Capability Development in an Offshoring Context
How, Why and by Whom

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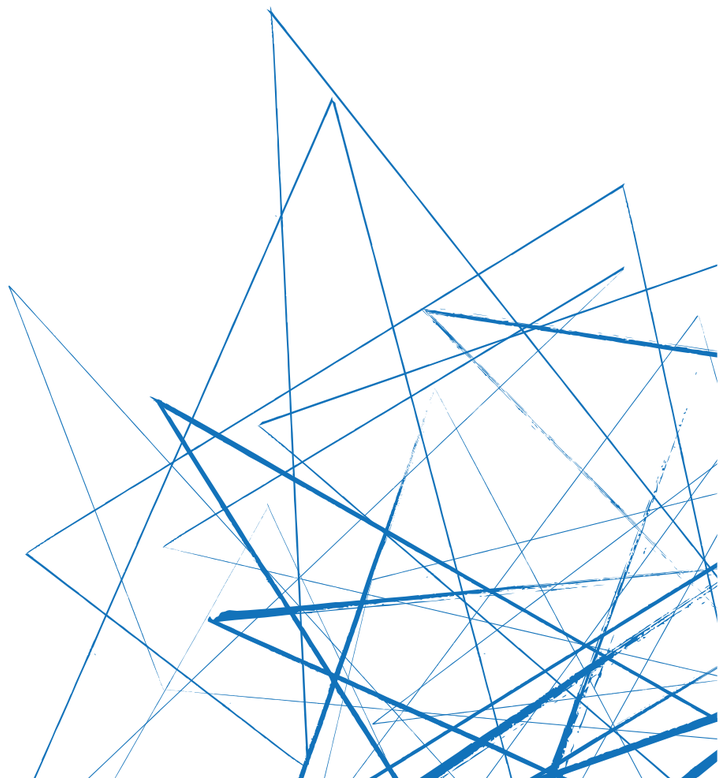

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Preface

Abstract

Capability development can be defined as deliberate firm-level investment involving a search and learning process aimed at modifying or enhancing existing capabilities. Increasingly, firms are relocating advanced services to offshore locations resulting in the challenge of capability development in the offshore unit. Guided by the research question – *what drives or impedes capability development in an offshoring context* – the purpose of this thesis is to investigate how an idiosyncratic offshoring context affects capability development.

The thesis consists of three papers using various datasets and qualitative methods that investigate capability development in an offshoring context. The first paper investigates how capability development takes place for a service-provider firm at the activity level. The second paper examines the transition made by a captive offshore unit, from performing standardized activities to R&D activities. The third paper examines capability development at the cluster level, and examines how spillovers from firms contribute to the emergence and evolution of clusters.

Overall, this thesis argues that capability development is a path dependent process, and the offshoring context complicates the identification of capabilities lacking, the resources required to develop these capabilities and the alignment of supporting organizational processes. Captive offshore units and local service providers often perform back-office or standardized tasks that have been disaggregated from the value chain. In these cases, capability development presents a challenge, as firms need to take deliberate actions in order to develop capabilities, and identify the external linkages they must form to aid the capability development process.

Resumé

Kapacitetsudvikling kan defineres som den bevidste investering på virksomhedsniveau, der involverer en udforsknings- og læringsproces, der har til formål at ændre eller forbedre eksisterende kapaciteter.

Virksomheder anvender i stigende grad offshoring af avancerede services, hvilket resulterer i udfordringer med kapacitetsudvikling i offshoreenheden. Med udgangspunkt i forskningsspørgsmålet – *hvad driver eller hæmmer kapacitetsudvikling i en offshoringkontekst* – er formålet med denne afhandling at undersøge hvordan en særegen offshoringkontekst påvirker kapacitetsudvikling.

Denne afhandling består af tre artikler, der anvender forskellige datasæt og kvalitative metodologier til at undersøge kapacitetsudvikling i en offshoringkontekst. Den første artikel undersøger hvordan kapacitetsudvikling finder sted for en serviceudbyder på aktivitetsniveauet. Den anden artikel undersøger transitionen foretaget af en offshoreenhed, fra udførsel af standardiserede aktiviteter til R&D aktiviteter. Den tredje artikel undersøger kapacitetsudvikling på klyngeniveau og undersøger hvordan spillover-effekter fra virksomheder bidrager til dannelsen af klynger og hvordan disse påvirker evolutionen i klynger.

