning and Innovation Performance

The aforementioned studies all suggest that the interrelationship between exploration and exploitation provides an additional source of competencies to the firm (Colbert, 2004). This implies that firms need to combine high exploitation with high exploration to achieve superior performance (e.g., Atuahene-Gima, 2005; Tushman & O’Reilly, 1996). However, a very small number of theoretically driven research studies have
been undertaken to investigate the effect of OSPs’ exploration/exploitation capabilities in improving their innovation performance.

Learning from clients is particularly important in the case of OSPs because their unique position in servicing many clients, often in different countries, facilitates the flow and generation of new knowledge by making use of what is already known and being open to absorbing new ideas and designs. The flow of knowledge from client organisations to OSPs can serve as an external source of knowledge that can be absorbed and used by service providers to enhance their innovation performance.

Through knowledge sharing with different partners (including customers), new products and service are developed (Gottfridsson, 2010; He & Wong, 2009; Smedlund, 2008; Taminiau, Smit, & de Lange, 2009). In particular, regular interactions between providers and client organisations generate opportunities to be exposed to each other’s knowledge (Perri & Andersson, 2014; Peteraf & Shanley, 1997) and allow more worthwhile information to be gained on how to use such knowledge (Kotabe, Martin, & Domoto, 2003). Further, working with clients and developing considered partnerships with suitable information involvement is an essential capability that OSPs require to perform better (Holzweber, Mattsson, Chadee, & Raman, 2012), and clients also expect that the services they outsource will improve over time (Feeny et al., 2005).

Since a transfer of knowledge occurs in the course of offshore outsourcing, providers can use this knowledge to develop their innovation performance. Providers expect to advance their learning skills and obtain new knowledge from the offshore-outsourcing relationship (Child & Rodrigues, 2005; Hult, Ketchen, & Slater, 2004; Jensen, 2009) that can support innovative approaches in return (Meneses et al., 2016). Additionally, because service providers deal with different firms in various organisational and national contexts, they are in a good position to take advantage of customers’ knowledge and acquire it inside their companies to develop the services they offer. However, as shown in other studies of service organisations, service providers need to possess learning capabilities to acquire knowledge from the offshore-outsourcing relationship (Hult et al., 2004; Jensen, 2009) and use that knowledge effectively in their organisation. This topic will be explored further in the remaining chapters.
2.8 Research Gaps and Questions

Reviewing the literature showed the importance of firms using ambidextrous learning capability combined with sophisticated and involved customers. Although the former is addressed by organisational learning theorists and the second is studied by user-driven and open innovation scholars, there is a lack of research that takes into consideration both theories together, which is a significant gap in the literature. Second, there is a need to examine the role of OSPs’ learning capabilities and customers’ characteristics in OSPs’ innovation performance.

Based on the above, the following research questions were derived:

- To what extent do learning capabilities of OSPs—in particular, ambidextrous learning—influence their innovation performance?
- Does interaction between OSPs’ learning capabilities and lead users influence OSPs’ innovation performance?
- Does interaction between OSPs’ learning capabilities and involved users influence OSPs’ innovation performance?
- Is there a difference between the projects with offshore and onshore customers?

2.9 Chapter Summary

This chapter critically reviewed the literature on the key research streams relevant to this research, including outsourcing and outsourcing service providers, innovation and service innovation, organisational learning and learning capabilities, and user-driven innovation and open innovation. This review found gaps in the literature and identified four research questions.

First, although the role of learning capabilities in innovation performance (e.g., Benner & Tushman, 2003; He & Wong, 2004; Raisch et al., 2009) and engaging customers in the creation of new products and services (e.g., Chesbrough, 2003; Prahalad & Ramaswamy, 2004a; Urban & von Hippel, 1988) has been widely investigated, the interaction between internal capabilities and external knowledge flow from customers remains largely under-researched. Specifically, in the context of OSPs, despite their unique position to benefit from access to knowledge residing in their global client
networks, there is still limited understanding of the extent to which internal capabilities and external knowledge flow from customers affects OSPs’ innovation performance.

Second, most research in outsourcing focuses almost exclusively on the client perspective and rarely considers the viewpoint of the service provider (Almeida & Meneses, 2013; Lahiri & Kedia, 2011; Lahiri et al., 2012; Manning et al., 2008; Meneses et al., 2016). A fact that stands out in the review of the literature in the context of OSPs is that most of the published research neglects the dimension of providers (Aundhe & Mathew, 2009; Lahiri & Kedia, 2009; Lahiri et al., 2012; Mao et al., 2008).

Third, despite the importance of OSPs in international business literature, there has been a lack of research regarding the investigation of enhancing innovativeness in such companies. Therefore, this thesis seeks to address this gap in the literature and expand the understanding of knowledge acquisition in the context of OSPs.

Fourth, both internal capabilities and being open to knowledge sharing are important for upgrading innovative performance (Caloghirou, Kastelli, & Tsakanikas, 2004). Hence, this chapter sought to demonstrate the main internal and external factors that contribute to the development of OSPs’ innovation performance.
Chapter 3: Hypotheses Development

3.1 Introduction

The literature review identified four key research questions:

1. To what extent do learning capabilities of OSPs—in particular, ambidextrous learning—influence their innovation performance?
2. Does interaction between OSPs’ learning capabilities and lead users influence OSPs’ innovation performance?
3. Does interaction between OSPs’ learning capabilities and involved users influence OSPs’ innovation performance?
4. Is there a difference between the projects with offshore and onshore customers?

In this chapter, specific hypotheses that aim to answer these questions are developed.

3.2 Hypotheses

3.2.1 Learning capabilities of outsourcing service providers

As discussed in the literature review, it has been proposed that two types of capabilities underlying a firm’s innovation are exploration and exploitation (Fang et al., 2010; Liao et al., 2008; March, 1991). They can be regarded as two distinct dimensions of learning behaviour that exist simultaneously (Bierly, Damanpour, & Santoro, 2009; Gibson & Birkinshaw, 2004; He & Wong, 2004; Mom, van den Bosch, & Volberda, 2007; Raisch & Birkinshaw, 2008). Both are important for service firms to be competitive in the short run and to survive in the long run (Blindenbach-Driessen & van den Ende, 2014). Exploration refers to developing new services, whereas exploitation refers to improving existing operational processes and routines (Blindenbach-Driessen & van den Ende, 2014). Further, because of the less tangible character of a service offering, there will be a larger intangible knowledge component that needs to be accounted for when developing new services (Atuahene-Gima, 1996; de Brentani, 1995; Sundbo, 1997). This knowledge component can refer to the use of the service by customers and the delivery of the service by firm representatives (Blindenbach-Driessen & van den Ende, 2014).
For OSPs, in particular, they are expected to acquire new skills through their offshore-outsourcing relationships (Almeida & Meneses, 2013). Learning capabilities can help OSPs to accumulate knowledge and create more value (Jensen, 2009). It has been argued that offshore-outsourcing providers specifically aim to include outside knowledge in their in-house operations, which is more difficult to achieve at an arm’s length (Nonaka et al., 1994). This thesis argues that to transform new knowledge into innovative outcomes, OSPs require learning capabilities that can foster a higher level of innovativeness in their company.

In the following sections, different learning capabilities of OSPs are discussed, including exploration, exploitation capabilities and their effect on fostering innovation performance.

3.2.1.1 Exploration capability and innovation performance

Exploration is demonstrated as experimentation with new alternatives, and it is associated with variation, search, discovery and innovation (Levinthal & March, 1993) in the hope of finding new alternatives that are superior to obsolete practices (Rothaermel & Deeds, 2004). Previous studies have shown that there is a positive relationship between a shared organisational context and exploration insofar as the organisation’s mission advocates ongoing innovation that can encourage wider exploration for new knowledge and ideas (Lavie et al., 2010; Sidhu, Volberda, & Commandeur, 2004). Moreover, exploratory learning could affect the introduction of new products and services (Chu et al., 2011; Katila & Ahuja, 2002).

OSPs are often employed by clients to add value to the efficiency of their firms’ resources, and they require the ability to be innovative in presenting new generations of services and evaluating diverse options with respect to services and processes. Hence, I argue that OSPs with a highly developed exploration capability are likely to generate new services. I hypothesise that:

Hypothesis 1: Degree of exploration capability of OSPs positively affects its innovation performance.
3.2.1.2 Exploitation capability and innovation performance

Exploitation is defined as the modification and extension of existing competencies and the elaboration of established ideas (Lewin, Long, & Carroll, 1999; March, 1991). As suggested by the literature, the objective of exploitation is to respond to current environmental needs, and it involves bottom-up learning (Laureiro-Martínez, Brusoni, Canessa, & Zollo, 2015). A capability for exploitation learning, which is associated with systematic reasoning and measuring performance (Lewin et al., 1999), can help OSPs to refine and implement established ideas, services and technologies, and to enhance efficiency. Moreover, OSPs generally provide services that can be refined and improved constantly over time. Therefore, I argue that having exploitation capabilities can help OSPs to acquire knowledge, enhance existing activities and drive their innovativeness.

In addition, an exploitation capability assists in enhancing a firm’s innovativeness because it introduces distinctiveness and modification to existing routines (He & Wong, 2004; Li, 2013). To enhance innovativeness, an OSP’s orientation needs to be towards the introduction of new services that are improved versions of existing ones, the provision of higher-quality services or increased efficiency of current processes and routines in service provision (i.e., exploitation). Accordingly, I hypothesise that:

Hypothesis 2: Degree of exploitation capability of OSPs positively affects its innovation performance.

3.2.1.3 Outsourcing service providers’ ambidexterity capability

As stated previously, although exploration and exploitation are often conceptualised as opposing types of learning by some researchers, others have argued that organisations can pursue both simultaneously in ambidextrous learning (Beckman, 2006; Gibson & Birkinshaw, 2004; He & Wong, 2004; Jansen et al., 2006; Lavie & Rosenkopf, 2006; Lubatkin et al., 2006; Raisch & Birkinshaw, 2008). Coordination and integration of exploratory and exploitative efforts across organisational units are essential in achieving ambidexterity (Gilbert, 2006; Smith & Tushman, 2005; Tushman & O’Reilly, 1996). Therefore, exploitation or exploration by themselves are inadequate to support companies competing in a hypercompetitive and dynamic environment (Kristal, Huang, & Roth, 2010).
A focus on exploitation without exploration prevents an organisation from investigating and developing new products and services. In fact, the focus on exploration without exploitative activities put firms at risk of having too many underdeveloped ideas and not enough distinctive competence. Therefore, scholars suggest that firms aim to achieve a well-balanced combination of exploration and exploitation (Auh & Menguc, 2005) to be innovative, flexible and effective without losing the benefits of stability, usage and efficiency (March, 1991). Both exploration and exploitation are related to learning and innovation, albeit of different types, and the two can be conceptualised as being orthogonal (Benner & Tushman, 2003; He & Wong, 2004).

Exploitation and exploration are considered categorically distinct, yet complementary (Levinthal & March, 1993). Following Bierly and Daly (2007), Katila and Ahuja (2002), He and Wong (2004) and Mom et al. (2007), this study also regards exploration and exploitation as two distinct dimensions of learning behaviour rather than as two ends of a unidimensional scale. It also views them as having simultaneous existence (Gibson & Birkinshaw, 2004; He & Wong, 2004; Raisch & Birkinshaw, 2008), whereby exploitation and exploration can co-exist in harmony within an organisational unit. This view is in line with Simsek’s (2009) view of ambidexterity, whereby ambidexterity is defined as achieving high levels of both exploitation and exploration simultaneously.

Research has shown that ambidextrous firms are capable of exploiting existing competencies and exploring new opportunities (Floyd & Lane, 2000). Ambidextrous learning has also been highlighted as a key capability for innovative firms in many studies (e.g., Fang et al., 2010; Gibson & Birkinshaw, 2004; He & Wong, 2004; Liao et al., 2008). Drawing upon the theoretical lenses of organisational learning, this study defines ambidextrous service providers as OSPs that simultaneously pursue a high level of both exploitative and explorative activities. Exploitative activities in service providers include the set of practices that refine and extend existing processes and resources. In contrast, exploration pertains to practices that improve new competencies by experimentation and gaining new knowledge and resources (Kristal et al., 2010).

OSPs are primarily knowledge-producing firms working with different types of customers. Thus, ambidexterity is likely to affect the innovation performance of OSPs.
Namely, service providers with superior ambidexterity may experience higher innovation performance. Based on the above, I hypothesise that:

*Hypothesis 3: The level of ambidextrous learning capabilities of OSPs is positively related to their innovation performance.*

### 3.2.2 Customer characteristics

In addition to developing knowledge internally, another key source of innovation is customer knowledge. Access to knowledge from various clients is an important source of external learning (Lin & McDonough, 2014; Phene & Almeida, 2008) and helps OSPs to gain new knowledge that can be used to facilitate their innovation.

Research on business services has suggested that one of the keys to successful value creation is the knowledge gained from customers and wider industry networks (Moeller, Ciuchita, Mahr, Odekerken-Schröder, & Fassnacht, 2013). Previous studies have shown that some service firms use alliances with various parties to access knowledge (Theoharakis et al., 2009; van den Ende, 2003), such as customers (Blazevic & Lievens, 2008), suppliers (van de Vrande, de Jong, Vanhaverbeke, & de Rochemont, 2009) and competitors (e.g., Leiponen, 2005; Linnarson, 2005).

Consumers can act as partners instead of as external elements in innovation (Martínez, 2014). As such, participation involves customer engagement in the creation of offerings through ideation and development (Bolton & Saxena-Iyer, 2009; Heinonen et al., 2013). In particular, working with clients and gaining access to various sources of knowledge are essential abilities that OSPs require to perform better (Holzweber et al., 2012). At the same time, clients expect that the services they outsource will improve over time and provide them with some combination of cost, quality and functionality improvements (Feeny et al., 2005).

This study suggests that because of the specific role of OSPs, in which they frequently interact with customers, they are much more likely to be exposed to a wide range of customers’ knowledge sources. Thus, I argue that working with outsourcing clients exposes OSPs to clients’ knowledge, which in turn allows OSPs with the appropriate learning capability to acquire this new knowledge to improve their services, routines and processes. Further, I argue that the role of different customers in innovation processes might vary depending on (1) their levels of involvement in innovation
processes, (2) whether or not they are lead users and (3) whether they are domestic customers or located offshore. Thus, in the subsequent sections, the role of different types of customers in OSPs’ innovation performance is discussed.

3.2.2.1 Customer involvement

Customer involvement refers to the extent to which a customer is involved in a service production process and interacts with a firm at various stages of the new service development process (Alam, 2006; Chase, 1981; Matthing et al., 2004; Zhang et al., 2015). It has been defined as the extent to which service producers relate with existing or potential representatives of one or more clients at different stages of the new service development process (Alam, 2006; Carbonell et al., 2009; Matthing et al., 2004). By using knowledge for innovation perspective, customer involvement and participation can be analysed while using value creation or innovation inputs in an innovation process (Vaisnore & Petraite, 2011). Customer involvement has long been considered important for successful product and service development (Alam, 2006; Cooper, 2001), and it can influence service innovation (Kristensson, Matthing, & Johansson, 2008; Matthing et al., 2004). However, customer involvement influences service innovation to varying degrees (Alexiev et al., 2015). Customers can be either active or passive in receiving services. Active customers hope their information will help the company serve them better; as a result of being active informers, customers benefit from improved products and services (Blazevic & Lievens, 2008). Customers may play a role as active users in the service provision process and they may provide feedback about the services they receive or be a useful source of information and even deliver solutions for problems areas. In contrast, with passive users, there is a very low level of knowledge exchange and collaboration with service providers. Accordingly, I hypothesise:

Hypothesis 4: Highly involved customers have a positive effect on the innovation performance of OSPs compared with less sophisticated customers.

3.2.2.2 Customer sophistication

As discussed earlier, previous studies have found that sophisticated customers, or lead users, will modify services and products or use them in unforeseen ways to meet their needs, and their needs and preferences can lead other customers (Eisenberg, 2011).
Cooperating with lead users has been described as an important source of innovation for firms (von Hippel, 2005). Therefore, this study argues that superior innovation performance by OSPs requires incorporating the knowledge of lead users, who are a source of innovation.

Innovation research has identified that lead users can have a more significant effect on firms’ innovation (von Hippel, 1986). Especially in fast-paced markets, cooperating with lead users has been described as an important source of innovation for firms (von Hippel, 2005), and it is more advantageous to involve these customers in the innovation process (Bessant & Tidd, 2007).

The lead-user perspective sees a distributed innovation process in which the sources vary greatly and in which users play a very important, but overlooked, role (Trott et al., 2013). Hence, lead users who modify OSPs’ services or use them in unforeseen ways to meet their needs (Eisenberg, 2011) may be a better source for absorbing new knowledge and motivating innovativeness within OSPs. Accordingly, I hypothesise:

Hypothesis 5: Highly sophisticated customers have a positive effect on the innovation performance of OSPs compared with less sophisticated customers.

3.2.2.3 Customer location (domestic v. offshore)

OSP s usually have two main groups of customers: domestic and offshore customers. Gaining access to various sources of knowledge is an essential capability that OSPs require to perform better (Holzweber et al., 2012). Studies also suggest that knowledge from distant sources is applied more in new knowledge exploration (Bierly et al., 2009). OSPs with offshore customers are more likely to be exposed to a wide range of knowledge sources. Those who offer services to offshore customers can also exploit knowledge from their customers and use it to improve existing services, and they could reapply it in connection with other customers and enhance their own innovation performance. Of these, offshore customers are more likely to contribute to innovativeness. Liao et al. (2008) highlighted that the main source of knowledge to providers relies on the transference of know-how on product and service design and development from international clients. Acquiring knowledge from different sources is the key to innovation (Bertrand & Mol, 2013). Therefore, OSPs with offshore customers are more likely to be exposed to a wide range of knowledge sources that are
not available within their home country, and they may exploit the knowledge sources in their firms or reapply them in different contexts, leading to new or improved services.

Hence, I propose that offshore clients could be a better source of new knowledge and motivating innovativeness within OSPs. I hypothesize that:

*Hypothesis 6: Offshore customers have a greater effect on the innovation performance of OSPs compared with domestic customers.*

### 3.2.3 Moderating roles of customer characteristics on learning capabilities

Based on previous studies of ambidextrous learning in innovation, this study argues that to take advantage of clients’ knowledge, OSPs need to have ambidextrous learning capabilities to assimilate external knowledge and combine it with existing knowledge to improve their services and processes.

Although the role of ambidextrous learning in innovation has been established in many studies, evidence from the industry has increasingly suggested that many ambidextrous firms fail to deliver innovation to remain competitive in the fast-changing market, implying that innovation requires more than just internal learning capability. In this study, I propose that the characteristics of customers who are external sources of knowledge for OSPs play a crucial role in the relationship between OSPs’ ambidexterity and their innovation performance.

Both OSPs and their clients are more likely to meet their own performance purposes by collaborating with each other in the design and delivery of custom-built services (Chadee et al., 2017). Highly innovative companies often work closely with their customers to uncover needs and wants that can be translated into new or improved product or service offerings (Eisenberg, 2011). Internal capabilities of the firm and openness towards knowledge sharing are both essential for advancing innovative performance (Caloghirou et al., 2004). The main contribution of customers is an enlargement and enrichment of information bases that can be used for the innovation process (Piller & Ihl, 2009) of OSPs.