Denne afhandling argumenterer for, at kapacitetsudvikling er en stiafhængig proces og at offshoringkonteksten besværliggør identifikation af de manglende kapaciteter, de resurser der kræves for at udvikle disse kapaciteter samt tilpasningen af understøttende organisatoriske processer. Offshoreenheder og lokale serviceudbydere udfører ofte back-office aktiviteter eller standardiserede aktiviteter, der er blevet separeret fra værdikæden. I disse tilfælde udgør kapacitetsudvikling en udfordring, da virksomheder skal foretage bevidste handlinger for at udvikle kapaciteter og identificere de eksterne forbindelser de må danne for at understøtte kapacitetsudviklingsprocessen.

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Chapter 1: Capability Development in an offshoring context: An introduction

1.1 PURPOSE OF THIS THESIS

This thesis investigates capability development in an offshoring context. The search for a definition of capability development is akin to asking the question of the origin of capabilities. Based on the understanding that firms "possess heterogeneous capabilities as a function of their routines and search processes" (Ethiraj, Kale, Krishnan, & Singh, 2005: 28), I define capability development as a *deliberate firm-level investment involving a search and learning process aimed at modifying or enhancing existing capabilities.* These improvements are in response to an internal or external change agent and allow the firm to satisfactorily meet the demands placed on it by the internal or external change agent. Capability development can for example, require the modification of internal routines, knowledge restructuring, development of new knowledge (Parida, Wincent, & Kohtamäki, 2013), trial and error experimentation, integrating resources among activities (Amit and Schoemaker, 1993; Montealegre, 2002), among others. Capability development incorporates recognized processes such as learning and transferring knowledge but extends beyond them. The ambition of this thesis is to address the call for understanding how capabilities are developed (Eisenhardt and Martin, 2000; Winter, 2003; Zollo and Winter, 2002) and shed light on the processes and sub-processes of capability development.

Capabilities refer to a firm's ability to deploy resources (Amit and Schoemaker, 1993). Inspired by Nelson and Winter's (1982) early work and subsequent works in a similar vein (e.g., Winter, 2000; 2003), I adopt Winter's definition of a capability as "a high level routine (or collection of routines) that, together with its implementing input flows, confers upon

an organization's management a set of decision options for producing significant outputs of a particular type" (2003, p. 991).

Capability development in the offshoring context presents an interesting phenomenon as it is often challenging in the multinational organization. Offshoring is defined as "the relocation of organizational tasks and services to foreign locations" (Jensen, Larsen and Pedersen, 2013: 315). Firms relocate activities to support domestic and global operations (Contractor, Kumar, Kundu and Pedersen, 2010; Lewin & Peeters, 2006), and they do so either internally (captive offshoring) or externally with an outsourcing partner (offshore outsourcing). From an evolutionary point of view, offshoring practices have progressed from the relocation of manufacturing and standardized activities to include more knowledge-intensive, complex, innovation-based activities (Doh, Bunyaratavej and Hahn, 2009; Jensen et al., 2013; Lewin, Massini and Peeters, 2009). The combination of increasingly global competition, the liberalization of trade, advances in technology that allow for increased modularity and the decline in transmission costs (Contractor et al., 2010) has shifted the motivation for offshoring from wage arbitrage to access to talent, access to strategic resources and increased opportunities in foreign locations.

Capability development in an offshoring context can seem comparable to the subsidiary mandate literature. Subsidiary capability development can takes place through three key mechanisms: head office assignment, subsidiary choice or local environment determinism (Birkinshaw and Hood, 1998). In order for the evolution to take place their needs to be capability development within the subsidiary (Egelhoff, Gorman and McCormick, 1998). However, in the context of a captive offshore unit, the capability development is most likely a "top-down" phenomenon, as compared to a subsidiary where it could either be "top-down" or "bottom-up".