In this study, I identify and focus on the two key aspects of customer characteristics: degree of involvement and level of sophistication. A high level of involvement and
sophistication represents an active lead user, while a low level of involvement and sophistication signifies a passive, average customer.

3.2.3.1 Active v. passive users and ambidexterity

As discussed in the literature review, studies have shown that the identification of advanced users and the use of their knowledge inputs have a positive effect on firms’ innovation performance (Piller & Ihl, 2009; Piller et al., 2010; Steiner et al., 2009; von Hippel, 1990).

Customer participation in the innovation process and customer-driven innovation requires both organisational competencies and a mindset of customer knowledge acquisition to increase innovation performance (Belkahla & Triki, 2011).

OSPs are predominantly knowledge-producing firms working with different types of customers to provide specialised services to them (Chadee et al., 2011). Further, empirical research has shown that users frequently play an important role in the development of new products and services (Lüthje & Herstatt, 2004), and customers are more likely than producers to innovate if their expectations of innovation-related benefits are higher (Riggs & von Hippel, 1994). Users can be more active participants in innovation as co-producers of products and collaborate with service providers in a process of mutual and iterative learning (Sinkula, 1994). In service industries, whereby customers actively participate in the value creation process, achieving a higher competitive advantage is associated with using a combination of internal and external knowledge sources (Menon & Pfeffer, 2003). Thus, I argue that interaction with their active (highly involved) customers leads to a stronger effect of ambidexterity on OSPs’ innovation performance. I hypothesise that:

_Hypothesis 7: Customer involvement positively moderates the relationship between ambidexterity and the innovation performance of OSPs._

3.2.3.2 Lead v. average users and ambidexterity

Lead users as a source of innovation (Thomke & von Hippel, 2002) is also a well-established research stream in innovation research, and involving them in new product and service development has been shown to be beneficial to a company’s innovation performance (Wecht & Baloh, 2006).
Highly sophisticated customers (lead users) who have a high personal need for innovation and who are in a position ahead of an important trend are more likely to develop innovations of high value (Franke, von Hippel, & Schreier, 2006). These customers are both well qualified and motivated to make significant contributions to the development of new products and services (von Hippel, 1986).

Given their characteristics, lead users are likely to contribute to the knowledge acquisition of service providers. They also act as a source of new knowledge to facilitate and enhance service providers’ innovativeness and competence exploration (Atuahene-Gima, 2005; Piller & Walcher, 2006).

The degree of customer sophistication contributes to strengthening the relationship between OSPs’ ambidexterity capability and innovation performance. Accordingly, I argue for a moderating effect of customer sophistication because it facilitates knowledge exchange between service providers and their clients. Therefore, it is expected that ambidextrous service providers will benefit from interaction with their lead customers, because these customers provide a large base of knowledge and information about needs, applications and solutions (Vaisnore & Petraite, 2011). By building on the previous arguments, I contend that the effect of ambidexterity on innovation performance is influenced by the degree of customer sophistication. In particular, lead users can strengthen the hypothesised relationship between ambidexterity and innovation performance as a result of a greater level of external collaboration that favours the internalisation of knowledge from user involvement. Hence, I hypothesise that:

*Hypothesis 8: Customer sophistication positively moderates the relationship between ambidexterity and the innovation performance of OSPs.*

Table 4.1 summarises the hypotheses proposed this research. In the next two chapters, the aforementioned hypotheses will be tested, and the results will be analysed.
### Table 4.4: Hypotheses testing

<table>
<thead>
<tr>
<th>Variables</th>
<th>Hypotheses</th>
<th>Composed/components of variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct effect on innovation</td>
<td>• Exploration capability</td>
<td>H1 Ambidexterity (higher-order construct of the components)</td>
</tr>
<tr>
<td></td>
<td>• Exploitation capability</td>
<td>H2 Ambidexterity (multiplicative of the components)</td>
</tr>
<tr>
<td></td>
<td>• Customer involvement</td>
<td>H3</td>
</tr>
<tr>
<td></td>
<td>• Customer sophistication</td>
<td>H4 Active–passive users (highly involved v. less involved)</td>
</tr>
<tr>
<td></td>
<td>• Customer location</td>
<td>H5 Lead–average users (highly sophisticated v. less sophisticated)</td>
</tr>
<tr>
<td></td>
<td>• Customer involvement × exploration capability × exploitation capability</td>
<td>H6 Offshore–onshore users</td>
</tr>
<tr>
<td>Interaction effects on</td>
<td>• Customer sophistication × exploration</td>
<td>H7 Ambidexterity and active users</td>
</tr>
<tr>
<td></td>
<td>• Capability × exploitation capability</td>
<td>H8 Ambidexterity and lead users</td>
</tr>
</tbody>
</table>
4.1 Introduction

This chapter details the research design and methodologies applied to this research to translate the objectives of this research into concrete findings. The purpose of the research and the basic research perspective are outlined first, followed by the research strategy, which uses a mixed method approach. This is followed by a description of the data collection instrument, the process for developing the survey instrument and a description of the sample. Next, the data preparation process is explained, along with a summary of the data analysis techniques that were used. Finally, the ethical implications of the research are provided, followed by a summary of the chapter.

4.2 Research Strategy

Research strategies can be broadly categorised into three groups: quantitative, qualitative and mixed method research (Creswell, Plano Clark, Gutmann, & Hanson, 2003; DeCuir-Gunby, 2008). *Quantitative research* is typically directed at theory verification (deductive inquiries). These investigations, which are usually highly data-intensive, allow statistical evaluations to test hypotheses. A typical drawback of usually closed-ended questions in broad surveys is that more in-depth information is not raised, and the researcher’s conceptualisation may deviate from the participants’ understanding. However, these deviations typically remain unnoticed. Hence, difficult or complex questions or emerging constructs are less suited to be included in the analysis.

In comparison, *qualitative research* is useful to explore concepts or generate theory (inductive inquiries). Complex or emerging research topics are usually addressed via the qualitative research design. However, qualitative methods can be too subjective, which means that the findings of the research are highly reliant upon the usually unsystematic views of the researcher. Second, qualitative methods suffer from greater difficulty in replicating the study, which makes assessing the reliability of a study more challenging. Third, qualitative methods are lacking with regard to generalisability (Yin, 2015), which means the findings of a study are hardly representative of the broader population or other similar research settings or situations. Fourth, qualitative
Multiple methods research is the type of research in which researchers draw on data from more than one source and apply more than one type of analysis (Creswell & Plano Clark, 2007; Johnson & Onwuegbuzie, 2004). Thus, multiple methods studies may employ two or more qualitative methods, two or more quantitative methods or a combination of qualitative and quantitative methods in what is called a mixed methods approach. Depending on the actual study design, it can be used to generate a theory, test a theory or both. Therefore, a combination of approaches is best for answering complex research questions (Creswell, 1999) and can permit the confirmation of findings of the research using different techniques. It can also be used to expand an understanding from one method to another (Creswell et al., 2003).

According to Tashakkori and Teddlie (1998), using one study to inform a subsequent study describes one of the research aims of mixed methods research, in which different methods are implemented sequentially to develop the findings from the previous one. The researcher’s intent is to use the results obtained from the first method to inform a subsequent study, thereby expanding the insights generated by the research problem. Results are reported separately for each phase of the study, followed by a general discussion that ties them together by comparing and contrasting the findings (Davis, Golicic, & Boerstler, 2011). The benefits of employing a mixed methods research design include the ability to enhance the dimension and scope of the study and generate greater robustness in the findings of the research (Stewart, 2009).

### 4.3 Research Design

In this thesis, a three-study mixed methods research design was employed to address the research questions. In the first two studies, the research seeks to examine the relationships between variables in a posited conceptual model that was derived from a critical review of the literature. Therefore, these studies adopt a deductive approach (McGrath & Johnson, 2003) to establish that the hypothesised relationships in the theoretical model are as posited (Ponterotto, 2005). A deductive approach generally involves a quantitative research method to analyse the data statistically (i.e., the hypothetico-deductive method) (Deshpande, 1983; Ponterotto, 2005).
In the first study, the proposed relationships between variables are tested using ordinary least squares (OLS) regression. The data analysis technique used in the second study is structural equation modelling (SEM), which is able to analyse multiple variables simultaneously (Fornell, 1985; Lim & Ling, 2011). In particular, these two studies involve the use of a worldwide self-administered survey completed by a sample of OSPs, featuring quantitative measures and data analysis using statistical techniques.

The aim of the third study of this thesis is to investigate the effect and interplay of different types of OSPs’ learning capabilities and their customers’ characteristics in innovation performance. As there is no existing theory about this in the literature, a retroductive approach (Downward & Mearman, 2006; Ragin & Amoroso, 1994; Sæther, 1998; Teddlie & Tashakkori, 2003) is followed, which combines elements from the deductive research approach to test a theory and an inductive research approach that aims to build a theory (Ponterotto, 2005).

One of the main benefits of a retroductive approach is that the dualism between pure inductive and deductive research processes can be overcome by implementing it. Further, retroduction makes possible a research process that is characterised by the linking of evidence (induction) and social theory (deduction) (Sæther, 1998).

Retroduction represents an attempt to overcome the pitfalls of purely inductive or deductive research processes. One key issue with the inductive method is the notion that data can be decoupled from theory. Induction assumes that data exist that are not theory laden (Alvesson & Sköldberg, 1994). In contrast, deduction implies that theories without facts are possible.

Ragin (1994) further developed retroduction into a model for social science research. According to him, social research involves a dialogue between ideas and evidence. Ideas aid social researchers’ use of evidence to extend, revise and test ideas. For social scientists, social theory is a major source of ideas and a source that is drawn on when conducting research. Evidence is termed ‘data’, but evidence is far from restricted to survey data. In fact, almost all facets and features of social life are, at least potentially, ‘data’ to a social scientist. To describe retroductive research, Ragin, Mayer and Drass (1984) highlighted the interplay of theory and data as a central process in empirical research. The general procedure of retroductive research is presented in Figure 3.1.
Following a retroductive approach, Ragin’s QCA method is used in Study 3 to identify organisational configurations that lead to high innovation performance. QCA is an instrument of generic analytical approaches that qualitative methodologists advocate (Miles & Huberman, 2003), and it is an approach favoured by researchers who want to find a balance between case- and variable-oriented analysis (de Meur, Rihoux, & Yamasaki, 2002).

The subsequent sections discuss the data collection instrument, the survey instrument development procedure, the operationalisation of constructs, the sample population and the sample size.

### 4.4 Data Collection Instrument

Data collection methods for cross-sectional designs can involve a self-administered questionnaire or a structured interview (Bryman, 2006). Self-administered questionnaires are completed by respondents by post, email, online or in person (Zikmund, Babin, Carr, & Griffin, 2013). This method has some advantages over interviews, such as being cheaper, quicker and more convenient, and the researcher does not have an effect on responses by respondents. However, researchers cannot collect any additional data once the questionnaire has been distributed, and there is also a greater risk of missing data and achieving lower response rates (Bryman & Bell, 2015).
Online surveys as a web-based method of data collection have some advantages over postal surveys. The internet is increasingly used as a tool for conducting social scientific research, such as online surveys. There are two types of online surveys: email and web-based surveys (van Selm & Jankowski, 2006). While both methods can be efficient data collection techniques for cross-sectional studies because of their lower costs and faster response rates (Ilieva, Baron, & Healey, 2002; Zikmund et al., 2013), using a web-based survey has a greater advantage over an email or postal survey. Web-based surveys typically feature shorter response times and higher completed response rates (Braunsberger, Wybenga, & Gates, 2007; McDevitt & Small, 2002), and they provide instant access to a wider pool of respondents across a larger geographic area (van Selm & Jankowski, 2006).

The anonymity of the internet also encourages respondents to provide honest answers to sensitive questions (Zikmund et al., 2013), such as the business performance questions in this study. Further, data from the online survey can be automatically transferred into the data analysis software of choice, such as SPSS, which results in saving time and greater data accuracy through avoiding manual data entry (Ilieva et al., 2002; Wright, 2005).

In contrast, postal surveys can have some practical issues, such as poor and slow response rates, the cost of postage and difficulty in the transition of the data from the questionnaires to statistical analysis software, which may lead to data entry errors (Cobanoglu, Warde, & Moreo, 2001; Deutskens, de Ruyter, Wetzes, & Oosterveld, 2004; Ilieva et al., 2002).

Despite the advantages of the online survey method, it also suffers from a number of possible problems. One potential problem is that respondents might be concerned about their anonymity (Wright, 2005). The literature recommends mentioning that their anonymity is guaranteed, which results in increasing the honesty of respondents when answering the questions (Ilieva et al., 2002). That is, anonymity and independence between the researcher and respondents ensure a high degree of data reliability (Bulmer, Gibbs, & Hyman, 2010). Therefore, to overcome this limitation, I used an anonymous questionnaire, and no personal information or contact details were asked of the respondents.
Another significant concern of web-based surveys is the need to employ a user-friendly online platform (Ilieva et al., 2002). In this research, this issue was addressed by using the Qualtrics online survey platform to design and host the questionnaire. Qualtrics is a widely used platform and features a number of format and layout techniques that facilitate good questionnaire design. In addition, one of the advantages of this online platform is its ability to use branching/skip logic and to export the collected data as an Excel or SPSS file for further analysis.

Dealing with missing data is another challenge in the data analysis process (Wulff & Ejlskov, 2017). In this study, the researcher used a forced answering rules option for the online questionnaire, which eliminated the missing data issue. This rule was adopted with the aim of reducing the likelihood of incomplete questionnaires being submitted. Accordingly, there was no missing values issue for this research.

4.5 Survey Development Process

To develop the questionnaire, the following steps were conducted. First, the constructs to be measured were determined, including exploration and exploitation capabilities, customer involvement and customer sophistication, and innovation performance. In the second step, an operationalised definition was provided for each construct from a critical review of the literature, which is suggested to be the best technique for developing the questionnaire (Bryman & Bell, 2015; Hair Jr, Wolfinbarger, Money, Samouel, & Page, 2015).

The questionnaire was then designed and coded online using the Qualtrics platform. Online versions of the questionnaire were revised several times based on the feedback from OSPs’ managers and the thesis supervisors to ensure its quality. In the final step, a pilot test was conducted to increase the validity and ease-of-use of the questionnaire (Cavana, Delahaye, & Sekaran, 2001). A pilot study was undertaken by four project managers in four different service provider companies adapted from the target population. The online questionnaire was further refined based on the results and feedback of the pilot study.
4.6 Sample Population

The sample for the study was drawn from an international population of OSPs. The sample was drawn from several databases. The first database is the membership database of International Association of Outsourcing Professionals\(^1\) (IAOP), which is a leading global association whose members include outsourcing organisations, advisories and outsourcing service providers. This was supplemented by companies that were selected as the best 100 OSPs in 2016 in the Global Outsourcing Survey.

The sample consisted of OSPs that differed with respect to their age, size, the nature of the service provided, the number of provided outsourcing projects (during the past three years), headquarters locations and industries. Table 3.1 provides a summary of characteristics of the companies included in the sample.

<table>
<thead>
<tr>
<th>Table 3.5: Characteristics of responding firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>% companies</td>
</tr>
<tr>
<td>Firm size (number of employees)</td>
</tr>
<tr>
<td>Small (1–19)</td>
</tr>
<tr>
<td>Medium (20–199)</td>
</tr>
<tr>
<td>Large (200 or more)</td>
</tr>
<tr>
<td>Firm age (number of years in business)</td>
</tr>
<tr>
<td>0–3</td>
</tr>
<tr>
<td>4–10</td>
</tr>
<tr>
<td>11–20</td>
</tr>
<tr>
<td>21–30</td>
</tr>
<tr>
<td>31 or more</td>
</tr>
<tr>
<td>Industry type</td>
</tr>
<tr>
<td>Transportation</td>
</tr>
<tr>
<td>Business process services</td>
</tr>
<tr>
<td>Consulting</td>
</tr>
<tr>
<td>Data management</td>
</tr>
<tr>
<td>Education</td>
</tr>
</tbody>
</table>

\(^1\) https://www.iaop.org/
<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entertainment and media</td>
<td>4.8</td>
</tr>
<tr>
<td>Financial services (banking, insurance, markets)</td>
<td>17.1</td>
</tr>
<tr>
<td>Health care</td>
<td>6.1</td>
</tr>
<tr>
<td>Human resource services</td>
<td>9.7</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>13.4</td>
</tr>
<tr>
<td>Retail and consumer goods</td>
<td>7.3</td>
</tr>
<tr>
<td>Telecommunication</td>
<td>13.4</td>
</tr>
<tr>
<td>Technology (hardware, software)</td>
<td>31.7</td>
</tr>
<tr>
<td>Others</td>
<td>5.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of provided outsourcing projects (during the past three years)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5</td>
<td>19.5</td>
</tr>
<tr>
<td>6–10</td>
<td>24.4</td>
</tr>
<tr>
<td>11 or more</td>
<td>56.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Headquarters region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Americas (North, Latin and the Caribbean)</td>
<td>21</td>
</tr>
<tr>
<td>Europe</td>
<td>16.9</td>
</tr>
<tr>
<td>Asia</td>
<td>12.3</td>
</tr>
<tr>
<td>Middle East</td>
<td>24.7</td>
</tr>
<tr>
<td>Oceania</td>
<td>23.9</td>
</tr>
<tr>
<td>Africa</td>
<td>1.2</td>
</tr>
</tbody>
</table>

The target group of respondents included middle-level managers and higher. This study assumed that middle-level managers would have the required level of knowledge of the project and thus could give reliable answers. The invitations were sent to 280 respondents by email. Following the initial invitation, a reminder was sent after two weeks’ time, and a usable sample consisting of 81 responses was received by the cutoff date (response rate of 28%).

The procedure for the research began with a pilot questionnaire that was sent to the OSPs to examine the questionnaire for meaningfulness and clarity. After the pilot study, the survey was sent to a sample of OSPs. The team leaders of service projects were the target group. It was assumed that middle-level managers would have a good
knowledge of the project and thus could give reliable answers. The survey link was initially sent to respondents by email.

The targeted sample was contacted through an email asking for their willingness to participate in the research. The email included an introduction to the research project and an invitation to complete the online questionnaire. After receiving their consent, they were asked to share the survey link with the middle manager of their company.

**4.7 Ethical Implications**

In this thesis, given the involvement of human participants in data gathering, ethical consideration had to be applied. Therefore, the University of Newcastle’s procedure for ethical considerations was followed. According to the University of Newcastle’s policies and guidelines, all research projects that involve human participants and that are conducted either by university staff or students of the university are required to obtain approval from the university’s Human Research Ethics Committee (HREC) prior to the commencement of the research. The HREC follows the guidelines provided by the National Statement on Ethical Conduct in Human Research (University Of Newcastle -UON, 2017).

Therefore, an application for human research ethics consideration along with a final copy of the survey instrument was submitted for peer review and the HREC’s consideration. To address the ethical considerations of the research, the following steps were followed.

First, respondents were provided with a Participant Information Sheet (PIS) on the first page of the questionnaire. The PIS explained to the participants that participating in the survey was entirely voluntary and that respondents remained anonymous (see Appendix C for the PIS).

Second, no personally identifiable information was asked; only basic individual and firm demographic information was sought. The data were then downloaded from the Qualtrics platform for further analysis. Finally, soft copies of the data were secured in the Qualtrics online database, which is under the University of Newcastle’s licence and is password-protected.
4.8 Chapter Summary

This chapter encompassed the description of the research paradigms, the research design, the data collection instrument and the process for developing the survey instrument. The data analysis techniques used in this research, along with the sample population and ethical issues of this research, were also detailed.
Chapter 5: Interaction Between Service Providers’ Capabilities and Customer Characteristics

5.1 Introduction

This chapter tests the hypotheses, describes the analysis and reviews the results of Study 1. It begins with a description of the methodology that has been used for testing the hypotheses to provide answers to the research questions, followed by statistical analysis of the data. This is followed by a discussion of the results.

5.2 Methodology

The hypotheses were tested through hierarchical OLS regression analysis, with a composite measure of innovation performance as the dependent variable. Hence, I tested the hypotheses with successive OLS regression models, the gradual building of separate but related models with an increasing number of independent variables, until I reached the final model, in which all independent variables are included.

5.3 Conceptual Framework and Measurement

The conceptual framework of this study is presented in Figure 5.1. Innovation is an ongoing process consisting of different phases. As there are many innovation indicators, researchers have argued that each individual indicator is just a partial indication of the total realised innovation effort of a subject (Hollenstein, 1996). Accordingly, composite indexes function better as a tool of measuring innovative performance compared with individual indicators (Makkonen & van der Have, 2013). Therefore, measuring innovation with the use of composite innovation indexes is superior to any single innovation variable (Hollenstein, 1996), and the use of indexes is considered an appropriate way of synthesising the information provided by several indicators into one combined measure (Coad & Rao, 2008; Tang & Le, 2007). To capture the varied aspects of innovation performance, Chen et al. (2009) made a construct for measuring product, service, process and overall appraisal of organisational innovation on the basis of several criteria, such as if the company can develop its service quality or whether it can boost the commercialisation pace of its new services. Similarly, in pervious empirical studies of innovation, different items
were used to conceptualise innovation performance, including (1) whether the company can improve its service quality by innovation, (2) whether the company can accelerate the commercialisation pace of the new services by innovation, (3) whether the company obtains noticeable benefits from its new services, (4) whether the company can develop new technology to develop and improve its operation processes, and (5) whether the company purchases new equipment to foster productivity (Cordero, 1990; Govindarajan & Kopalle, 2006). Accordingly, different ranges of innovative activities in the context of service provider companies are included in the innovation performance measurement.

Figure 5.5: Conceptual framework

**Dependent variables.** Considering the span of innovative activities in the context of service provider companies and the variety of innovation outcomes, and to achieve improved measurement validity, composite measures are used for this study, composed of multiple indicators for the measurement of innovation. This should provide a more comprehensive way to measure the innovative performance of OSPs.

In this study, innovation performance is captured using nine items describing commonly used measures of innovativeness in the outsourcing industry. These items are based on existing literature (Liao et al., 2008; Škerlavaj et al., 2010; Wang & Ahmed, 2004) and modified to suite the context of this research. Respondents were asked to assess the innovation performance of their most recent outsourcing project.
based on nine items over the last three years on a five-point Likert scale ranging from strongly agree (5) to strongly disagree (1).

**Independent variables.** The measurement for exploitation and exploration capabilities was adapted from previous studies (Atuahene-Gima, 2005; Hernández-Espallardo, Sánchez-Pérez, & Segovia-López, 2011; Jansen et al., 2006). *Exploitation capability* was measured by asking respondents to rate the extent to which the service provider tried to continuously improve its project’s processes and services using a five-point Likert scale ranging from 1 = very rarely to 5 = very frequently (Yalcinkaya, Calantone, & Griffith, 2007). Likewise, *exploration capability* was operationalised as a five-point Likert scale measure to assess the extent to which OSPs chose new approaches to the services project that were different from those used in the past (Yalcinkaya et al., 2007), and to what extent the considered service project included some new aspects to its processes and services compared with previous approaches.

Respondents were asked to consider projects within a three-year period because of the lag effects that are likely to exist between OSP innovativeness and its actual effect on its innovation performance (Lin et al., 2013). Following previous studies (He & Wong, 2004; Schulze, Heinemann, & Abedin, 2008), *ambidexterity* was measured as the multiplicative interaction of exploitation and exploration, which are captured by the two seven-item scales developed by Jansen et al. (2006).

*Exploration capability.* The items that represent the OSPs’ capability in experimenting with new alternatives that are associated with search, discovery and innovation are adopted from previous studies for measuring exploration capability of OSPs in this thesis. He and Wong (2004) considered four items to examine the extent to which the statements are true in terms of product improvement in a firm: introduction of new generations of products, extension of product range, opening up new markets and entering new technological fields.

The above measurement items were adapted from He and Wong (2004) to measure OSPs’ exploration capability as: introduced new generation of services to the market, extended the range of services compared with the past, opened new markets compared with the past and entered new technology fields in processes or services.
These items were deemed appropriate for the context of this study because they covered the key representative of exploitation capability and were modified to be representative of this construct in a service company. The same items have been applied to measure exploration capability in other studies (e.g., Hernández-Espallardo et al., 2011), thereby demonstrating their validity.

Atuahene-Gima (2005) developed a measure of exploration capability composed of seven items: entirely new technologies and skills, development of products and processes entirely new to the industry, identifying emerging markets and technologies, coordinating and integrating R&D, managing the product development process, funding new technology and development of R&D, and strengthened innovation skills.

This study applied the three modified items from Atuahene-Gima (2005) to be in line with the context of service providers: searching for new possibilities with respect to services or processes, evaluating various options with respect to services or processes and introducing the new market area in previous services. These items cover the service providers’ capability in applying new approaches and processes in service provision. Given the high degree of interactivity between service providers and customers (Wilson et al., 2016) in comparison with manufacturer companies (Westhead et al., 2001), these items were considered appropriate for this study.

*Exploitation capability.* The items that represent OSPs’ capability in refining and implementing established ideas, services and technologies and enhancing the efficiency were adopted from previous studies to measure OSPs’ exploration capability in this thesis. He and Wong (2004) considered four items to examine the extent to which the statements were true in terms of product improvement in a firm, improvement of product flexibility, reduction of production costs and enhancement of existing markets, which are also applicable in the context of service firms.

Hence, for exploitation capability, the measurement items adapted from He and Wong (2004) are improved quality of service provision processes to customers and improved efficiency of services in the project, developed procedures for service provision, enhanced service flexibility compared with the past and improved process of services provision to customers.
These items were considered appropriate for the context of this study because they covered the main representatives of exploitation capability and were modified to be representative of this construct in a service company. The same items have been applied to measure exploitation capability in other studies (e.g., Hernández-Espallardo et al., 2011), thereby demonstrating their validity.

To measure the extent to which service providers performed more efficiently as a result of the higher exploitative capability, the other two items were also adopted from Jansen et al. (2006): reduced service cost offered to customers and reduced time to respond to customer needs in providing the service to focus on the distinctive characteristics of service provision relative to manufacturing, whereby services provision involves a higher degree of interaction with customers, as an external contractor, compares with manufacturing (di Gregorio et al., 2009).

The indicators for measuring exploration and exploitation that were developed and adapted from previous studies are listed, along with the modified questionnaire, in Appendix C and D. Respondents were asked to consider projects within a three-year period because of the lag effects that are likely to exist between OSP innovativeness and its actual effect on its innovation performance (Lin et al., 2013).

The indicators for measuring exploration and exploitation that were developed and adapted from previous studies are listed, along with the modified questionnaire, in Appendix C and D.

*Customer involvement* was measured by asking the OSPs’ managers to estimate the level of customer involvement on a Likert scale. Based on previous studies (Gruner & Homburg, 2000; Paasi et al., 2014), respondents were asked to rate the level of customer involvement by rating the level of customers’ cooperation with the service provider company in developing new services, the degree of customers’ participation in offering the new services and whether or not the customer was active in developing the new services that their company offered. They were also asked to rate the involvement of the customer based on the constructive suggestions that they made for service improvement, and if the customer participated in introducing or improving the services.
Customer sophistication was measured using survey items adapted from Berthon, Pitt, McCarthy and Kates (2007), Lüthje and Herstatt (2004), Urban and von Hippel (1988) and von Hippel (1986). More specifically, respondents were asked to rate the following characteristics of their users: being ahead of the other customers in recognising and planning new solutions to the problems they encounter; offering new and different solutions to meet their needs and being pioneers in applying new technologies in their company; recognising service benefits earlier in comparison with other customers; expecting high benefits from the services they receive from the providers; experiencing new service needs earlier than most other customers; showing high need for using such services; early adoption and use of outsourcing services and suggesting new demands for the service development.

Customer location is a dichotomous variable representing whether a customer of the most recent project is located onshore or offshore (value 1 for offshore customer and 0 otherwise).

Control variables. To account for exogenous influences on OSPs’ innovativeness, firm size and firm age were entered as control variables in this study.

Firm size can either dampen innovativeness because it creates inertia, or it can enhance innovativeness because larger firms typically have more resources (Damanpour, 1992) and more advanced organisational processes and knowledge than smaller firms (Hage, 1980). Further, they are more likely to generate additional resources that can be invested in exploration or exploitation capabilities (Klepper, 1996). However, large-scale and advanced organisational development can also create rigidities (Leonard-Barton, 1992). Further, larger organisations may have better access to internal and external resources that allow a more effective search for new knowledge. This study calculates firm size by taking the natural logarithm of the number of full-time employees. Firm age is also controlled because it might influence the innovation performance of a firm (Forés & Camisón, 2016). Older firms can be more passive than dynamic (Hannan & Freeman, 1984), and this may lead to lower levels of innovativeness than younger firms. Firm age was measured as the natural logarithm of the number of years since the firm was founded (e.g., Siegel & Hambrick, 2005).

Table 5.1 provides summary statistics for the dependent and explanatory variables used in the empirical analysis. Correlation coefficient values are calculated among all
the factors to determine the internal consistency of the factors. The values do not show any significant correlation among the factors considered in this study, suggesting that all factors considered are independent, although related to each other.
Table 5.6: Summary statistics, correlations and significance level between main variables

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std dev.</th>
<th>Min</th>
<th>Max</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Innovation performance</td>
<td>3.570</td>
<td>.6461</td>
<td>1.818</td>
<td>5</td>
<td>1</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Company size</td>
<td>2.222</td>
<td>.6519</td>
<td>1</td>
<td>3</td>
<td>−0.142</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Company age</td>
<td>19.765</td>
<td>12.440</td>
<td>3</td>
<td>40+</td>
<td>−0.169</td>
<td>0.515*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Exploitation capability</td>
<td>3.777</td>
<td>.5745</td>
<td>2.285</td>
<td>5</td>
<td>0.291*</td>
<td>0.214</td>
<td>−0.061</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Exploration capability</td>
<td>3.543</td>
<td>.6861</td>
<td>2</td>
<td>5</td>
<td>0.431*</td>
<td>0.170</td>
<td>−0.211</td>
<td>0.660*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Customer location</td>
<td>.4814</td>
<td>.5027</td>
<td>0</td>
<td>1</td>
<td>−0.191</td>
<td>0.279*</td>
<td>0.338*</td>
<td>−0.101</td>
<td>−0.002</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Customer sophistication</td>
<td>3.508</td>
<td>.6123</td>
<td>2</td>
<td>4.555</td>
<td>0.175</td>
<td>0.224*</td>
<td>−0.095</td>
<td>0.449*</td>
<td>0.574*</td>
<td>0.109</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Customer involvement</td>
<td>3.376</td>
<td>.6966</td>
<td>1.833</td>
<td>4.666</td>
<td>0.402*</td>
<td>0.281*</td>
<td>−0.058</td>
<td>0.475*</td>
<td>0.649*</td>
<td>−0.042</td>
<td>0.694*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>9. Ambidexterity (exploration ×</td>
<td>13.642</td>
<td>4.192</td>
<td>5.142</td>
<td>25</td>
<td>0.422*</td>
<td>0.203</td>
<td>−0.167</td>
<td>0.874*</td>
<td>0.934*</td>
<td>−0.068</td>
<td>0.581*</td>
<td>0.638*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: * p-values < 0.05
5.4 Model Estimation and Results

As shown in Table 5.2, the full collinearity variance inflation factors (VIFs) are lower than the maximum tolerable value of 5 (Hair Jr, Anderson, Babin, & Black, 2010), which suggests that multicollinearity is not an issue in the measurement model.

Table 5.7: Multicollinearity test among variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>1/VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration capability</td>
<td>2.67</td>
<td>0.374</td>
</tr>
<tr>
<td>Customer involvement</td>
<td>2.54</td>
<td>0.392</td>
</tr>
<tr>
<td>Customer sophistication</td>
<td>2.17</td>
<td>0.460</td>
</tr>
<tr>
<td>Exploitation capability</td>
<td>1.91</td>
<td>0.522</td>
</tr>
<tr>
<td>Company age</td>
<td>1.68</td>
<td>0.594</td>
</tr>
<tr>
<td>Company size</td>
<td>1.65</td>
<td>0.606</td>
</tr>
<tr>
<td>Customer location</td>
<td>1.28</td>
<td>0.783</td>
</tr>
<tr>
<td>Mean VIF</td>
<td>1.99</td>
<td></td>
</tr>
</tbody>
</table>

The results of the regression analysis are presented in Tables 5.4, 5.5 and 5.6. A robustness check was also performed in this model to compare the OLS regression and robust regression models (Li, 1985). The finding showed that the coefficients between two models are not significantly different (Prob > F = 0.0002), suggesting that the coefficients are robust (Verardi & Croux, 2009). Stata comment and its result for the robustness check on the OLS model is provided in Appendix E.

In Table 5.3, Model 1 includes the relationships between the control variables and OSPs’ innovation performance. Model 2 includes the main variables, and ambidexterity is added in Model 3 (measured as the interaction between exploration and exploitation capabilities).

In Table 5.4, Model 4 and Model 5 show the moderation effects of customer characteristics on exploration and exploitation capabilities respectively. Table 5.5 shows the three-way interaction between customer sophistication, exploration and exploitation capabilities.
capabilities (Model 6) and the three-way interaction between customer involvement, exploration and exploitation capabilities (Model 7).

Table 5.8: Relationships between control variables (Model 1) and main variables with and without ambidexterity (Model 2, Model 3)

<table>
<thead>
<tr>
<th>Variables</th>
<th>(Model 1) Control variables</th>
<th>(Model 2) Main variables</th>
<th>(Model 3) Main variables + ambidexterity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploitation capability</td>
<td>0.035</td>
<td>−0.705</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.149)</td>
<td>(0.526)</td>
<td></td>
</tr>
<tr>
<td>Exploration capability</td>
<td>0.330**</td>
<td>−0.533</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.148)</td>
<td>(0.606)</td>
<td></td>
</tr>
<tr>
<td>Ambidexterity (exploration × exploitation)</td>
<td>0.227</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.154)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer location</td>
<td>−0.118</td>
<td>−0.071</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.139)</td>
<td>(0.142)</td>
<td></td>
</tr>
<tr>
<td>Customer sophistication</td>
<td>−0.253*</td>
<td>−0.287*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.149)</td>
<td>(0.150)</td>
<td></td>
</tr>
<tr>
<td>Customer involvement</td>
<td>0.380***</td>
<td>0.374***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.142)</td>
<td>(0.141)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.870***</td>
<td>2.479***</td>
<td>5.366***</td>
</tr>
<tr>
<td></td>
<td>(0.256)</td>
<td>(0.478)</td>
<td>(2.023)</td>
</tr>
<tr>
<td>Company size</td>
<td>−0.075</td>
<td>−0.288**</td>
<td>−0.289**</td>
</tr>
<tr>
<td></td>
<td>(0.129)</td>
<td>(0.122)</td>
<td>(0.121)</td>
</tr>
<tr>
<td>Company age</td>
<td>−0.007</td>
<td>0.005</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.006)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Observations</td>
<td>81</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.033</td>
<td>0.327</td>
<td>0.346</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
Table 5.9: Models showing moderation effects of customer sophistication and involvement on exploration (Model 4) and exploitation (Model 5)

<table>
<thead>
<tr>
<th>Variables</th>
<th>(Model 4)</th>
<th>(Model 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderation of exploration</td>
<td>Moderation of exploitation</td>
</tr>
<tr>
<td>Exploitation capability</td>
<td>0.007</td>
<td>−0.635</td>
</tr>
<tr>
<td></td>
<td>(0.586)</td>
<td>(0.727)</td>
</tr>
<tr>
<td>Exploration capability</td>
<td>0.0315</td>
<td>−0.207</td>
</tr>
<tr>
<td></td>
<td>(0.677)</td>
<td>(0.869)</td>
</tr>
<tr>
<td>Ambidexterity</td>
<td>0.003</td>
<td>0.146</td>
</tr>
<tr>
<td>(exploration × exploitation)</td>
<td>(0.174)</td>
<td>(0.230)</td>
</tr>
<tr>
<td>Customer location</td>
<td>1.658**</td>
<td>1.053</td>
</tr>
<tr>
<td></td>
<td>(0.682)</td>
<td>(0.970)</td>
</tr>
<tr>
<td>Customer sophistication</td>
<td>0.644</td>
<td>−0.166</td>
</tr>
<tr>
<td></td>
<td>(0.791)</td>
<td>(0.949)</td>
</tr>
<tr>
<td>Customer involvement</td>
<td>−1.237*</td>
<td>−0.161</td>
</tr>
<tr>
<td></td>
<td>(0.670)</td>
<td>(1.007)</td>
</tr>
<tr>
<td>Customer location × exploration</td>
<td>−0.480**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.189)</td>
<td></td>
</tr>
<tr>
<td>Customer sophistication ×</td>
<td>−0.290</td>
<td></td>
</tr>
<tr>
<td>exploration</td>
<td>(0.230)</td>
<td></td>
</tr>
<tr>
<td>Customer involvement × exploration</td>
<td>0.464**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.193)</td>
<td></td>
</tr>
<tr>
<td>Customer location × exploitation</td>
<td></td>
<td>−0.297</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.254)</td>
</tr>
<tr>
<td>Customer sophistication ×</td>
<td></td>
<td>−0.0416</td>
</tr>
<tr>
<td>exploitation</td>
<td></td>
<td>(0.254)</td>
</tr>
<tr>
<td>Customer involvement × exploitation</td>
<td></td>
<td>0.140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.270)</td>
</tr>
<tr>
<td>Company size</td>
<td>−0.354***</td>
<td>−0.313**</td>
</tr>
<tr>
<td></td>
<td>(0.116)</td>
<td>(0.127)</td>
</tr>
<tr>
<td>Company age</td>
<td>0.006</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Observations</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.448</td>
<td>0.362</td>
</tr>
</tbody>
</table>

Notes: Standard errors in parentheses *** p < 0.01, ** p < 0.05, * p < 0.1
**Table 5.10: Models showing three-way interactions among customer sophistication and involvement × exploitation capability × exploration capability**

<table>
<thead>
<tr>
<th>Variables</th>
<th>(Model 6) 3-way interaction for customer sophistication</th>
<th>(Model 7) 3-way interaction for customer involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploitation capability</td>
<td>10.43*** (3.012)</td>
<td>6.458*** (2.360)</td>
</tr>
<tr>
<td>Customer sophistication</td>
<td>11.74*** (3.124)</td>
<td></td>
</tr>
<tr>
<td>Customer sophistication × exploitation capability</td>
<td>−3.258*** (0.874)</td>
<td></td>
</tr>
<tr>
<td>Exploration capability</td>
<td>12.69*** (3.398)</td>
<td>7.870** (3.186)</td>
</tr>
<tr>
<td>Customer sophistication × exploration capability</td>
<td>−3.831*** (0.975)</td>
<td></td>
</tr>
<tr>
<td>Exploitation capability × exploration capability</td>
<td>−3.328*** (0.912)</td>
<td>−2.133** (0.807)</td>
</tr>
<tr>
<td>Customer sophistication × exploitation capability × exploration capability</td>
<td>1.030*** (0.258)</td>
<td></td>
</tr>
<tr>
<td>Customer involvement</td>
<td>7.615** (2.880)</td>
<td></td>
</tr>
<tr>
<td>Customer involvement × exploitation capability</td>
<td>−2.096*** (0.739)</td>
<td></td>
</tr>
<tr>
<td>Customer involvement × exploration capability</td>
<td>−2.422** (0.934)</td>
<td></td>
</tr>
<tr>
<td>Customer involvement × exploitation capability × exploration capability</td>
<td>0.672*** (0.232)</td>
<td></td>
</tr>
<tr>
<td>Company size</td>
<td>−0.273** (0.115)</td>
<td>−0.324*** (0.119)</td>
</tr>
<tr>
<td>Company age</td>
<td>0.006 (0.006)</td>
<td>0.008 (0.006)</td>
</tr>
<tr>
<td></td>
<td>(10.60)</td>
<td>(9.075)</td>
</tr>
<tr>
<td>Observations</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.407</td>
<td>0.396</td>
</tr>
</tbody>
</table>

Notes: Standard errors in parentheses *** p < 0.01, ** p < 0.05, * p < 0.1.
The results from Model 2, including all main variables, show a significant positive effect of exploration capability on the innovation performance of OSPs (β = 0.330, p < 0.05). This supports Hypothesis 1, that OSPs’ exploration capability positively affects their innovation performance. There was no significant relationship between exploitation capability and innovation performance, thereby rejecting Hypothesis 2. Further, the direct effect of ambidexterity on innovation performance does not show any significant relationship, thereby rejecting Hypothesis 3.