Captive offshore units and local service providers often perform back-office or standardized tasks that have been disaggregated from the value chain. In these cases, capability development presents a challenge. These units have limited access to knowledge and often perform disaggregated activities that form a small part of the value chain. Consequently, they receive piecemeal knowledge and the parent or client firm makes limited investments in their capabilities. In this context, the capabilities essential for performing complex tasks and, thereby, moving up the value chain can be difficult to develop. Therefore, offshore units performing standardized tasks and local service providers need to take concrete steps to identify the capabilities they lack and the actions required to develop them. This leads to the question of why offshore units need to develop capabilities. Capability development can be relevant in several scenarios: First, offshore locations are no longer necessarily viewed as simply responsible for support tasks. They are increasingly being recognized for the talent they house and can be leveraged to strengthen the presence in the offshore location. Second, offshore locations continue to offer low-cost advantages. Therefore, the firm has an opportunity to take advantage of their cost benefits and talent. Third, as firm behaviours are path dependent, it is logical to invest in the development of existing units or relationships with service providers rather than establish new units. Finally, capability development can create new challenges and possibilities within the offshore unit, which might help address issues related to the high attrition rates commonly found in the organizations performing highly standardized activities.

The purpose of this thesis is to examine how an idiosyncratic offshoring context affects capability development. As capabilities and their development are path dependent (Helfat and Peteraf, 2009), a firm's past experience and knowledge play an important role. This raises a number of questions: How does a firm with limited experience in complex activities

identify the lacking capabilities and develop them? What challenges does the piecemeal relocation of knowledge create in the process of capability development? What motivates offshore units to begin the process of capability development? To answer these questions, this thesis offers three distinct research papers that rely on various datasets and qualitative methods. Each paper investigates different aspects of capability development, such as the underlying motivations and mechanisms shaping this process, impediments to the process, and the role of managers in onsite and offshore units. The overall research question this thesis aims to answer is: *What drives or impedes capability development in an offshoring context?*

The remainder of this introductory chapter is organized in three parts. In the first part, I place the thesis within the broader context. In this regard, I discuss the evolution of offshoring and the relevance of examining capabilities in this context. Second, I examine the extant literature on capabilities in relation to offshoring. Finally, I outline the research design and the structure of this thesis, including the research methods. I also discuss the content and contributions of the three research papers.

1.2 THE CONTEXT OF THIS THESIS

Defining Capability Development

As capability development is a relatively ubiquitous concept, it is important to delineate what is meant by "capabilities" and "capability development" throughout this thesis. In order to answer the main research question, I apply the theoretical perspective of capabilities that is founded in the resource-based view pioneered by Penrose (1959). The central argument is that the learning required to effectively develop a capability to engage in a certain activity may be difficult or time consuming. In fact, it may be impossible for some firms (Penrose, 1959). Therefore, firms

need to take certain steps to ensure the development of capabilities (Amit & Schoemaker, 1993). In a similar vein, Nelson and Winter (1982) discuss the roles of routines and capabilities. They suggest that routines are repetitive, recognizable patterns of interdependent actions, while capabilities are high-level routine or collections of routines (Feldman and Pentland, 2003: 95; Nelson and Winter, 1982). Therefore, learning, experiences, resources and routines serve as inputs for capabilities (Zollo and Winter, 2002).

Capabilities have been widely discussed in the resource-based and competence-based theories of the firm (Baden-Fuller and Volberda, 1997; Sanchez, Heene and Thomas, 1996). Terms such as competences (McKelvey, 1982), core competences (Hamel and Prahalad, 1993; Henderson and Cockburn, 1994; Prahalad and Hamel, 1990), firm-specific competences (Pavitt, 1991), resource deployments (Hofer and Schendel, 1978), strategic assets, (Amit & Schoemaker, 1993; Winter, 1987), dynamic capabilities (Teece, Pisano, and Schuen, 1997), core capabilities (Leonard-Barton, 1992) and capabilities (Stalk, Evans and Schulman, 1992; Ulrich and Lake, 1990) have been used in efforts to describe how resource deployment or organizational skills lead to competitive advantage (Hoopes and Madsen, 2008). In Table 1-1, I offer a summary of the different research streams and their varying definition of capabilities.