The result also shows a significant positive effect of customer involvement on innovation performance (β = 0.380, p < 0.01), which supports Hypothesis 4, a negative effect of customer sophistication on innovation performance of OSPs (β = −0.253, p < 0.1), which rejects Hypothesis 5, and no significant relationship between customer location and innovation performance, which rejects Hypothesis 6.

Adding a three-way interaction between customer sophistication, exploration capability and exploitation capability, Model 6 shows a positive and significant effect on innovation performance (β = 1.030, p < 0.01), thereby supporting Hypothesis 7. A similar result was obtained for customer involvement; when both exploitation and exploration capabilities are high, customer involvement increases OSPs’ innovation performance significantly (β = 0.672, p < 0.01), which supports Hypothesis 8. These effects are shown graphically in Figures 5.2 and 5.3 respectively.

Figure 5.2 shows the different combinations of high exploration/low exploitation (H EXPR/L EXPR), and high exploitation/low exploitation (H EXPI/L EXPI) shows this more clearly. As shown in Figures 5.2 and 5.3, the slopes of the graphs of customer involvement (X1) and customer sophistication (X2) respectively on innovation performance (Y) vary with each of the four combinations of H EXPR/L EXPR/H EXPI/L EXPI. The line for the combination of high exploration/high exploitation (H EXPR/H EXPI) has the steepest gradient in both figures, showing that customer involvement and customer sophistication have the greatest effect on the innovation performance of the firms that have both high exploration and high exploitation capabilities. In short, firms that are high in all three areas tend to perform better than firms that are high in only two areas.
Figure 5.6: Interaction between ambidextrous OSPs and customer involvement

Notes: X1: customer involvement, Y: innovation performance, EXPR: exploration capability, EXPI: exploitation capability

Figure 5.7: Interaction between ambidextrous OSPs and customer sophistication

Notes: X2: customer sophistication, Y: innovation performance, EXPR: exploration capability, EXPI: exploitation capability
The results also suggest that ambidextrous learning capability for OSPs on its own does not necessarily affect their innovation performance. Such capability needs to occur jointly with customer sophistication and customer involvement to influence innovation performance positively.

5.5 Chapter Summary

The main objective of this study was to assess how the interaction between learning capabilities and customer characteristics of service providers affects innovation performance. Further to previous studies that showed that both internal capabilities and openness towards knowledge sharing are important for upgrading innovative performance (Caloghirou et al., 2004; Piller & Ihl, 2009), this study confirms the importance of both ambidextrous learning capabilities and customer characteristics in determining the innovation performance of service providers. The results of this study show that participation of more sophisticated customers can lead to a higher innovation performance, which is consistent with previous studies that have shown how cooperating with lead users can act as an important source of innovation for firms (Jeppesen & Laursen, 2009; von Hippel, 2005). The previous studies also found that contributing customers should have lead user characteristics (Gruner & Homburg, 2000; Urban & von Hippel, 1988) for achieving higher innovation performance, and literature has highlighted the benefits of interaction with lead users (Hagedoorn, 1993; von Hippel, 1978). It is also consistent with the open innovation paradigm (Chesbrough, 2003, 2006, 2011), which assumes that organisations can and should use external ideas along with internal ideas, and internal and external paths to market, because firms want to boost their technology (Chesbrough, 2003), and engaging with customers can improve the market requirement for innovated services and processes (Mina, Bascavusoglu-Moreau, & Hughes, 2014).

This is consistent with previous studies of organisational learning that have shown the importance of possessing both exploitation and exploration capabilities (March, 1991) and studies that have highlighted the benefits of achieving the right combination of exploration and exploitation (i.e., ambidexterity) (He & Wong, 2004).

However, the results show that not only the net effect of customer characteristics, exploration and exploitation learning capabilities matter, but also, more importantly, the
effects of customer characteristics, exploration and exploitation learning capabilities are contingent on each other. That is, the effect of the level of customer involvement on OSPs’ innovation performance depends on firms’ exploration and exploitation capabilities and vice versa. This is consistent with previous studies, which suggest that most service improvements need both the service provider and the client to adjust and develop their own processes and capabilities (Möller, Rajala, & Westerlund, 2008).

This implies that not all customers equally contribute to the innovation process and that not all firms can benefit from their customer inputs. Therefore, firms need to be aware of their own learning capabilities and strategically match the level of customer involvement and sophistication with their capabilities.
Chapter 6: Heterogeneity of Customers

6.1 Introduction

While the multiple regression analysis in the previous study provided evidence for the effect of ambidexterity on innovation performance, multiple regression models suffer from a number of weaknesses (i.e., the inability to include latent variables with multiple indicators). For example, whereas ambidexterity is measured as a multiplicative product of the average exploration and exploitation scores in Study 1, it might be better measured as a single latent variable with exploration and exploitation dimensions. It is therefore desirable to apply SEM techniques in this research alongside multiple regression because SEM allows more complex models that overcome some of the weaknesses of multiple regression.

Accordingly, the data were also analysed using PLS-SEM through Smart PLS 3.2 (Ringle, Wende, & Will, 2005). In the rest of this chapter, I will discuss the reasoning and advantages of using PLS-SEM approach. This will be followed by an evaluation of the outer (measurement) model, which includes an evaluation of the reliability and validity of the constructs. Finally, the results of the structural model evaluation are provided.

6.2 Methodology

6.2.1 Structural equation modelling

SEM is a second-generation multivariate analysis technique (Chin, 1998; Fornell, 1985; Guarino, 2004) that combines the techniques used in multiple regression and factor analysis (Pallant, 2013; Tharenou, Donohue, & Cooper, 2007). It is a sophisticated technique used to examine the interrelationships among a set of variables in a complex model that can have one or more independent variables and one or more dependent variables (Ghauri & Grønhaug, 2005; Kline, 2005; Pallant, 2013; Polonsky & Waller, 2014; Tharenou et al., 2007), and that analyses multiple variables simultaneously (Fornell, 1985; Lim & Ling, 2011). With SEM, both direct effects and indirect (mediating) effects can be tested (Polonsky & Waller, 2014; Tharenou et al., 2007).
SEM has several advantages over first-generation modelling (e.g., analysis of variance and multiple regressions). These advantages include the provision of integrative functions while also allowing for the precise specification of hypotheses and operationalisation of constructs (Bagozzi & Yi, 2012). Further, this statistical technique has the ability to test the latent variables at the observation level (outer model) and test the relationships of latent variables at the theoretical level (inner model) (Bollen, 1989).

This is particularly relevant in this study, which has multiple measures that can be measured as latent variables (i.e., exploration and exploitation capabilities and ambidexterity as a combination of both). SEM is also particularly suitable for analysing higher-order constructs (Wetzels, Odekerken-Schröder, & van Oppen, 2009), such as ambidexterity in this study, and complex conceptual models with moderation effects (Chin & Newsted, 1999; Peng & Lai, 2012), such as customer sophistication and customer involvement in this study.

6.2.2 Advantages of using partial least squares structural equation modelling

There are two types of SEM techniques (Hair Jr, Sarstedt, Ringle, & Gudergan, 2017; Ringle, Sarstedt, & Straub, 2012): covariance-based SEM (CB-SEM) (Bollen, 1989; Jöreskog, 1977) and PLS-SEM (Henseler, Fassott, Dijkstra, & Wilson, 2012). The PLS-SEM technique was adopted for this research because it has the following advantages over CB-SEM. First, the literature suggests using PLS-SEM over CB-SEM when the sample size is relatively small (Hair Jr, Ringle, & Sarstedt, 2011) and the data are non-normally distributed (Astrachan, Patel, & Wanzenried, 2014; Henseler, Ringle, & Sinkovics, 2009). For models with 20 or fewer latent constructs, using PLS is suggested (Kline, 2005; Tharenou et al., 2007). Second, PLS-SEM can include both reflective and formative measurement modes, whereas covariance-based SEM suffers limitations on this point (Chin, 1998; Hair Jr, Sarstedt et al., 2017; Henseler et al., 2009). This is discussed further below.

6.3 Operationalisation of Constructs in Partial Least Squares

The distinction between formative items and reflective items in a model is important for obtaining useful results in PLS-SEM (Coltman, Devinney, Midgley, & Venaik, 2008; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). One feature that can be used to distinguish between operationalising a construct as formative or reflective is considering
the interchangeability of the items of a construct. In the case where the items of a construct are interchangeable (e.g., bad–good, unfavourable–favourable, negative–positive), the construct needs to be operationalised as a reflective construct, which results in a positive and desirably high intercorrelation between the items (Coltman et al., 2008) and otherwise formative (Hair Jr, Hult, Ringle, & Sarstedt, 2017b).

Reflective constructs assume that the variation in the scores of the items of a construct is a function of the true score plus error. Therefore, the items are assumed to be reflective of the underlying construct, and the latent construct is assumed to cause the observed variation in the items (Podsakoff et al., 2003).

However, the assumption about reflective constructs (i.e., the direction of causality) is not conceptually appropriate in all cases. In fact, for some constructs, it is more appropriate that the causality flows from the items to the latent construct, which is the case for formative constructs (MacCallum & Browne, 1993; Podsakoff et al., 2003). In addition, a change in the composition of the items for a formative construct results in a change in the conceptual domain of the construct. In a formative construct, the items do not necessarily have a preconceived pattern of intercorrelation. However, the intercorrelation needs to be checked for being theoretically acceptable (Coltman et al., 2008). Another feature of relevance for this research is a set of activities constituting a construct, which implies a formative model (Coltman et al., 2008).

6.3.1 Higher-order constructs in partial least squares structural equation modelling

In this study, there are constructs with multiple measures, such as exploration and exploitation capabilities, customer involvement and customer sophistication, as well as innovation performance, which are best measured as latent constructs because they can handle multiple measures (i.e., exploration and exploitation capabilities and ambidexterity as a combination of them) rather than taking simple averages as in the previous study (Study 1).

According to Podsakoff, Shen and Podsakoff (2006), social science researchers should use higher-order models when the construct is complex because such models treat each dimension as an important component of the construct. Hierarchical latent variable models or higher-order constructs are explicit representations of multidimensional constructs that exist at a higher level of abstraction and are related to other constructs at
a similar level of abstraction, completely mediating the influence from or to their underlying dimensions (Becker, Klein, & Wetzels, 2012a; Chin, 1998).

The use of higher-order modelling has grown increasingly popular in recent years in the context of PLS-SEM models (Becker, Klein, & Wetzels, 2012b), such as in Wilden, Gudergan, Nielsen and Lings’ (2013) study, which applied the higher-order dynamic capabilities construct with three first-order constructs (sensing, seizing and reconfiguring). Carlson, Rosenberger III and Rahman (2016) conceptualised perceived value of the group-travel experience to a major event as a hierarchical, multidimensional construct with seven dimensions (monetary value, epistemic value, functional value, hedonic value, convenience value, social value, functional value) of the major event. Malik, Rosenberger III, Fitzgerald and Houlcroft (2016) modelled the ‘perceived smart work hubs’ value as a hierarchical, multidimensional construct with two dimensions (work value and family value). Such constructs are a clear representation of multidimensional constructs (Chin, 1998), which encompass a number of interrelated dimensions (Becker et al., 2012b), whereby all dimensions are distinct in nature and are not interchangeable. Further, the use of a higher-order construct allows for greater theoretical parsimony and lower model complexity (Hagger & Chatzisarantis, 2005; Hair Jr et al., 2017b; Law, Wong, & Mobley, 1998).

According to Law et al. (1998), a construct is defined as multidimensional when it consists of a number of interrelated attributes or dimensions and exists in multidimensional domains. In contrast to a set of interrelated unidimensional constructs, the dimensions of a multidimensional construct can be conceptualised under an overall abstraction, and it is theoretically meaningful and parsimonious to use this overall abstraction as a representation of the dimensions. Thus, multidimensional constructs can be distinguished from unidimensional constructs, which are characterised by a single underlying dimension (Netemeyer, Bearden, & Sharma, 2003).

A higher- or second-order construct can be either reflective or constituted formative, based on its dimensions (lower- or first-order constructs) (Becker et al., 2012b; Wetzels, Odekerken-Schröder, & van Oppen, 2009). Therefore, the relation between the higher- and lower-order constructs is not a question of causality, but a question of the nature of the hierarchical latent variable, because the higher-order construct (the general concept)
does not exist without its lower-order constructs (dimensions) (Becker et al., 2012a), each
of which represents an important aspect of the construct (Bollen & Lennox, 1991).

There are four types of higher-order constructs in the literature: reflective–reflective
(Type I), reflective–formative (Type II), formative–reflective (Type III) and formative–
formative (Type IV) (Becker et al., 2012b; Podsakoff et al., 2003). If the higher-order
construct is reflective, the general concept is manifested by several specific dimensions
themselves being latent (unobserved). If the higher-order construct is formative, it is a
combination of several specific (latent) dimensions into a general concept (Edwards,
2001; Wetzels et al., 2009). In this study, ambidexterity is operationalised as a higher-
order multidimensional construct, specified as a Type II higher-order reflective–
formative construct, which will be discussed in the subsequent section.

6.4 Measurement

In this section, the measurement of the key constructs of the proposed conceptual
framework are discussed, including the ambidexterity, exploration and exploitation
capabilities. As discussed in Chapter 5, all key variables (i.e., exploration capability,
exploitation capability, customer involvement, customer sophistication and innovation
performance) were measured on five-point Likert scales (1 = very rarely, 5 = very
frequently), which were adapted from previous studies (Atuahene-Gima, 2005;
Hernández-Espallardo et al., 2011; Jansen et al., 2006).

**Ambidexterity:** According to Podsakoff et al. (2006), social science researchers should
use higher-order models when the construct is complex because such models treat each
dimension as an important component of the construct. Therefore, in contrast to Study 1,
the ambidexterity measure in this study is operationalised as a multidimensional second-
order construct that comprises exploration and exploitation capabilities as the first-order
constructs (Kortmann, Gelhard, Zimmermann, & Piller, 2014; Kristal et al., 2010;

In this study, exploration and exploitation are modelled as formative constructs, because
the items for each of the two constructs are not interchangeable and share the same
antecedents and consequences within their own membership (Jarvis, MacKenzie, &
Podsakoff, 2003; Wilden et al., 2013). Ambidextrous capability is modelled as a second-
order latent construct reflected by two first-order constructs: exploration (six items) and
exploitation (seven items) capabilities. Further, ambidexterity is modelled as a formative variable (i.e., one that is a composite of multiple measures) (Petter, Straub, & Rai, 2007). In this case, it is a composite of exploration and exploitation (Vidgen, Allen, & Finnegan, 2011). In addition, this study employs formative constructs for exploration and exploitation in which indicators define or cause the construct (Hulland, 1999; Menguc & Auh, 2008).

The repeated indicator approach (Becker et al., 2012a) uses the hierarchical model approach (Wetzels et al., 2009) and requires the use of the variables both on the first order and then repeated on the second-order latent variables. Hence, ambidexterity is operationalised as a higher-order multidimensional construct, specified as a Type II higher-order reflective–formative construct, as the two dimensions are distinct in nature and are not interchangeable (Becker et al., 2012b; Ruiz, Gremler, Washburn, & Carrión, 2008). Further, lower-order constructs are considered different organisational processes (Wilden et al., 2013) that come together to represent the ambidexterity construct. Moreover, omitting any one of these first-order constructs would result in a change in the overall meaning of the construct (Diamantopoulos & Winklhofer, 2001).

The other constructs, including exploitation and exploration capabilities, customer involvement, customer sophistication and innovation performance, are similar to Study 1 (see Section 5.3 for more details).

**6.5 Evaluation of the Structural Model (Outer and Inner Model Evaluation)**

Figure 6.1 shows the model tested. PLS-SEM assessment features a two-stage process of testing the outer (measurement) model and inner (structural) model (Hair Jr, Hult, Ringle, & Sarstedt, 2017a). In the first stage, the outer (measurement) model evaluation was conducted; that is, the relationship between the indicators and their respective constructs was examined. This evaluation involved examining the concepts of validity and reliability for the formative constructs (i.e., collinearity between indicators and significance and relevance of formative indicators). In the second stage, the inner model was evaluated. This stage involved examining the inner-model fit; that is, assessing the model for collinearity issues and the predictive capabilities of the exogenous variables (i.e., the level
of $R^2$ and Stone-Geisser’s Q2 value) (Hair Jr et al., 2017b). The procedure and results of conducting the outer and inner-model analyses are presented in the following sections.

![Figure 6.8: Structural model](image)

**Notes:** EXPR = exploration capability, EXPIT = exploitation capability, AMBX = ambidexterity, Co Ag = company age, Co Sz = company size, Cus Inv = customer involvement, CusSop = customer sophistication, Cus Loc = customer location, InnPer = innovation performance.