In this thesis, I focus on ordinary operational capabilities, which are defined as "repeatable patterns of action in the use of assets to create, produce, and/or offer products to a market" (Sanchez 2004: 519). Furthermore, I refer to capabilities as "a firm's capacity to deploy resources, usually in combination, using organizational processes, to achieve a desired end" (Amit and Schoemaker, 1993: 35). Operational capabilities are comprised of a number of sub-capabilities, which enable the organisation to take advantage of commercial opportunities (Parida et al., 2013), are context-dependent, and are influenced by the context in which they

develop and evolve (Laamanen & Wallin, 2009). They emerge through path-dependent learning experiences (Helfat and Peteraf, 2009; Parida, et al., 2013). Operational capabilities are embedded in the organization and its processes, and they enhance the productivity of the other resources possessed by the firm (Makadok, 2001). As such, this thesis focuses on the *patterns of action and the combination of assets with routines and organizational processes (i.e., operational capabilities), and the evolution or development of these capabilities*.

Capability development is needed for an organization to react to or cause change, and for meeting commercial expectations (Barr, Stimpert, Lawrence and Huff, 1992; Cyert and March, 1963; Normann, 1977; Ocasio, 1997; Walsh, 1995, Weick, 1995). Capability development is limited by the firm's existing base of capabilities, and it is influenced by the firm's resources and its past experiences in developing capabilities (Grant, 1996). Therefore, the recognition and identification of the steps necessary to develop capabilities are crucial (Laamanen and Wallin, 2009). The evolution of capabilities – or capability development – often follows an incremental path, as capabilities "involve patterned activities oriented to relatively specific objectives" (Hoopes and Madsen, 2008: 411) and, therefore, do not radically change in short periods of time (Dosi, Nelson and Winter, 2000: 12; Henderson and Cockburn, 1994; Milgrom and Roberts, 1990; Patel and Pavitt, 2000). Consequently, capability development is a lengthy, complex process that is path dependent (Montealegre, 2002).

Table 1-1 Classifications and Definitions of Capabilities

Research Stream	Type of Capability	Definition
Evolutionary perspective	Routines, *Nelson & Winter, 1982*	Collective pattern of behaviour that is followed repeatedly and is the basis of behavioural continuity
	Capabilities, *Winter, 2000, 2003*	A high-level routine (or collection of routines) that presents management with a set of decision options
Competence-based view	Functional capabilities, *Prahalad & Hamel, 1990; Amit & Schoemaker, 1993; Pisano, 1997*	Allow firms to mobilize and combine individual knowledge and skills across boundaries to create new resources
	Competences, *Baden-Fuller & Volbera, 1997*	Knowledge among a large group of units within a complex firm
	Innovation/integration capabilities, *Fuchs, Mifflin, Miller & Whitney, 2000*	Higher-order integration capability: the ability to mould integrate key capabilities and resources of the firm to successfully stimulate innovation
Absorptive Capacity	Problem-solving capabilities, *Cohen & Levinthal, 1990*	A capacity to create new knowledge
	Learning capabilities, *Cohen & Levinthal, 1990*	Development of the capacity to assimilate existing knowledge
Knowledge-based view	Recombinative/integrative capabilities,[1] *Grant, 1996; Henderson & Clark, 1990; Kogut & Zander, 1992; Pisano, 1997*	Allow firms to absorb knowledge from external sources and blend the different technical competencies developed in various departments
	Local capabilities, *Kusunoki, Nonaka & Nagata, 1998*	Functional knowledge embodied in a specific group of engineers, technologies, databases and patents
	Architectural capabilities, *Kusunoki, Nonaka & Nagata, 1998*	Task partitioning and linkages among functional groups, configuration of authority, and the distribution of resources
	Process capabilities, *Kusunoki, Nonaka & Nagata, 1998; Gold Malhotra & Segars, 2001*	Communication and coordination across different functional groups; individual units of knowledge are combined and transformed
	Systems capabilities, *Gold, Malhotra & Segars, 2001*	Technology-oriented facets of knowledge transfer, including technical infrastructure and IT systems
Resource-based view	Resources/capabilities (often used interchangeably), *Barney, 2001; Ray, Barney & Muhanna, 2004*	Ability of firms to use their resources to generate competitive advantages
Dynamic capabilities	Dynamic capabilities, *Teece, Pisano & Shuen, 1997; Winter, 2003*	Enable a firm to alter how it makes its living and result in competitive advantages
	Absorptive capacity capability, *Zahra & George, 2002*	Pertains to knowledge creation and utilization that enhances a firm's ability to gain and sustain a competitive advantage
	Ordinary/operational/zero-level capabilities, *Rahmandad, 2012; Winter, 2003; Collis, 1994*	Permit a firm to make a living in the short term and perform an activity on an on-going basis using the same techniques

[1] The dynamic-capabilities literature also discusses integrative capabilities and interprets them as a firm's ability to tailor technology to meet firm-specific needs (Helfat and Raubitschek, 2000; Iansiti and Clark, 1994).