In PLS-SEM, the strength of the relationships can be assessed by means of the standardised beta path coefficients, which were generated by running the PLS algorithm (Dijkstra, 2014; Dijkstra & Schermelleh-Engel, 2014). Further, the significance of the paths can be estimated in terms of t-values (empirical t-statistics values) or p-values (probability values) by running a bootstrap process (Hopkins, & Kuppelwieser, 2014). Bootstrapping is a non-parametric procedure that tests the statistical significance of PLS-SEM results. The bootstrapping procedure includes creating a bootstrap sample by using repeated random sampling with replacement from the original sample. The outcome of this procedure is an estimate of standard errors that are used for hypothesis testing (Henseler et al., 2009). This study applied PLS-SEM using Smart PLS v.3.19 (Sarstedt, Ringle, Smith, Reams, & Hair Jr, 2014) to analyse the data using the settings shown in Table 6.1.
<table>
<thead>
<tr>
<th>Table 6.11: Settings for running the Smart PLS 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLS analysis</strong></td>
</tr>
<tr>
<td><strong>Bootstrapping</strong></td>
</tr>
<tr>
<td><strong>Multiple group analysis (MGA)</strong></td>
</tr>
<tr>
<td><strong>Blindfolding</strong></td>
</tr>
</tbody>
</table>

### 6.5.1 Measurement model assessment (outer model analysis)

Evaluation of the measurement model involved separately examining the concepts of validity and reliability for the formative constructs (i.e., collinearity between indicators and significance and relevance of formative indicators).

#### 6.5.1.1 Collinearity test between indicators (outer)

Collinearity exists when two or more predictor variables are highly correlated with each other (Hair Jr, Sarstedt, Hopkins, & Kuppelwieser, 2014; Huck, 2012), which has a detrimental effect on the estimation of weights and statistical significance. To address the collinearity issue, Hair Jr et al. (2014) suggested that researchers examine the tolerance and VIF values in each set of predictor constructs separately for each subpart of the structural model.

Unlike reflective indicators, each of the formative indicators in the construct is supposed to provide a different piece of information (Bruhn, Georgi, & Hadwich, 2008; Diamantopoulos, Riefler, & Roth, 2008). The presence of collinearity in the outer model was evaluated by assessing the outer VIFs for each item. The threshold recommended for outer VIF values is below 5.00 (Sarstedt, Ringle, Smith, Reams, & Hair, 2014). The outer VIF results are presented in Table 6.2. As shown, all VIF values are lower than the threshold of 5.00.
Table 6.12: Outer VIF model results

<table>
<thead>
<tr>
<th>Construct</th>
<th>Formative</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXPLORATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXP_1</td>
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<td></td>
</tr>
<tr>
<td>EXP_2</td>
<td>1.588</td>
<td></td>
</tr>
<tr>
<td>EXP_3</td>
<td>1.53</td>
<td></td>
</tr>
<tr>
<td>EXP_4</td>
<td>1.67</td>
<td></td>
</tr>
<tr>
<td>EXP_5</td>
<td>1.373</td>
<td></td>
</tr>
<tr>
<td>EXP_6</td>
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</tr>
<tr>
<td><strong>EXPLOITATION</strong></td>
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<td>EXPI_1</td>
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<tr>
<td>EXPI_2</td>
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</tr>
<tr>
<td>EXPI_3</td>
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</tr>
<tr>
<td>EXPI_4</td>
<td>1.71</td>
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<tr>
<td>EXPI_5</td>
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</tr>
<tr>
<td>EXPI_6</td>
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<td></td>
</tr>
<tr>
<td>EXPI_7</td>
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<td></td>
</tr>
<tr>
<td><strong>CUSINVOLV</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUI-1</td>
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<td></td>
</tr>
<tr>
<td>CUI-2</td>
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<tr>
<td>CUI-3</td>
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<td>CUI-4</td>
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<tr>
<td>CUI-5</td>
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<td></td>
</tr>
<tr>
<td>CUI-6</td>
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<table>
<thead>
<tr>
<th>Construct</th>
<th>Formative</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUSOPHIS</td>
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</tr>
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<td></td>
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<td>CUS-3</td>
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<td>INNPER</td>
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<td></td>
<td>INN-4</td>
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<td></td>
<td>INN-5</td>
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<td></td>
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<td></td>
<td>INN-7</td>
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</tr>
<tr>
<td></td>
<td>INN-8</td>
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</tr>
<tr>
<td></td>
<td>INN-9</td>
<td>1.996</td>
</tr>
</tbody>
</table>

Notes: CUSINVOLV = customer involvement; CUSSOPHI = customer sophistication; INNPER = innovation performance

6.5.1.2 Significance and relevance of indicators

Another assessment criterion for formative constructs is evaluating the relevance and significance of formative indicators using their outer weights. Outer weights are the results of multiple regressions with formative indicators and their latent variable scores (Hair Jr et al., 2011). Outer weights of formative constructs are comparable with each other because they are standardised (Henseler, Ringle, & Sarstedt, 2016). They show the relative contribution of each indicator to each assigned construct (Hair Jr, Sarstedt, Ringle, & Mena, 2012).

A summary of outer weights and outer loadings of formative indicators and their significance is presented in Table 6.3. The results show that some of the outer weights’ p-values are not significant. According to the literature, non-significant outer weights should not be eliminated without considering the significance of their outer loadings (absolute contribution) to their associated constructs. When outer weights are insignificant but outer loadings are higher than 0.5 or significant, indicators are absolutely important, but not relatively important (Hair Jr, Sarstedt, Pieper, & Ringle, 2012).
Therefore, indicators with insignificant outer weights but significant outer loadings were retained. The results for the outer loadings of indicators with non-significant outer weights indicated that their outer loadings were significant. These measures were calculated in this research using SmartPLS 3 and the PLS bootstrapping procedure. Thus, all formative indicators were adequately measuring their constructs and were relatively or absolutely relevant to their associated constructs.

### Table 6.13: Outer weights and outer loading significance testing

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item/indicators</th>
<th>Weight</th>
<th>t-value</th>
<th>sig</th>
<th>outer t-value</th>
<th>sig</th>
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</thead>
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<td></td>
<td>EXP_1</td>
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<td></td>
<td>EXP_2</td>
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<td>0.72</td>
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<td></td>
<td>EXP_3</td>
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<td>EXP_4</td>
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<td>EXP_5</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>EXPI_1</td>
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<td>****</td>
<td>0.787</td>
<td>20.809</td>
</tr>
<tr>
<td></td>
<td>EXPI_2</td>
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<td>0.747</td>
<td>14.628</td>
</tr>
<tr>
<td></td>
<td>EXPI_3</td>
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<td>0.675</td>
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</tr>
<tr>
<td></td>
<td>EXPI_4</td>
<td>0.19</td>
<td>9.178</td>
<td>****</td>
<td>0.668</td>
<td>15.666</td>
</tr>
<tr>
<td></td>
<td>EXPI_5</td>
<td>0.212</td>
<td>9.704</td>
<td>****</td>
<td>0.722</td>
<td>14.56</td>
</tr>
<tr>
<td></td>
<td>EXPI_6</td>
<td>0.2</td>
<td>11.308</td>
<td>****</td>
<td>0.731</td>
<td>15.666</td>
</tr>
<tr>
<td>Exploitation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXPL_1</td>
<td>0.167</td>
<td>7.35</td>
<td>****</td>
<td>0.636</td>
<td>7.286</td>
</tr>
<tr>
<td></td>
<td>CUI-1</td>
<td>0.132</td>
<td>1.179</td>
<td>n.sig</td>
<td>0.625</td>
<td>3.482</td>
</tr>
<tr>
<td></td>
<td>CUI-2</td>
<td>0.264</td>
<td>3.257</td>
<td>****</td>
<td>0.687</td>
<td>8.481</td>
</tr>
<tr>
<td></td>
<td>CUI-3</td>
<td>0.207</td>
<td>2.366</td>
<td>***</td>
<td>0.751</td>
<td>6.575</td>
</tr>
<tr>
<td></td>
<td>CUI-4</td>
<td>0.263</td>
<td>3.615</td>
<td>****</td>
<td>0.675</td>
<td>8.218</td>
</tr>
<tr>
<td></td>
<td>CUI-5</td>
<td>0.186</td>
<td>2.038</td>
<td>***</td>
<td>0.693</td>
<td>6.381</td>
</tr>
<tr>
<td></td>
<td>CUI-6</td>
<td>0.312</td>
<td>3.032</td>
<td>****</td>
<td>0.82</td>
<td>12.506</td>
</tr>
<tr>
<td>Customer involvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CUS-1</td>
<td>0.134</td>
<td>0.611</td>
<td>n.sig</td>
<td>0.769</td>
<td>3.48</td>
</tr>
<tr>
<td></td>
<td>CUS-2</td>
<td>0.604</td>
<td>1.525</td>
<td>***</td>
<td>0.917</td>
<td>2.93</td>
</tr>
<tr>
<td></td>
<td>CUS-3</td>
<td>0.268</td>
<td>1.426</td>
<td>n.sig</td>
<td>0.754</td>
<td>3.37</td>
</tr>
<tr>
<td></td>
<td>CUS-4</td>
<td>0.183</td>
<td>0.984</td>
<td>n.sig</td>
<td>0.604</td>
<td>2.68</td>
</tr>
<tr>
<td></td>
<td>CUS-5</td>
<td>0.062</td>
<td>0.278</td>
<td>n.sig</td>
<td>0.584</td>
<td>2.12</td>
</tr>
<tr>
<td>Customer sophistication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INN-1</td>
<td>0.179</td>
<td>5.845</td>
<td>****</td>
<td>0.69</td>
<td>9.634</td>
</tr>
<tr>
<td></td>
<td>INN-2</td>
<td>0.139</td>
<td>4.907</td>
<td>****</td>
<td>0.752</td>
<td>13.295</td>
</tr>
<tr>
<td></td>
<td>INN-3</td>
<td>0.129</td>
<td>5.24</td>
<td>****</td>
<td>0.794</td>
<td>17.997</td>
</tr>
<tr>
<td></td>
<td>INN-4</td>
<td>0.101</td>
<td>3.175</td>
<td>****</td>
<td>0.676</td>
<td>8.068</td>
</tr>
<tr>
<td></td>
<td>INN-5</td>
<td>0.162</td>
<td>5.223</td>
<td>****</td>
<td>0.707</td>
<td>11.241</td>
</tr>
<tr>
<td></td>
<td>INN-6</td>
<td>0.13</td>
<td>2.841</td>
<td>****</td>
<td>0.627</td>
<td>4.557</td>
</tr>
<tr>
<td>Innovation performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INN-7</td>
<td>0.178</td>
<td>6.097</td>
<td>****</td>
<td>0.675</td>
<td>8.452</td>
</tr>
<tr>
<td></td>
<td>INN-8</td>
<td>0.196</td>
<td>7.901</td>
<td>****</td>
<td>0.779</td>
<td>13.219</td>
</tr>
<tr>
<td></td>
<td>INN-9</td>
<td>0.188</td>
<td>4.92</td>
<td>****</td>
<td>0.723</td>
<td>9.278</td>
</tr>
</tbody>
</table>

Notes: All tests are two-tailed, sig = significant, n.sig = none significant, **** significant at 0.001, *** significant at 0.01, ** significant at 0.05, * significant at 0.10.
6.5.2 Inner model analysis: model fit assessment

This section describes the assessment of the structural equation model to provide evidence for the model quality. Model fit was evaluated by means of model collinearity, the level of the $R^2$ and Stone–Geisser’s $Q^2$ values.

6.5.2.1 Collinearity test between indicators (inner)

As mentioned earlier, when two or more predictor variables are too highly correlated with each other, collinearity (or multicollinearity) exists (Hair Jr et al., 2014; Huck, 2012), which leads to an unreliable inferential result. To address the inner model collinearity issue, Hair Jr et al. (2014) suggested examining the VIF values in each set of predictor constructs separately for each subpart of the structural model. Hence, two sets of constructs are assessed for collinearity. As a rule, collinearity exists when the VIF exceeds 0.5. In such a case, Hair Jr et al. (2014) recommended that researchers remove constructs, merge predictors into a single construct or create higher-order constructs.

### Table 6.14: Inner VIF validity results

<table>
<thead>
<tr>
<th>Construct</th>
<th>AMBX</th>
<th>CUI</th>
<th>CUS</th>
<th>CUT</th>
<th>EXPI</th>
<th>EXP</th>
<th>INN</th>
<th>MCUI AMBX</th>
<th>MCUS AMBX</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMBX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.757</td>
<td></td>
</tr>
<tr>
<td>CUNINVOL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.496</td>
<td></td>
</tr>
<tr>
<td>CUSOPH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.428</td>
<td></td>
</tr>
<tr>
<td>CULocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.231</td>
<td></td>
</tr>
<tr>
<td>EXPI</td>
<td>1.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXP</td>
<td></td>
<td>1.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCUI AMBX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.608</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCUS AMBX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.886</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: AMBX = ambidexterity; EXP = exploration capability; EXPI = exploitation capability; CUI = customer involvement; CUS = customer sophistication; MCUI AMBX = moderating customer involvement on ambidexterity; INN = innovation performance.

To evaluate the inner model for collinearity issues between an endogenous construct and its associated predictor variables (exogenous constructs), Smart PLS 3 presents a report of the inner VIFs. The recommended threshold of inner VIF values is below 5.00 (Sarstedt, Ringle, Smith et al., 2014). The inner VIF results are presented in Table 6.4.
As shown, all values are lower than the threshold of 5.00. Therefore, it can be concluded that collinearity was not an issue between constructs in the model.

6.5.2.2 Coefficient of determination (R² value)

The level of R², the coefficient of determination, which tests the in-of-sample predictive accuracy of the model using the calculation of the squared correlation between the actual values of an endogenous construct and its predicted values, is the most common criterion for evaluating the inner model (Sarstedt, Ringle, Henseler, & Hair Jr, 2014). The range of R² value is between 0 and 1. The higher the value, the greater the level of the predictive accuracy (Sarstedt, Ringle, Smith et al., 2014). In the behavioural science domain, Cohen, Cohen, West and Aiken (2013) suggested that an R² value with 0.25 is broadly acceptable. Falk and Miller (1992) argued that an acceptable R² value depends on the complexity of the research model, and a minimum value of 0.10 is acceptable. Smart PLS 3 reports both R² and R² values. The results of both criteria are presented in Table 6.5.

Table 6.15: Level of R² and R² adjusted of endogenous constructs

<table>
<thead>
<tr>
<th>R²</th>
<th>R² adj.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation performance</td>
<td>0.32</td>
</tr>
</tbody>
</table>

6.5.2.3 Stone–Geisser’s Q² value

Another common criterion for evaluating the predictive accuracy of the PLS model is Stone–Geisser’s Q² value (Geisser, 1974; Stone, 1974), which tests the out-of-sample relevance predictive power of constructs. There are two methods for calculating the Q² values: cross-validated communality and cross-validated redundancy. The Q² value is only applied to reflective endogenous latent variables. Q² values higher than 0 indicate a satisfactory out-of-sample relevance predictive power of that particular construct (Hair Jr et al., 2011; Hair Jr, Ringle, & Sarstedt, 2013; Hair Jr et al., 2014; Hair Jr, Sarstedt, Ringle et al., 2012; Sarstedt, Ringle, Henseler et al., 2014; Sarstedt, Ringle, Smith et al., 2014; Sarstedt, Wileczynski, & Melewar, 2013). Smart PLS 3 runs a blindfolding procedure for endogenous constructs with reflective indicators and with single-item constructs to predict the Q² values. In this procedure, the omitted data points are treated as missing
values. Estimated values are then applied to estimate the omitted data points. The difference between the actual data point (omitted) and this estimation is used as an input for calculating the $Q^2$ values (Hair Jr et al., 2011; Hair Jr et al., 2017b).

In this study, the blindfolding procedure was conducted using the calculating construct cross-validated redundancy as recommended in the literature (Hair Jr et al., 2011; Sarstedt, Ringle, Smith, Reams, & Hair, 2014). An omission distance value of between 5 and 10 is recommended in the literature (Hair Jr et al., 2011; Hair Jr, Sarstedt, Ringle et al., 2012), with the value of 10 used in this study. The $Q^2$ results are presented in Table 6.6. All values of $Q^2$ are above the recommended 0 threshold; therefore, we can conclude that the model presents predictive relevance for the endogenous constructs.

### Table 6.16: Results of Stone–Geisser’s $Q^2$ values

<table>
<thead>
<tr>
<th>Construct</th>
<th>SSO</th>
<th>SSE</th>
<th>$Q^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMBX</td>
<td>1,053</td>
<td>620.622</td>
<td>0.412</td>
</tr>
<tr>
<td>INN PER</td>
<td>729</td>
<td>639.328</td>
<td>0.124</td>
</tr>
</tbody>
</table>

Notes: SSO = sum of the squared observations; SSE = sum of the squared prediction errors, $Q^2 = 1 - \frac{SSE}{SSO}$

#### 6.5.2.4 Structural model path coefficients

To test the hypotheses, the strength of the relationships (path coefficients) and their significance (p-values) were calculated using the PLS algorithm and a 5,000-sample bootstrapping procedure. In addition, for testing a moderating relationship, PLS-MGA (multiple group analysis), recommended by Chin (2004), was used.

Path coefficients, representing the hypothesised relationships among constructs, are obtained. According to Hair Jr et al. (2014), the estimated path coefficient is a standardised value ranging from $-1$ to $+1$. When the value is close to $+1$, it represents a strong positive relationship, and vice versa for negative values (Hair Jr et al., 2014). Moreover, the closer the values are to 0, the weaker the relationship.

To test the hypotheses, the strength of the relationships (path coefficients) and their significance (p-values) were calculated using a bootstrapping procedure on 5,000 samples. The overall model results are presented in Table 6.7.
Table 6.17: SEM results

<table>
<thead>
<tr>
<th>Path</th>
<th>Coefficient</th>
<th>Std dev.</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambidexterity → innovation</td>
<td>0.362***</td>
<td>0.132</td>
<td>2.75</td>
</tr>
<tr>
<td>Customer sophistication → innovation</td>
<td>-0.18</td>
<td>0.228</td>
<td>0.79</td>
</tr>
<tr>
<td>Customer involvement → innovation</td>
<td>0.356***</td>
<td>0.148</td>
<td>2.41</td>
</tr>
<tr>
<td>Ambidexterity × customer sophistication → innovation</td>
<td>-0.189</td>
<td>0.238</td>
<td>0.8</td>
</tr>
<tr>
<td>Ambidexterity × customer involvement → innovation</td>
<td>0.291*</td>
<td>0.239</td>
<td>1.21</td>
</tr>
<tr>
<td>Customer location → innovation</td>
<td>-0.056</td>
<td>0.132</td>
<td>0.42</td>
</tr>
<tr>
<td>Firm age → innovation</td>
<td>0.051</td>
<td>0.146</td>
<td>0.35</td>
</tr>
<tr>
<td>Firm size → innovation</td>
<td>-0.255**</td>
<td>0.133</td>
<td>1.92</td>
</tr>
<tr>
<td>R²</td>
<td>0.319</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *** p < 0.01, ** p < 0.05, *p < 0.10.