Despite the relevance of capability development for organizations and the widespread academic interest in how capabilities (and related elements, such as competence) yield competitive advantage, there is no overall model of how capabilities are developed or managed. Moreover, we lack an understanding of the salient organizing principles (Montealegre, 2002; Parida et al., 2013; Un & Montoro-Sanchez, 2010). This might be explained by the fact that numerous definitions of capabilities exist and that they pertain to specific aspects of organizations. In this thesis, I offer a simplified approach to understanding capabilities. I focus on operational or ordinary capabilities in order to identify the roles played by strategic actions and individual effort in the identification of the capabilities that need to be developed, the development process itself and the types of capabilities that are developed.

Recent critiques in the capability literature argue that one weakness in this field is that most attention is on the collective level (Un and Montoro-Sanchez, 2010). Felin and Foss (2005) claim that this focus is at the expense of the individual level, and view organizations as an aggregation of individuals (Felin, Foss, Heimeriks and Madsen, 2012). Moreover, they claim that as enacting processes within organizations requires individuals and individual action, more attention should be paid to this level of the organization. Notably, however, organizational capabilities reside in individuals, within organizations and across regions. Along these lines, Teece (1982) argues that capabilities are supraindividual and not "reducible to individual memory" (Teece 1982: 44). Furthermore, capabilities and organizational processes are closely related, making it difficult to identify and study them in isolation. By focusing on the processes in which capabilities are employed, we can better understand their deployment and related processes (Hammer and Champy, 1993). A focus on capability development at the project or team level allows for closer examination of the processes facilitating capability development.

Projects or teams are mechanisms for knowledge transfer, and they convert individual capabilities into organizational capabilities (Prahalad and Hamel, 1990). Therefore, studies of smaller group or teams can provide a closer look at the processes through which capabilities are developed. In addition to the individual, project, team and organizational levels, capabilities can emerge and develop at the regional or cluster level (Marshall, 1920; Zaheer, Lamin and Subramani, 2009). Marshall (1920) refers to these capabilities as external economies available in industrial districts. Cluster or regional capabilities affect interactions among firms as well as the competitiveness of firms. Examples of such capabilities are knowledge sharing in R&D networks, collective innovation and shared norms (Foss, 1996).

The above discussion highlights the finding that capabilities are collective phenomena that can exist at various levels of analysis (Teece et al., 1997). Arguably, the capabilities found at the individual or team level (e.g., problem-solving capabilities) differ from organizational capabilities (e.g., functional capabilities) and cluster capabilities (e.g., collective innovation capabilities). Therefore, studies of capabilities and the underlying processes facilitating their development at various analytical levels can be fruitful.

Evolution of Offshoring in a Capability Development Context

An increasingly popular trend in offshoring is the relocation of product-development functions, such as engineering, research and development (R&D), and product design (Lewin et al., 2009; Manning, Massini and Lewin, 2008; Maskell, Pedersen, Petersen and Dick-Nielsen, 2007; Subramaniam and Venkatraman, 2001) to emerging markets, such as India. This trend represents a deviation from the traditional understanding of offshoring in which firms relocate support activities and business processes, or standard, highly modularized activities (Lewin and Couto, 2007; Manning et al., 2008). This recent phenomenon has led to a corresponding

research interest in how and why the relocation of R&D and innovation activities is feasible, as these activities have traditionally been viewed as highly complex, difficult to partition and tacit, making them difficult to disintegrate and relocate. Furthermore, such activities are at the core of competitive advantage and should, according to extant theory, be kept under tight control (Mudambi and Tallman, 2010; Grimpe and Kaiser, 2010).