6.6 Hypotheses Testing

The subsequent sections provide the results of the hypotheses testing for both the direct effect and moderating role of customer characteristics on innovation performance. The following hypotheses from Chapter 3 were tested:

*Hypothesis 3: The level of ambidextrous learning capabilities of OSPs is positively related to their innovation performance.*

*Hypothesis 7: Customer involvement positively moderates the relationship between ambidexterity and the innovation performance of OSPs.*

*Hypothesis 8: Customer sophistication positively moderates the relationship between ambidexterity and the innovation performance of OSPs.*

6.6.1 Direct and moderating relationships

The results of the research model (see Table 6.7) revealed no statistically significant effect on innovation performance for the control variables of company age (β = 0.051; n.s.), but displayed a statistically significant and negative effect of company size (β = -0.255; p ≤ 0.05), suggesting that, on average, smaller service providers are more likely to
achieve higher innovation performance. The results revealed no statistically significant effect of customer location (β = −0.06; n.s.); thus, Hypothesis 6 was not supported. Consistent with prior research on organisational learning capability, ambidexterity showed a significant and positive effect on innovation performance (β = 0.362, p ≤ 0.01), supporting Hypothesis 3, that the level of ambidextrous learning capabilities of OSPs is positively related to their innovation performance.

6.6.2 Multiple group analysis

PLS-MGA, which is a non-parametric approach based on the bootstrapping results (Hair Jr et al., 2017b; Henseler, 2012), was used to assess the effect of different groups of customers on innovation performance. In this approach, the sample responses were first categorised as being low or high with respect to level of customer involvement for the group of highly involved consumers and for the group of consumers with low involvement (low v. high, which represents passive and active customers respectively), customer sophistication (low v. high, which represents average and lead customers) and customer location (zero v. one, which represents onshore and offshore customers). The posited model was then run for each group, with the difference in paths between the two groups being tested. The multi-group comparison was performed to assess whether the group-specific path coefficients differed significantly. The results of the two-group PLS analysis (presented in Table 5.7) showed that the paths differed significantly between different customer characteristics.

In this approach, each data point was first classified as being low or high with respect to the level of customer involvement: active customers (Group I-1) and passive customers (Group I-2). I also classified each data point into two groups based on their level of customer sophistication: lead users (Group S-1) and average users (Group S-2). I then ran the PLS-MGA for each group to examine differences in path coefficients between customer groups. The results of the PLS-MGA for different levels of customer involvement and sophistication and the significance of the differences between the two subgroups’ paths are shown in Table 6.8 and Table 6.9.

First, the PLS-MGA results for different levels of customer involvement (see Table 6.8) showed that the effect of ambidexterity on innovation performance differed significantly between active users and passive users (β = 0.69; p < 0.05). The results showed that the
effect of ambidexterity on innovation performance was significantly stronger for active users (Group I-1) than for passive users (Group I-2). ($\beta = 0.87; p < 0.01$), providing support for Hypothesis 7, which is consistent with the finding of a significant three-way interaction between exploration, exploitation and customer involvement in Study 1.

Table 6.18: Multiple group analysis for customer involvement

<table>
<thead>
<tr>
<th>Path</th>
<th>Active v. passive customers</th>
<th>Active customers</th>
<th>Passive customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambidexterity → innovation</td>
<td>0.69***</td>
<td>0.87***</td>
<td>(4.13)</td>
</tr>
<tr>
<td>Customer involvement → innovation</td>
<td>0.31</td>
<td>-0.11</td>
<td>(0.74)</td>
</tr>
<tr>
<td>Ambidexterity × customer involvement → innovation</td>
<td>0.49</td>
<td>0.01</td>
<td>(0.36)</td>
</tr>
<tr>
<td>Customer location → innovation</td>
<td>0.03</td>
<td>0.12</td>
<td>(0.725)</td>
</tr>
<tr>
<td>Firm age → innovation</td>
<td>0.25</td>
<td>-0.09</td>
<td>(0.96)</td>
</tr>
<tr>
<td>Firm size → innovation</td>
<td>0.55***</td>
<td>0.43***</td>
<td>(2.4)</td>
</tr>
</tbody>
</table>

Notes: t-values in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Second, the PLS-MGA results also showed that there was a significant difference in the path coefficients of ambidexterity on innovation performance ($\beta = 0.381; p < 0.10$) between lead versus average users. The results further showed that ambidexterity of OSPs had a highly significant and positive role among lead users (Group S-1) compared with average users (Group S-2) ($\beta = 0.49, p < 0.01$), providing support for Hypothesis 8, which is consistent with the finding of a significant three-way interaction between exploration, exploitation and customer sophistication in Study 1.

Further, the multi-group analysis shows that there was a significant difference in the path coefficients of customer involvement on innovation performance ($\beta = 0.64; p < 0.10$) between lead versus average users. The results showed a positive relationship between customer involvement and innovation performance when those involved customers were also more sophisticated users ($\beta = 0.395; p < 0.01$).

Finally, offshore customers who were lead users had a significant effect on innovation performance, whereas there was no significant effect on the innovation performance of
average offshore customers. Therefore, the results showed that only sophisticated offshore customers affected the innovation performance of OSPs significantly.

The PLS-MGA results for different levels of customer innovation (see Table 6.9) showed that there was a significant difference in the path coefficients of customer location on innovation performance ($\beta = 0.49; p < 0.01$) between lead versus average users. The results showed that onshore customers had a significant effect on OSP innovation performance only when they were also lead users, whereas there was no significant effect on innovation performance in the group of average users ($\beta = -0.28; p < 0.05$).

<table>
<thead>
<tr>
<th>Path</th>
<th>Lead v. average users</th>
<th>Lead users</th>
<th>Average users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambidexterity $\rightarrow$ innovation</td>
<td>0.381*</td>
<td>0.49*** (2.72)</td>
<td>0.063 (0.63)</td>
</tr>
<tr>
<td>Customer involvement $\rightarrow$ innovation</td>
<td>0.648*</td>
<td>0.395*** (2.23)</td>
<td>-0.051 (0.66)</td>
</tr>
<tr>
<td>Ambidexterity $\times$ customer involvement $\rightarrow$ innovation</td>
<td>0.339</td>
<td>0.145 (0.44)</td>
<td>-0.184 (1.01)</td>
</tr>
<tr>
<td>Customer location $\rightarrow$ innovation</td>
<td>0.493***</td>
<td>-0.283** (1.91)</td>
<td>0.168 (1.07)</td>
</tr>
<tr>
<td>Firm age $\rightarrow$ innovation</td>
<td>0.256</td>
<td>0.308** (1.73)</td>
<td>0.1 (0.4)</td>
</tr>
<tr>
<td>Firm size $\rightarrow$ innovation</td>
<td>0.229</td>
<td>-0.097 (0.56)</td>
<td>0.349** (1.94)</td>
</tr>
</tbody>
</table>

Notes: t-values in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

The results of this study showed that not only does the ambidexterity capability of OSPs have a significant effect on the innovation performance, but the level of customers’ involvement also matters and augments the effect of ambidexterity on innovation performance. It supports previous studies that found that interactions between service providers and their customers generate exposure to each other’s knowledge (Perri & Andersson, 2014; Peteraf & Shanley, 1997) and can help service providers to make productive use of such knowledge (Kotabe et al., 2003). This is also consistent with previous studies of organisational learning that have shown the importance of ambidexterity in maintaining innovation and long-term performance in knowledge-intensive firms (Benner & Tushman, 2003; Gibson & Birkinshaw, 2004; March, 1991; Tushman & O’Reilly, 1996).
While prior research has focused on investigating the direct effects of customer involvement on firms’ innovation performance, I assessed its possible moderating effect and found that the level of customer involvement had a positive effect on the relationship between ambidexterity and innovation performance. Hence, a significant finding emerging from this research is that knowledge acquired from highly involved customers can augment the innovation performance if it is accompanied by an ambidextrous learning capability. Thus, this study supports previous literature by confirming the positive and significant role of having both involved customers and ambidextrous learning capability in augmenting innovativeness in firms.

Although the direct effect of customer sophistication on the innovation performance of OSPs was not significant in the model with the whole sample, the results of the multigroup analysis showed that ambidexterity had a significant effect on innovation performance in projects with lead users.

The findings are consistent with the literature on lead users, suggesting that working with leads users results in increased innovation of a firm (Jeppesen & Laursen, 2009; Thomke & von Hippel, 2002; von Hippel, 1986). They also highlight the importance of the supplier firm having ambidextrous learning capabilities to capitalise on their input.

Becoming involved with onshore customers can facilitate knowledge exchange and thus favour a more interactive approach to learning and innovation for service providers. This supports other studies that found that knowledge exchange is more difficult at a distance, while proximity in providing outsourcing services facilitates personal contacts (Love & Roper, 2001) and is more likely to facilitate transferring knowledge and in turn enhancing innovation (Cusmano, Mancusi, & Morrison, 2009).

Table 6.10 summarises the results of the hypothesis testing.
<table>
<thead>
<tr>
<th>Direct effect on Innovation performance</th>
<th>Study 1 (OLS)</th>
<th>Hypotheses</th>
<th>Study 2 (PLS)</th>
<th>Hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Exploration capability</td>
<td>H₁ Supported</td>
<td></td>
<td>• Ambidexterity</td>
<td>H₃ Supported</td>
</tr>
<tr>
<td>• Exploitation capability</td>
<td>H₂ Not-Supported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ambidexterity</td>
<td>H₃ Not-Supported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Customer Involvement</td>
<td>H₄ Supported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Customer sophistication</td>
<td>H₅ Not-Supported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Customer location</td>
<td>H₆ Not-Supported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction effects on Innovation performance</td>
<td></td>
<td></td>
<td>• Highly involved customers (active users) × Ambidexterity</td>
<td>H₇ Supported</td>
</tr>
<tr>
<td>• Customer Involvement × Exploration capability × Exploitation capability</td>
<td>H₇ Supported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Customer sophistication × Exploration capability × Exploitation capability</td>
<td>H₈ Supported</td>
<td></td>
<td>• Highly sophisticated customers (lead users) × Ambidexterity</td>
<td>H₈ Supported</td>
</tr>
</tbody>
</table>
6.7 Chapter Summary

The purpose of Study 2 was to test the hypotheses to explain the relationships between OSPs’ learning capabilities and customer characteristics and innovation performance, as well as the moderating role of customer characteristics using PLS-SEM, which allows the constructs to be modelled as latent variables and ambidexterity to be modelled as a higher-order construct of exploration and exploitation capabilities.

This study contributes to prior literature regarding the importance of customer participation in enhancing innovation performance, viewing them as a common source of innovation and incorporating them into new product or service development that can be beneficial for a company’s innovation performance. The findings of this study showed that highly involved customers are an effective element in improving innovativeness in OSPs when combined with a high ambidexterity capability on the part of OSPs. The findings also supported the role of lead users in innovation concepts (Jeppesen & Laursen, 2009; Thomke & von Hippel, 2002; von Hippel, 1986), but highlighted the importance of OSPs having ambidextrous learning capabilities to capitalise on customer knowledge.
Chapter 7: Configurational Study of Highly Innovative Outsourcing Service Providers

7.1 Introduction

The results of the two previous studies using multiple regression and PLS-SEM showed that the interaction between service providers’ learning capabilities and customer characteristics affected their innovation performance. However, both multiple regression and SEM suffer from a number of weaknesses because they focus exclusively on the net effect of variables in explaining the variation in outcomes and do not capture how the various combinations of these variables lead to the outcomes.

By focusing on the relative importance of rival variables and on the net effect of a variable while holding constant the values of all other variables in the equation, both multiple regression and PLS-SEM have difficulties in examining the effects of combinations of variables. This is particularly problematic when organisational outcomes depend on combinations or configurations of organisational and environmental factors, as has been suggested by some management scholars (Fiss, 2011; Kan, Adegbite, El Omari, & Abdellatif, 2016). Hence, the aim of Study 3 was to determine the different combinations (configurations) of variables that determine OSPs’ innovation performance, and fsQCA is an appropriate technique to fulfil this aim.

The first section of this chapter presents an overview of QCA and fsQCA. The next section presents the advantages of using this method over conventional statistical techniques. Then, the analyses and results of this study are presented and discussed. Finally, the conclusion of this chapter is presented.

7.2 Qualitative Comparative Analysis

QCA is a method developed by Charles C. Ragin in 1987 to bridge qualitative and quantitative analysis and provide powerful tools for the analysis of causal complexity (Ragin, 2013). QCA uses Boolean algebra to implement principles of comparison used by scholars engaged in the qualitative study of social phenomena. Typically, qualitatively oriented scholars examine only a few cases at a time, but their analyses are both intensive
(i.e., addressing many aspects of cases) and integrative (i.e., examining how the different parts of a case fit together, both contextually and historically).

By formalising the logic of qualitative analysis, QCA makes it possible to bring the logic and empirical intensity of qualitative approaches to studies that embrace more than a handful of cases—research situations that normally call for the use of variable-oriented and quantitative methods. Boolean methods of logical comparison represent each case as a combination of causal and outcome conditions. These combinations can be compared with each other and then logically simplified through a bottom-up process of paired comparison (Ragin & Alexandrovnna Sedziaka, 2013).

Hence, the basic intuition underlying QCA is that cases are best understood as configurations of attributes resembling overall types, and that a comparison of cases can allow a researcher to strip away attributes that are unrelated to the outcome in question (Fiss, 2011).

The notion of organisational configuration, defined as any multidimensional constellation of conceptually distinct characteristics that commonly occur together (Meyer, Tsui, & Hinings, 1993), is arguably one of the central ideas of organisation studies (e.g., Bensaou & Venkatraman, 1995; Dess & Davis, 1984; Doty & Glick, 1994; Miller, 1986). A configurational approach suggests that organisations are best understood as clusters of interconnected structures and practices rather than as modular or loosely coupled entities whose components can be understood in isolation. QCA is uniquely suitable for analysing causal processes because it is based on a configurational understanding of how causes combine to bring about outcomes and because it can handle significant levels of causal complexity (Fiss, 2007; Ragin, 2000, 2008).

**7.2.1 Advantages of the qualitative comparative analyses method**

QCA presents several advantages relative to most traditional statistical techniques. Conventional correlational methods tend to rely on the principles of linearity, additive effects and unifinality (Fiss, 2007). In regression-based techniques such as SEM, independent variables are treated as competing in explaining the dependent variable, rather than showing how variables combine to create outcomes. By focusing on the unique contribution of variables, while holding constant all other variables, a correlational approach has difficulty in treating cases as configurations and examining combinations
of variables (Fiss, 2007). Thus, correlational approaches fail to identify the specific conditions under which a variable may influence an outcome of interest. Moreover, QCA does not consider some other basic assumptions that underlie most statistical techniques: permanent causality, uniformity of causal effects, unit homogeneity, additivity and causal symmetry (Rihoux & Ragin, 2008).

One of the great advantages of this method is the admission of equifinality—that is, recognising that ‘different equally effective configurations of conditions may lead or contribute to the same outcome’ (Fiss, Cambré, & Marx, 2013; Gonçalves, Lourenço, & Silva, 2016; Meneses et al., 2016). While unifinality assumes that there exists one optimal configuration, equifinality assumes that two or more organisational configurations can be equally effective in achieving high performance, even if they are faced with the same contingencies (Galunic & Eisenhardt, 1994; Gresov & Drazin, 1997). This implies the need for a conception of causality that allows for complexity (Ragin, 1989, 2008).

Further, QCA has the ability to unravel complex causal structures such as multifinality, conjunctural causation and asymmetric causality (Basedau & Richter, 2014). Multifinality reflects the phenomenon whereby identical conditions may lead or contribute to a different outcome. Whereas conjunctural causation reflects the idea that causal configurations of conditions can be jointly either necessary or sufficient to achieve the outcome through their constituents’ conditions. Asymmetric causality means that the explanation for the outcome is not the logical opposite of the explanation for the absence of the outcome (Basedau & Richter, 2014; Rihoux & Ragin, 2008).

### 7.2.2 Fuzzy set qualitative comparative analysis

Ragin (2000) introduced fsQCA as an improvement to the QCA method, in which the membership of the variables in the cases studied is allowed to be fuzzy instead of being a crisp boundary. A crisp (or conventional) set is dichotomous: a case is either ‘in’ or ‘out’ of a set. Thus, a crisp set is comparable to a binary variable with two values, 1 (i.e., ‘in’) and 0 (i.e., ‘out’). In contrast, a fuzzy set permits membership in the interval between 0 and 1 while retaining the two qualitative states of full membership and full non-membership.

This improvement enables social science researchers to study the relationship between combinations of continuous variables derived from their fuzzy phenomena. Hence,
fsQCA is used in this study to explore how causal conditions jointly (as configurations) link to higher innovation performance (outcome of interest). This study used the Stata routine ‘fuzzy’ to conduct the analysis (Longest & Vaisey, 2008).

7.2.3 Data calibration procedure

In fsQCA, conventional variables need to be transformed to dichotomous sets ranging between 0 and 1, where 0 indicates non-membership of the variable and 1 indicates full membership of the variable. To meet this requirement, all variables need to be calibrated. This was done using the setgen function in Stata 14 to create standardised ranks. This transforms the original responses on a continuous scale to an interval ranging from 0 to 1. In cases where values are tied, values are allocated to preserve the rank-sum order. The ranks are then standardised by subtracting the minimum rank and dividing the result by the difference between the maximum and minimum rank (Parida, Patel, Frishammar, & Wincent, 2017). The resulting standardised rank-order values range from 0 to 1.

7.3 Analyses and Results

I applied fsQCA using the same dataset used for the regression analysis and PLS-SEM, obtained from the international population of OSPs plus an additional variable: OSP and customer collocation coded as a dichotomous variable representing whether or not a service provider and customer are in the same geographical region. To do so, four different regions were defined geographically according to the service provider’s headquarters and its customer’s headquarters, including America (North America, Latin America and the Caribbean), Europe, Asia, and Oceania and others. Three different models were tested using fsQCA.

The consistency score and solution coverage measures suggested by Ragin (2006) were adopted in this study to evaluate the solutions. Consistency measures the degree to which a subset relation has been approximated. It resembles the notion of significance in statistical models (Schneider & Wagemann, 2010). A consistency score of 1 indicates that the combination of causal conditions meets the rule across all cases. The more cases that fail to meet the consistency criterion and the larger the distance from meeting the criterion, the further the consistency score will fall below 1.
In contrast, solution coverage assesses the empirical relevance of a consistent subset, an analogous measure of $R^2$ in regression analysis (Korjani & Mendel, 2012; Ragin, 2006). The analysis of necessary conditions is the determination of any of the causal conditions that can be considered necessary for the outcome. Consistency measures the degree that a particular rule or outcome is affiliated in each case; thus, a high consistency suggests that more cases meet this rule. According to Fiss (2007) and Ragin (2006), the absence or presence of a condition is considered necessary for the outcome if the consistency score is more than 0.9.

### 7.3.1 Model 1

The first model (see Table 7.1) presents the results of Model 1, which includes four key variables: exploration capability, exploitation capability, customer involvement and customer sophistication. This study adopts the notation for solution tables, which was introduced by Ragin and Fiss (2008), with a slight modification to make the presentation of the results easier to understand. More specifically, black circles ‘●’ indicate core conditions (the presence of a condition) and white circles ‘○’ indicate peripheral conditions (the absence of a condition). Blank spaces in a solution indicate a ‘don’t care’ situation, in which the causal condition may be either present or absent.

The analysis shows one configuration leading to high innovation performance of OSPs with high overall consistency (0.849) and coverage (0.552), suggesting that the configuration covers a reasonably large proportion of OSPs with high innovation performance. In line with prior studies, the results from the baseline model (Model 1) show that the presence of exploration and exploitation capabilities, customer involvement and customer sophistication is required in the configuration of highly innovative OSPs.