However, reducing labour costs and gaining access to new markets are no longer the strategic drivers of offshoring decisions (Manning et al., 2008). The trend in which companies offshore complex, higher value-adding activities is influenced by a number of factors, such as trade-liberalization policies; advances in information technologies (Doh, 2005; Dossani and Kenney, 2006; Levy, 2005); and the ability to disintermediate and modularize almost any process, including knowledge-creating processes (Lewin et al., 2009; Sako, 2002; Takeishi, 2002). In addition to these factors, the abundance of talent in emerging economics (Bunyaratavej et al., 2007; Lewin and Couto, 2007; Lewin and Peeters, 2006), combined with the increasing scarcity of engineers in the western world, is leading to the 'global sourcing of talent', which Manning et al. (2008) identify as a new strategic driver in the relocation of complex activities.

While the relocation of complex activities represents a significant departure from the standardized activities that have traditionally been offshored, the move from standardized to complex is consistent with trends of emerging economy firms attempting to move up the value chain. Altenburg et al. (2008) argue that as innovation capabilities have remained concentrated in the EU, the US and Japan, firms from emerging economies need to start the slow process of improving their innovative capabilities. Product life cycle theory states that production is relocated from developed nations to developing nations as products enter the mature stage

(Vernon, 1966). Similarly, the global value-chain literature claims that local producers learn about improving their production processes, attaining higher quality and increasing the speed of response from global buyers. Through process, product or functional upgrades, local buyers are able to improve their facilities and meet the demands for more sophisticated products (Gereffi, 1999; Humphrey and Schmitz, 2002). In a similar vein, scholars have examined the accelerated internationalization of emerging-economy firms and termed their behaviour as 'catching-up' or 'leap-frogging' in which they need to compensate for their 'late-comer disadvantage'. They do so by learning from developed-nation firms and leveraging on their experiences (Matthews, 2002; 2006), and through joint ventures, alliances and OEM agreements (Ge and Ding, 2008). Hobday (1995) claims that the two key disadvantages latecomer firms need to overcome are distance from the main technological sources, which gives rise to a lag in terms of science and innovation, and distance from leading-edge markets and demanding users. In order to overcome these significant disadvantages, firms from developing nations or latecomer firms must overcome barriers to entry and then form linkages to users or sources of innovation.

Therefore, the shift from the relocation of standardized activities toward the relocation of complex activities follows historical trends and is consistent with earlier theories of firm evolution. However, those theories focus on the learning or leveraging mechanisms through which firms overcome their disadvantages. Consistent with our understanding of path dependence, "what has happened at an earlier point in time will affect the possible outcomes of a sequence of events occurring at a later point in time" (Sewell, 1996: 262). Therefore, it is important to *examine how firms or units performing standardized activities can take on complex activities without prior experience in performing such activities.* The undertaking of complex services gains even more salience when we consider that offshoring services are often provided

by external firms, which receive piecemeal information about how to complete a specific task and do not have a comprehensive understanding of their clients' value propositions. Therefore, in addition to highly skilled and qualified workers, local firms need access to subject-matter expertise (Lewin & Peeters, 2006) and architectural knowledge in order to enhance their capabilities and deliver value-added services (Awate, Larsen and Mudambi, 2012).

Lewin and Volberda claim that "no single IB theory explains how and why firms offshore and develop over time as they do" (2011: 244). Researchers explain offshoring in terms of the objectives firms seek to achieve: wage arbitration, cost advantages (Dossani and Kenney, 2003), access to talent (Lewin et al., 2008), strategic advantages (Martinez-Noya and Garcia-Canal, 2011), efficiency, and access to resources or markets (Nachum and Zaheer, 2005; see Schmeiser, 2013, for an overview). While the offshoring phenomenon has been the subject of an increasing amount of attention, a significant proportion of this research has focused on the 'what', 'why' and 'where' aspects of offshoring. Another emerging stream of research has examined the performance implications of offshoring in terms of, for example, cost savings (Lewin & Peeters, 2006), innovation (Grimpe and Kaiser, 2010; Nieto and Rodriguez, 2011), learning (Jensen, 2009), firm coordination (Kumar, van Fenema and Glinow, 2009; Srikanth and Puranam, 2011) and hidden costs (Larsen, Manning and Pedersen, 2013; Stringfellow, Teagarden and Nie, 2008). One prominent focus in this stream of research is how organizational learning and capabilities are developed during and throughout the offshoring process (e.g., Jensen 2009; 2012; Ethiraj et al., 2005). This stream of research identifies how these processes unfold and how they are related to the relocation process. In the following paragraphs, I review the offshoring literature utilizing the capability-based view for analyses of both captive offshoring and offshore outsourcing (see Table 1-2 for a summary).