### Table 7.20: Solution table indicating configurations of four key variables (Model 1)

<table>
<thead>
<tr>
<th>Service providers’ capabilities</th>
<th>Solution 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>High exploration capability</td>
<td>●</td>
</tr>
<tr>
<td>High exploitation capability</td>
<td>●</td>
</tr>
<tr>
<td>Customer characteristics</td>
<td></td>
</tr>
<tr>
<td>High customer involvement</td>
<td>●</td>
</tr>
<tr>
<td>High customer sophistication</td>
<td>●</td>
</tr>
</tbody>
</table>
7.3.2 Model 2

As Model 1 only uncovered one solution, further models were tested including other variables. Model 2 included exploration and exploitation capabilities, customer involvement, customer sophistication, customer location (onshore v. offshore), company age, company size and service providers’ headquarters/customer region as the causal conditions for OSPs’ innovation performance. Two solutions were found in Model 2. In both solutions, both the exploration and exploitation learning capabilities of service providers were present as core conditions, reinforcing the findings of Model 1. This finding suggests that high levels of innovation performance were associated with service providers’ learning capabilities and their level of customer sophistication and involvement. Moreover, the consistency scores for the solution in this model were above the recommended minimum value of 0.75, so these causal conditions were sufficient for higher innovation performance (Ragin & Fiss, 2008).

The results in Model 2 showed that two configurations led to high innovation performance (see Table 7.2). The presence of high exploration and exploitation capability were core conditions for achieving high innovation performance in both configurations. The results showed that the presence of high customer involvement and customer sophistication and the absence of offshore customer location and high company age are required for high innovation performance of OSPs.

The presence of collocating with customers is also necessary for both configurations to lead to highly innovative OSPs. Hence, the analysis produced the following conclusions:

- Exploration and exploitation capabilities are core conditions for high innovation performance of OSPs.
- In the absence of offshore customer location and high company age (i.e., newly established service providers with onshore customers), the presence of customer involvement and customer sophistication are required.
- Collocation of OSPs and customers’ headquarters is a core condition for OSPs to achieve high innovation performance.
Table 7.21: Solutions table indicating configurations of all variables (Model 2.1 and Model 2.2)

<table>
<thead>
<tr>
<th>Solutions</th>
<th>2.1</th>
<th>2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>High exploration capability</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>High exploitation capability</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>High customer involvement</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>High customer sophistication</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>Offshore customer</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Large company size</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>High company age</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Collocation with customer</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coverage</th>
<th>2.1</th>
<th>2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw coverage</td>
<td>0.136</td>
<td>0.173</td>
</tr>
<tr>
<td>Unique coverage</td>
<td>0.054</td>
<td>0.091</td>
</tr>
<tr>
<td>Solution consistency</td>
<td>0.981</td>
<td>0.973</td>
</tr>
<tr>
<td>Overall solution consistency</td>
<td></td>
<td>0.928</td>
</tr>
<tr>
<td>Total coverage</td>
<td></td>
<td>0.329</td>
</tr>
</tbody>
</table>

7.3.3 Model 3.1

Model 3.1 includes the same set of variables as Model 2, but it aims to examine the differences between the high performing configurations of OSPs that are collocated in the same region as their customers and those that are not collocated. Hence, firms in the sample are classified into two subsamples containing OSPs whose headquarters are in the same regions as their customers’ headquarters (Model 3.1) and those whose headquarters are located in a different region from their customers’ headquarters (Model 3.2).

For Model 3.1, the solutions are presented in Table 6.3. This shows the existence of two solutions leading to a high level of innovation performance in OSPs.

For solution 3.1.1, which applies to small- and medium-sized OSPs (indicated by the absence of large company size), exploration and exploitation capabilities and collocation with customer are essential conditions. Thus, a service provider with these capabilities
has a special advantage in new service development and enhancing its innovation performance.

For solution 3.1.2, which applies to large OSPs, in addition to exploration and exploitation capabilities, service providers need sophisticated and involved customers to be highly innovative. This finding suggests that sophisticated and involved customers can compensate for the organisational inertia of large OSPs.

Table 7.22: Solutions table for Section 1, headquarter/customer in the same region
(Model 3.1.1 and Model 3.1.2)

<table>
<thead>
<tr>
<th>Solutions</th>
<th>3.1.1</th>
<th>3.1.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>High exploration capability</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>High exploitation capability</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>High customer involvement</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>High customer sophistication</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>Offshore customer</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Large company size</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>High company age</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Collocation with customer</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

Since these two solutions have a distinctive combination of conditions, they reflect what Fiss (2011) termed as equifinality. The fsQCA analysis revealed that exploration and exploitation capabilities were two core conditions for both configurations (solutions), whatever the characteristics of customers and service provider companies. OSPs’ internal capabilities in finding new opportunities and also the refining of existing competencies invariably had a strong causal relationship with innovation performance. Compared with
solution 3.1.1, the raw coverage score for solution 3.1.2 was relatively high, implying the greater empirical importance of this configuration.

Further, according to Fiss (2007) and Ragin (2006), the absence or presence of a condition is considered necessary for the outcome if the consistency score is more than 0.9, which is true for both solutions of Model 3.1. The presence of collocation in both solutions is in line with prior research in knowledge transfer, which suggests that knowledge transfer between OSPs and their customers is more efficient when they are close in proximity. In fact, research shows that geographical proximity can increase the opportunity for a more interactive approach in learning and innovation (Love & Roper, 2001; Morgan, 2007) and facilitate transferring knowledge, thereby enhancing innovation (Cusmano et al., 2009).

7.3.4 Model 3.2

For the second subgroup of firms (i.e., those whose headquarters are located in a different region from their customers’ headquarters [Model 3.2]), no sets were identified as true. This shows that for the second subsample, no configuration led to the higher innovation performance of such OSPs. The results support previous studies that have shown that geographic distance between service providers and customers is a factor that needs to be considered, because distance creates difficulties for communication (Chen & Lin, 2016), which may obstruct transferring knowledge among customers and service providers.

The results are also in line with previous studies showing that geographical proximity—referring to the spatial vicinity of organisations’ physical locations (Balland, Boschma, & Frenken, 2015)—can influence the probability of organisations establishing a knowledge link and exchanging knowledge (Balland, 2012; Breschi & Lissoni, 2003).

According to Boschma (2005), geographical proximity may affect firms’ likelihood to engage in knowledge exchange with other organisations. In fact, being geographically close allows better communication between organisations because it delivers better opportunities to interact. It not only facilitates knowledge exchange, but also defines the learning potential for the creation of novel ideas and solutions (Broekel & Boschma, 2017). Hence, service provider headquarters/customer regional proximity can act as an enabling factor of knowledge exchange between service providers and customers, thereby creating novel ideas and fostering innovation performance.
This study investigated the various combinations of OSPs’ learning capabilities and customer characteristics leading to high OSPs’ innovation using the configuration approach. The fsQCA technique was used in this chapter to explore how different configurations of causal conditions jointly linked to the outcome of interest (Fiss, 2011).

fsQCA is an appropriate method for this study because of its ability to model complex causation whereby the outcome does not depend on a single causal condition, but rather a combination of conditions. Consequently, this method showed how learning capabilities of service providers and customer characteristics (causal conditions) combine in different ways to produce high innovation performance (outcome).

The results of this study revealed that exploration and exploitation capabilities, customer involvement and customer sophistication are all required in highly innovative OSPs. The findings confirmed the findings of Study 1 and Study 2, that high levels of innovation performance are associated with service providers’ learning capabilities and the level of customer sophistication and involvement, and it also highlights the importance of OSP–customer collocation.
Chapter 8: Conclusions and Implications of This Research

8.1 Introduction

This research was undertaken to investigate the role of customers as an external source of knowledge together with internal learning capabilities of OSPs in fostering innovation performance.

It was argued that OSPs are likely to be exposed to a wide range of knowledge sources through their engagement with global customers, some of whom have a high level of sophistication and involvement in the innovation process. Being in such a central position allows OSPs to use this external knowledge to enhance their innovation. More specifically, OSPs not only benefit from access to external sources of knowledge in their relationship with clients, but also from a recombination and reapplication of knowledge across clients.

8.2 Major Research Findings

OSPs face a unique set of challenges in providing services to clients. Service providers have to attempt to use their resources and capabilities in the most appropriate way to meet the determined performance metrics agreed in contracts with their clients. One of the main objectives of a service provider is to add value to the efficiency of the client firm’s resources. To do so, suppliers of these services need to regularly enhance their capabilities to meet their clients’ needs and to be able to obtain new contracts for service provision to new customers.

However, studies have increasingly suggested that many firms with a high level of learning capabilities fail to deliver innovation and remain competitive in the fast-changing market, implying that innovation requires more than just internal learning capabilities. Moreover, companies are increasingly shifting their boundaries from closed to open innovation (Gummesson, Mele, Polese, Russo-Spena, & Mele, 2012) and initiating their innovation activities through inbound and outbound open innovation processes (Chesbrough, 2006; Veugelers, Bury, & Viaene, 2010). In the past decade, scholars have enriched innovation studies with new ideas that mainly concern the involvement of customers (Prahalad & Krishnan, 2008; Prahalad & Ramaswamy, 2003;
Sawhney, Verona, & Prandelli, 2005; von Hippel, 2005). These studies suggest that product and service providers should also involve their customers in various phases of their innovation processes.

Therefore, this thesis suggests that OSPs need both specific learning capabilities and customers’ knowledge to successfully innovate. The implications of collaborative innovation with customers are substantial because there has been a paradigm shift (Greer & Lei, 2012). Firms increasingly learn from external sources such as their suppliers and customers. Advances in technologies also steer us towards more collaborative and more open forms of innovation (Chesbrough, 2003; Chesbrough & Appleyard, 2007; Lichtenthaler, 2008; Prandelli, Verona, & Raccagni, 2006). Customers may take different roles in the innovation process, and they can be active idea generators (Paasi et al., 2014). Hence, firms that are working closely with customers and suppliers are able to obtain new insights and knowledge (Prahalad & Ramaswamy, 2000; Skaggs & Youndt, 2004).

This research argues that one of the key contributing factors to the innovative performance of OSPs is the transfer of knowledge from clients to providers and suggests that OPSs need specific learning capabilities to take advantage of the knowledge residing in their customers and to adapt this knowledge to develop internal ideas and solutions that can be used in introducing new services and processes. The studies investigated which factors contribute to increasing OSPs’ innovation performance.

Heterogeneity of knowledge inputs is a key source of innovation (Leiponen & Helfat, 2011; Nelson & Winter, 1982; Rodan & Galunic, 2004). OSPs can also foster their innovation performance by engaging with their customers to benefit from knowledge heterogeneity that can be adapted from different types of customers. Further, it has been shown in previous research in innovation management that the most advanced or lead users frequently play the most important role in the development of new products and services (Lüthje & Herstatt, 2004).

The results of Study 1 confirmed that customer sophistication and customer involvement have significant and positive effects on innovation performance. Second, the results showed the importance of having both exploratory learning and exploitative learning capabilities (i.e., ambidextrous learning capabilities) in innovation performance.
In addition, the results showed not only that customer characteristics and organisational learning capabilities matter in themselves, but that the effects of customer characteristics, exploration and exploitation learning capabilities are contingent on each other. Hence, there is a significant and positive three-way interaction of high exploration, high exploitation and high customer involvement or customer sophistication. That is, OSPs that are high in all three areas tend to perform better than firms that are high in only one or two areas. These results suggest that combining ambidextrous learning capabilities with a process of knowledge acquisition from customers, as an external source, can generate new ideas, leading to innovativeness for service providers.

The results of the multi-group analysis in Study 2 showed that the relationship between ambidexterity and innovation performance is stronger in the subgroup of lead users (i.e., sophisticated users) compared with average users. Further, the effect of ambidexterity on innovation performance is considerably stronger for active users than for passive users. This implies that not all customers can contribute to boosting the innovation performance of OSPs. OSPs need to recognise and focus on lead users and highly involved customers to enhance their level of innovativeness.

The fsQCA analysis conducted in Study 3 also contributed to the literature by providing an analytical insight into the configurational nature of OSPs’ innovation performance. Study 3 found that high levels of innovation performance are associated with service providers’ learning capabilities and the level of customer sophistication and involvement, which was also found in Study 1 and Study 2. However, Study 3 also showed the importance of collocating the OSPs’ and customers’ headquarters. The study also highlighted the advantage of customers being onshore and OSPs being relatively young and small, contrary to some expectations that larger and older firms might contribute more to innovation (Koberg, Uhlenbruck, & Sarason, 1996; Sørensen & Stuart, 2000).

Table 8.1 shows the objectives and findings of the three studies.
<table>
<thead>
<tr>
<th>Study focus</th>
<th>Key research findings</th>
</tr>
</thead>
</table>
| Study 1 The interaction between service providers capabilities and customers characteristics and their effects on innovation performance | Customer characteristics and organisational learning capabilities not only matter independently but the effects of customer characteristics, exploration and exploitation learning capabilities are contingent on each other in enhancing OPSs’ innovation performance.  
There is a significant positive three-way interaction between high exploration, high exploitation and high customer involvement or customer sophistication.  
OSPs that are high in all three areas tend to perform better than firms that are high in only two areas. |
| Study 2 Heterogeneity of customers through multi group analysis and the difference between subgroup of customers in enhancing the OSPs’ innovation performance | Customer characteristics and organisational learning capabilities matter independently in OPSs’ innovation performance.  
The effect of ambidexterity on innovation performance is significantly stronger for lead and active users than for average and passive users.  
Not all customers contribute to boosting OPSs’ innovation performance. The most advanced customers can contribute to improving innovation. |
| Study 3 Configuration and combination of internal capabilities and customer characteristics of highly innovative OSPs | High levels of OSP innovation performance are associated with high ambidextrous learning capabilities in OSPs and high levels of customer sophistication and involvement.  
High innovation performance in OSPs requires onshore customers and the OSPs to be relatively young and small.  
Collocating for service providers’ headquarters and customer is necessary for high innovative performance in OSPs. |
This thesis argued that working with outsourcing clients exposes OSPs to external knowledge, which can be used to improve OSPs’ service and processes; however, these benefits are contingent on OSPs having high ambidextrous learning capabilities to capture and use that knowledge.

8.3 Theoretical Implications

In conjunction with the theoretical contributions, the research findings generated in this thesis provide a number of theoretical implications about the drivers of innovation performance in outsourcing relationships and practical implications for OSPs aiming at enhancing their innovation performance.

The proposed research advances the current literature on outsourcing and makes a number of theoretical contributions.

Even though outsourcing is a significant trend in global business (Lahiri & Kedia, 2011; Manning et al., 2008), academic research on this relationship rarely involves the perspective of service providers (Almeida & Meneses, 2013; Lahiri & Kedia, 2011; Lahiri et al., 2012; Manning et al., 2008), and most studies focus on the benefits for client firms. Hence, the current research contributes to the field by showing how providing a service can also improve the innovative performance of OSPs.

There are four key contributions that this research makes to the literature in this area. The first key contribution of this research is related to the theoretical research model that incorporates OSPs’ internal learning capabilities with external knowledge sourced from their customers and assesses their relationship with OSPs’ innovation performance. This study contributes to the outsourcing literature by serving as a starting point for a discussion of how OSPs can leverage their cooperation with customers to achieve higher innovation performance.

The second contribution of this study is to show the importance of ambidextrous learning and its effect in lifting the innovation performance of OSPs, consistent with previous studies in which organisational ambidexterity appears to be positively associated with increased firm innovation.(e.g., O’Reilly & Tushman, 2013; Raisch et al., 2009; Tushman, Smith, Wood, Westerman, & O’Reilly, 2010).
The third contribution of this study lies in investigating the potential effect of incorporating knowledge from different kinds of customers and how they can affect OSPs’ innovation performance. This study showed that the level of OSPs’ innovative performance depends on the level of customer sophistication and involvement. This is in line with previous studies, which have shown that the identification of advanced users and the use of their knowledge inputs have a positive effect on firms’ innovation performance (Piller & Ihl, 2009; Piller et al., 2010; Steiner et al., 2009; von Hippel, 1990). Highly sophisticated customers with a high personal need for innovation and that are in a position ahead of an important trend are also more likely to develop innovations of high value (Franke et al., 2006).

The findings confirmed that in the context of outsourcing service provision, OSPs can benefit more from customers who are actively involved in the innovation process, which is consistent with previous studies that examined the effect of customer involvement on innovation performance (e.g., Bogers et al., 2010; Piller & Walcher, 2006) and found that not all customers are suited to contribute to the innovation process. This research shows that customers who are sophisticated, involved and located onshore have a greater effect on the innovation performance of OSPs.

Finally, and most importantly, this research showed the importance of having a combination of ambidextrous learning capability in the firm combined with sophisticated and involved customers. This supports the notion that internal capabilities of the firm and openness towards knowledge sharing are both essential for advancing innovative performance (Caloghirou et al., 2004). Although organisational learning theorists have shown the importance of ambidextrous learning on innovation and user innovation/open innovation, and scholars have separately argued the importance of users in innovation, this study is the first to show the importance of combining the two. By linking the knowledge of their advanced customers with their ambidextrous learning capabilities, OSPs can benefit more from this source of knowledge to improve their innovation performance.

8.4 Practical Implications

In this research, there are several practical implications for managers in outsourcing service provider companies and their clients. Practical implications provide a useful
contribution to the literature by offering methods that might help practitioners and managers to improve their practice (Brown & Dant, 2008; Shugan, 2003).

The findings of this thesis indicated that OSPs can incorporate outside knowledge in their in-house operations, routines and processes and develop their innovation. This research suggests that OSPs should focus on their internal capabilities as well as their customers’ knowledge because they are the key determinants of innovation.

The implications of this research have the greatest relevance for project managers and team members of outsourcing companies, who are the most likely to be involved with different customers through providing outsourcing services. Managers of outsourcing companies can also apply appropriate improvements to future procedures to enhance their innovation performance by applying some practical recommendations. These are summarised in Figure 8.1.

![Figure 8.9: Suggestions for enhancing OSPs’ innovation performance](image)

### 8.5 Research Limitations and Suggestions for Future Research

Although this study provided important insights into the role of customer characteristics of OSPs and their learning capabilities, it is not without its limitations.
First, it should be noted that this study considered only one outsourcing project in each company at the time of the survey to minimise the time required by the respondents. Consequently, considering one project at a time might not be a true representation of the whole population and other service projects in the company. Examining multiple projects within companies is suggested for future studies if this is feasible.

Second, the measurement of innovation performance in this research was subjective and for one period only. One of the main reasons for using subjective measures of innovation performance was that they are more efficient because such performance data can be collected through questionnaire survey that simultaneously elicit information on practices (Wall et al., 2004). However, reliable objective measures that measure performance over time could be used in future studies, if these are available.

Third, in this study, the effects of different types of innovation, including radical innovation, which incorporates substantially different services or processes and incremental innovations that involve minor changes in services and processes (Atuahene-Gima, 2005), were not examined.

Considering the different types of innovation in future studies could help in understanding further how service providers can fulfil both novel and relatively incremental customer needs. Some previous studies that measured exploratory and exploitative activities separately to determine the difference between the innovation outcomes found that they foster incremental innovation and radical innovation respectively (e.g., Lin & McDonough, 2014; Ribiere & Tuggle, 2010). Thus, comparing different types of innovation could be a possible avenue for future research to determine the possible different roles of exploratory and exploitative learning capabilities on different innovation outcomes.

Fourth, this study only discussed learning capabilities from the perspective of OSPs; future studies could focus on the interaction between service provider and their customers. They could take the customer perspective and examine other organisational factors that may facilitate the flow of knowledge between OSPs and customers and enhance the benefit of the partnership between these parties. Examining in more detail the process of how customers influence innovation using case studies is another possible area that can be investigated in future research. Conducting in-depth interviews can be a possible way to investigate the process of knowledge transfer from
customers to service providers. Future research could examine in more depth the possible relationship between distance or proximity of service providers and customers and its role in knowledge exchange and enhancing innovation. Finally, the framework could also be extended to examine the role of other factors, such as competitors and suppliers, as other sources of knowledge in enhancing internal innovativeness and further understanding the differences between knowledge that can be acquired from these partners.


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and horizontal knowledge inflows. *Journal of Management Studies, 44*(6), 910–931.


Appendix A: Organisational Information Statement

Professor Stephen Chen
Newcastle Business School
Faculty of Business and Law
University of Newcastle
Australia, Ph. +61 2 49216680
Email: Stephen.Chen@newcastle.edu.au

Organisational Information Statement for the Research Project

The role of outsourcing service providers’ (OSPs) learning capabilities and customer involvement on innovation performance

Since your company has been identified as a Leader in the IAOP Global Outsourcing List, your company is invited to participate in the research project identified above, which is being conducted by Ms Fatemeh Kanani under the supervision of Professor Stephen Chen, Dr Nidthida Lin from the Newcastle Business School at the University of Newcastle, Australia. The research is being carried out as a requirement of Ms Kanani’s degree in Doctor of Philosophy (Management).

Why is the research being done?

The purpose of the research is to investigate the influence of Outsourcing Service Providers’ learning capabilities and their customers’ involvement to providers’ innovation performance. It will discuss how knowledge assimilation and the potential role of different types of customers might affect OSPs’ innovation performance.
What is being asked?

We are seeking opinions from project team members who were involved in providing services with customer (preferably both onshore and offshore customers) during current three years. We request your company to forward the Participant Information Statement and the survey web link to relevant project managers or other team members to ask about their interest in taking part in this research project, on behalf of the research team.

What choice do you have?

Participation in this research is entirely voluntary.

What are the risks and benefits of participating?

There are no known risks in participating in this research, while the result of this study may benefit your company to enhance its innovation performance and also it may help to improve the services that will be offered to the customers by the company.

Also, your participation in this study will contribute to academic research on outsourcing service provider’s innovativeness by showing how their learning capabilities and customer involvement affect the innovation performance.

How will privacy be protected?

The data will be reported in aggregate and no individual respondent or company will be identified in publications. Electronic copies of the aggregated data will be stored in the Chief Investigator’s password-protected computer; hard copies will be stored in a locked cabinet in the Chief Investigator’s office at the University of Newcastle. The data will be disposed of in accordance with the University of Newcastle’s policy and procedures for the disposal of confidential material; it will be kept for a minimum of five years from the date of approval of Ms Kanani’s dissertation and then destroyed.

How will the information collected be used?

The results from this research will form part of a thesis to be submitted for Ms Kanani’s degree in Doctor of Philosophy (Management) and may be published in scholarly and
professional journals. Participants can send an email to the research team to collect a research summary after 14 October 2017.

**What do you need to do to participate?**

Once this Information Statement has been read and understood, should you wish to provide your consent to the research project as stated above, you are requested to sign the attached Organisational Consent Form and email it to c3197330@uon.edu.au or Venuskanani@gmail.com so providing informed written consent from your company.

**Further information**

If you would like further information, please contact:

**Professor Stephen Chen**  
Newcastle Business School  
Tel: +61 (0)2 4921 6680  
Stephen.Chen@newcastle.edu.au

**Fatemeh (Venus) Kanani**  
Tel: +61424890360  
C3197330@uon.edu.au

**Complaints about this research**

This project has been approved by the University’s Human Research Ethics Committee, Approval No. **H-2016-0163.** Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone +61 (02) 49216333, email Human-Ethics@newcastle.edu.au.
Appendix B: Organisation Consent Form

Organisation Consent Form for the Research Project

The role of outsourcing service providers’ (OSPs) learning capabilities and customer involvement on innovation performance

On behalf of the company, I, _________________, have read the Information Statement on the abovenamed research project to be conducted by Ms Fatemeh Kanani under the supervision of Professor Stephen Chen and Dr Nidthida Lin from the University of Newcastle, Australia. I have had the opportunity to have questions answered to my satisfaction.

As duly authorised by the company, I consent that the abovenamed researchers inviting our project managers/coordinators to participate in a survey about our innovation performance.

On behalf of the company, I give my consent freely and I understand that the project will be conducted in accordance with the Information Statement and the full approval granted to the researchers by the University of Newcastle Human Research Ethics Committee, copies of which I have retained. I understand that employees of our company will remain confidential to the researchers.
Print Name: ______________________________________________

Signature: ________________________________________________

Position Title: _____________________________________________

Company: ________________________________________________

Date: ____________________________________________________

Please email this form back to venuskanani@gmail.com or c3197330@uon.edu.au.
Appendix C: Survey Questionnaire

THE ROLE OF OUTSOURCING SERVICE PROVIDERS’ (OSPS) LEARNING CAPABILITIES AND CUSTOMER INVOLVEMENT ON INNOVATION PERFORMANCE

You are invited to participate in the research project identified above which is being conducted by Fatemeh Kanani under the supervision of Professor Stephen Chen and Dr. Nidhida Lin from the Newcastle School of Business and Law at the University of Newcastle, Australia. The research is being carried out as a requirement of Ms. Kanani’s degree in Doctor of Philosophy (Management).

Why is the research being done?

The purpose of the research is to investigate the influence of Outsourcing Service Providers’ learning capabilities and their customers’ characteristics to enhance providers’ innovation performance. It will discuss how knowledge assimilation and the potential role of different types of customers might affect OSPs’ innovation performance.

Who can participate in the research?

You are invited to participate if you are a team member of a service project that your company has provided to customers in the last 3 years. Please note that you are ineligible to participate if you were not involved with the customer during the project.

What would you be asked to do?

If you agree to participate, you will be asked to complete an online questionnaire about your company's capabilities and also your customer’s characteristics.

What choice do you have?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project at any time prior to submitting your completed survey.
Please note that due to the anonymous nature of the survey, you will not be able to withdraw your response after it has been submitted.

**How much time will it take?**

The questionnaire would take about 8 minutes of your time to complete.

**What are the risks and benefits of participating?**

There are no anticipated risks associated with participating in this research. This study may benefit your company to enhance its innovation performance and also it may help to improve the services offered by the company to the customers.

**How will your privacy be protected?**

Due to the anonymous nature of the survey/questionnaire the responses you provide will not be identifiable. Also, the collected data will be stored securely on a password protected computer / in a locked filing cabinet in the Chief Investigator’s office. Data will be retained for a minimum of 5 years as per University of Newcastle requirements.

**How will the information collected be used?**

The results from this research will form part of a thesis to be submitted for Ms Kanani degree in Doctor of Philosophy (Management) and may be published in scholarly and professional journals. Participants can send an email to the research team to obtain a research summary after 14th Oct 2017.

**What do you need to do to participate?**

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, please contact the researcher. If you would like to participate, please complete the online survey. This will be taken as your informed consent to participate.

Further information, if you would like further information, please contact with the member of the research team at the above email addresses or phone numbers. Thank you for considering this invitation.

Yours Sincerely,

Professor Stephen Chen  
Principal Supervisor

Dr. Nidthida Lin  
Co-supervisor

Ms. Fatemeh Kanani Moghadam  
Student Researcher

Complaints about this research - This project has been approved by the University's Human Research Ethics Committee, Approval No. H-2016-0163. Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the
research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.

Informed Consent

I have read and understood above Participant Information Statement and desire of my own free will to participate in this study.

☐ Yes, and start the survey

Section A: Service Providers' information

A-1 Please specify type of your company:

☐ Service provider (1)
☐ Advisor (2)
☐ Other (3) ______________

A-2 Approximately how many individuals does your organisation employ?

☐ 1-19 (1)
☐ 20-199 (2)
☐ 200 and more (3)

A-3 Please specify the year of your company establishment.

☐ 2016 (1)
☐ 2015 (2)
☐ 2014 (3)
.
.
.

A-4 Please specify types of services your company provides (please tick all that apply):
Financial Services (Banking, insurance, Markets) (1)
Manufacturing (2)
Air Transportation (3)
Retail and Consumer Goods (4)
Automotive (5)
Pharmaceutical (6)
Telecommunication (7)
Entertainment and Media (8)
Technology (Hardware, Software)
Hospitality (9)
Health Care (10)
Education (11)
Utilities (12)
Other (13) _______________

A-5 In which country is your company's headquarter located?

- Afghanistan (1)
- Albania (2)
- Algeria (3)
- Andorra (4)
- Angola (5)
- Antigua and Barbuda (6)
- Argentina (7)

A-6 Please specify in which countries is your company's subsidiaries located? (for more than one subsidiary, please hold Ctrl+ and click on country names)

Afghanistan (1)
Albania (2)
Algeria (3)
Bahrain (15)

A-7 Please specify in which countries is your company's subsidiaries located?

Albania (1)
Algeria (2)
Andorra (3)
Angola (4)
Section B: Outsourcing Service Provider/ Customer interaction

B-1 during the past three years (2013 to 2015), how many outsourcing service projects did your company provide?

- less than 5 (1)
- 6 to 10 (2)
- 11 and more (3)

B-2 during the past three years (2013 to 2015), how many new or significantly improved services did your company introduce to customers?

- Nothing (1)
- 1 to 5 (2)
- 6 and more (3)

B-3 what are the sources of knowledge and ideas your company used to improve current services or introduce the new ones?

- Internal and within our enterprise (1)
- External and from other service providers (3)
- External and from customers (4)
- other (5) __________________

B-4 to what extent does your company use ideas from customers for improving the current services or introducing new services?

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Frequently (4)
- Very frequently (5)
Section C: Outsourcing Service Providers capabilities

To answer the following questions please consider the most recent service project that you have provided to a customer.

C-1 The project name:

C-2 Your position in this project:

C-3 Exploitation Capability

Please carefully read through each question and, on a scale from (Very rarely) to (Very frequently), indicate the answer corresponding to how often the statement has happened in the recent project:

<table>
<thead>
<tr>
<th>Question</th>
<th>Very rarely (1)</th>
<th>Rarely (2)</th>
<th>Occasionally (3)</th>
<th>Frequently (4)</th>
<th>Very frequently (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Developed procedures for service provision.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>2. Improved the quality of service provision processes to its customers</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3. Improved the efficiency of the services in the project</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>4. Improved the process of services provision to your customers</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>5. Enhanced service flexibility compared with the past</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>6. Reduced service cost offered to the customers</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>7. Reduced time to respond to customer needs and improved yield in service providing</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
### C-4 Exploration Capability

Please carefully read through each question and, on a scale from (Very rarely) to (Very frequently), indicate the answer corresponding to how often the statement has happened in the recent project:

<table>
<thead>
<tr>
<th></th>
<th>Very rarely (1)</th>
<th>Rarely (2)</th>
<th>Occasionally (3)</th>
<th>Frequently (4)</th>
<th>Very frequently (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8- Introduced new generation of services to the market</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>9- Extended the range of services compared with the past</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>10- Opened up new markets compared with the past</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>11- Entered new technology fields in processes or services.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>12- Engaged in work related activities like searching for new possibilities with respect to service, processes or markets</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>13- Engaged in work related activities such as evaluating diverse options with respect to</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>14- Engaged in work related activities like focusing on strong renewal of services or processes</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>15- Opened up the new market area in the previous services</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>
Section D: Customer characteristics and innovation performance D-1

Customer characteristics

To answer the following questions, please consider the most recent service project that you have provided to a customer and indicate to what extent this customer has the following characteristics:
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Rarely (1)</th>
<th>Occasionally (3)</th>
<th>Frequently (4)</th>
<th>Very frequently (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>This customer is usually ahead of other customers in recognizing and planning new solutions to the problems they encounter.</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>17</td>
<td>They came up with some new and different solutions to meet their needs</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>18</td>
<td>They are pioneers in applying new technologies in their company</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>19</td>
<td>They recognized service benefits earlier in comparison with other customers</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>20</td>
<td>They expected high benefits from the services they receive from our company.</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>21</td>
<td>They experience new service needs earlier than most other customers</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>22</td>
<td>This customer shows high need for using outsourcing services</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>23</td>
<td>Their organisation has benefited significantly by the early adoption and use of outsourcing services.</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>24</td>
<td>We often find that they suggest new demands for the service development</td>
<td></td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
</tbody>
</table>
25. This customer cooperated with our company in developing new services.

26. They made constructive suggestions for service improvement.

27. They participated in offering the new services in different ways.

28. This customer was active in developing the new services, which our company offered.

29. This customer participated in introducing or improving the services.

**D-2** Country where this customer is based:

- Afghanistan (1)
- Albania (2)
- Algeria (3)
- Andorra (4)

**D-3** Please indicate if this customer has been involved in improving the current services or introducing the new ones with your company?

- Yes, in improving the current services (1)
- Yes, in introducing the new services (2)
- No (3)
D-4 Outsourcing service provider’s Innovation performance

Please indicate how strongly you agree or disagree with the following statements about the outcomes from this project:

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree (1)</th>
<th>Somewhat agree (2)</th>
<th>Neither agree nor disagree (3)</th>
<th>Somewhat disagree (4)</th>
<th>Strongly disagree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30- New services introduced in the project have contributed to income growth in our firm.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>31- The project has led to higher consumer satisfaction than it was before.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>32- The project has contributed to increase the firm market share.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>33- Business transaction costs in this project are lower than they were before.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>34- Customer perceived our new services, which have been provided in the project as very novel.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>35- Modifying the process of providing services has decreased the duration of the project.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>36- Improving the old services and raise quality of new ones has increased the productivity in the project.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>37- The project has accelerated the commercialization of the new services in the market.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>38- The project has developed new technology to improve service-providing process.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>39- This project has contributed to make considerable profit in our firm.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>40- The service quality has improved in the project compared to the past.</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
## Appendix D: List of Items Taken from Previous Studies for Measuring Exploration and Exploitation

<table>
<thead>
<tr>
<th>Study/author</th>
<th>Exploration</th>
<th>Exploitation</th>
</tr>
</thead>
</table>
| He and Wong (2004)    | Indicate on a 1–7 Likert scale the extent to which the statements are true regarding product development in their firm over the past three years:  
- introduction of new generations of products  
- extension of product range  
- opening up new markets  
- entering new technological fields. | Indicate on a 1–7 Likert scale the extent to which the statements are true in terms of regarding product improvement in their firm over the past three years:  
- improvement of existing products  
- improvement of product flexibility  
- reduction of production cost  
- enhancement of existing markets. |
| Atuahene-Gima (2005)  | Over the last three years, to what extent has your firm:  
- Acquired technologies and skills entirely new to the firm?  
- Learned product development skills and processes (e.g., product design, prototyping new products) entirely new to the industry?  
- Acquired entirely new managerial and organisational skills that are important for innovation (e.g., identifying emerging markets and technologies, coordinating and integrating R&D, managing the product development process)?  
- Learned new skills in areas such as funding new technology and development of R&D?  
- Strengthened innovation skills in areas where it had no prior experience? | Over the last three years, to what extent has your firm:  
- Upgraded current knowledge and skills for familiar products and technologies?  
- Invested in enhancing skills in exploiting mature technologies that improve productivity of current innovation operations?  
- Enhanced competencies in searching for solutions to customer problems that are near to existing solutions rather than completely new solutions?  
- Upgraded skills in product development processes in which the firm already possesses significant experience?  
- Strengthened our knowledge and skills for projects that improve efficiency of existing innovation activities? |
| Jansen et al. (2006)  | The extent to which units depart from existing knowledge and pursue innovations for emerging customers or financial markets:  
- Developing new products and services such as fundamentally new loan structures and contingent contracts. | The extent to which units build on existing knowledge and meet the needs of existing customers with:  
- increasing efficiency  
- aggressive lending. |
<table>
<thead>
<tr>
<th>Hernández-Espallardo et al. (2011)</th>
<th>In the past four years, your firm:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• has acquired manufacturing technologies and skills entirely new to the firm</td>
<td></td>
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<tr>
<td>• has learned product development skills and processes that are new</td>
<td></td>
</tr>
<tr>
<td>• has acquired entirely new managerial and organisational skills that are important for innovation such as identifying emerging markets and technologies or managing the product development process</td>
<td></td>
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<tr>
<td>• has learned new skills in areas such as staffing R&amp;D, training and development of R&amp;D and engineering personnel for the first time</td>
<td></td>
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<tr>
<td>• has strengthened innovation skills in areas where it had no prior experience.</td>
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<tr>
<td>In the past four years, your firm:</td>
<td></td>
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<tr>
<td>• has based its strategy on knowledge and abilities your firm was already familiar with</td>
<td></td>
</tr>
<tr>
<td>• has invested mainly in enhancing skills in exploiting mature technologies</td>
<td></td>
</tr>
<tr>
<td>• has searched for solutions to customer problems that were near to existing solutions rather than completely new solutions</td>
<td></td>
</tr>
<tr>
<td>• has upgraded skills in product development processes in which the firm already possesses significant experience</td>
<td></td>
</tr>
<tr>
<td>• has targeted the effort to improve the efficiency of the innovation processes rather than initiate new adventures radically different from what the firm was familiar with.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix E: Robustness Check for Ordinary Least Squares Model

* rcheck innova CompanySize CompanyAge ExploitationCap ExplorationCap
  CusType CustSophistication Cus Involvement

Huber iteration 1: maximum difference in weights = .36177996
Huber iteration 2: maximum difference in weights = .05036973
Huber iteration 3: maximum difference in weights = .02600258
Biweight iteration 4: maximum difference in weights = .15618365
Biweight iteration 5: maximum difference in weights = .0215907
Biweight iteration 6: maximum difference in weights = .00805715

Robust regression          Number of obs  =  81
                           F(7, 73)  =  4.67
                           Prob > F    =  0.0002

| innova Perf | Coef.   | Std. Err. | t     | P>|t|  | [95% Conf. Interval] |
|-------------|---------|-----------|-------|------|----------------------|
| Company Size| -.374   | .1561     | -2.75 | 0.008 | -.6453068            | -.1027617 |
| Company Age | .0144   | .007      | 2.00  | 0.049 | .0000445             | .0287581  |
| Exploitation Cap | -.162 | .135      | -1.20 | 0.234 | -.4337712            | .1077992  |
| Exploration Cap | .519  | .133      | 3.89  | 0.000 | .2528813             | .785237   |
| Cus Type     | -.180   | .150      | -1.20 | 0.233 | -.4795589            | .1185015  |
| Cus Sophistication | -.174 | .131      | -1.32 | 0.190 | -.4369895            | .0880825  |
| Cus Involvement | .223  | .1244     | 1.79  | 0.077 | -.0248843            | .4713021  |
| _cons        | 2.834   | .538      | 5.31  | 0.000 | 1.770486            | 3.897578  |