Table 1-2 shows that the process of capability development and the changing nature of capabilities have received limited attention in the offshoring literature. The research can broadly be divided in terms of its focus on either the home unit (i.e., onsite unit, client or focal firm) or the offshore unit (i.e., service provider or subsidiary). Manning, Hutzschenreuter and Strathmann (2012) examine offshored R&D, as well as organisations' responses to task and interface ambiguity. They find that interface-management capabilities, which are the capabilities related to relocating particular tasks and then integrating the outcomes into larger workflows, can assist in the relocation of R&D processes. Interface-management capabilities can address the tension between the need to define and specify processes and interfaces prior to relocation (e.g., Blinder, 2006; Mani, Barua and Whinston, 2010), and the often-limited ability to fully specify processes and interfaces due to the tacitness of knowledge (Brusoni, 2005; Gertler, 2003; Leonardi and Bailey, 2008). Interface-management capabilities are particularly salient in the context of offshoring. However, they can also be applied in the context of distributed R&D or to understand the distribution of advanced tasks that involve tacit knowledge. Manning et al.'s (2012) study is also relevant, as it identifies particular capabilities that deal with the coordination challenges implicit in the relocation process (Kumar et al., 2009; Srikanth and Puranam, 2011).

Firms begin by engaging in offshore outsourcing of low-risk, standardized activities. However, as they gain experience and enhance their decision-making abilities, they are driven not only by wage and cost considerations, but also by the strategic and knowledge benefits they can derive from offshore outsourcing (Maskell et al., 2007). Capability development relates to the learning process that takes place during the offshoring process, which in turn enhances the firm's decision-making capabilities, its ability to manage the offshore

outsourcing process, and the inherent risk and coordination that the process entails. Jensen (2012) focuses on how offshore outsourcing contributes to the client's resource stock. He finds that the client firm can create value through offshore outsourcing. Through such mechanisms as engagement in the partnership and learning, client firms are able to build knowledge resources related to technologies, processes, and the management and organization of offshore outsourcing work across national and firm borders. This is similar to Maskell et al.'s (2007) finding that the process of offshore outsourcing enhances the organization's ability to manage the relocation process. Furthermore, firms are not only able to manage the uncertainty associated with relocation and meet additional demands for coordination, but they can also enhance their own organizational capabilities beyond the initial scope.

Table 1-2 Capability-development Studies in offshoring

Study	Research Context	Data/Methods	Capabilities
Ethiraj, Kale, Krishnan & Singh (2005)	The origin of capabilities	A panel of 57 clients for which the firm executed two or more projects during the study period. Focus on the service provider.	Examines client-specific capabilities (a function of repeated interactions with clients over time) and project-management capabilities (acquired through deliberate and persistent investments in infrastructure).
Maskell, Pedersen, Petersen & Dick-Nielsen (2007)	Offshoring as a learning-by-doing process in which the firm goes through a sequence of stages, progressively moving towards sourcing for innovation	Survey of Danish firms. Asked if they had outsourced activities that had previously been conducted in house to independent firms in low-cost countries.	Initial offshoring is driven by cost-minimization benefits. However, over time, experience in offshoring lessens the cognitive limitations of decision makers, who recognize the quality improvement and innovation advantages that can be gained.
Jensen (2009)	Applies a learning perspective to the offshoring of advanced services	Three longitudinal case studies of Danish-Indian offshoring partnerships.	When offshoring partnerships mature and firms gain experience, learning evolves in both the home and host firms over time, and it differs from the initial objectives and expectations.
Jensen (2012)	How offshore outsourcing processes contribute to the resource stock of client firms	Two case studies, each of which involves one Danish firm and an Indian offshoring business partner (a total of four firms).	Client firms used their experiences to upgrade their organizational and business processes. Through strategic and systemic learning, they incorporated more transparent workflows, better documentation and improved technical capabilities.
Manning, Hutzschenreuter & Strathmann (2012)	How firms develop interface-management capabilities in the context of globally distributed knowledge work	In-depth, single case study of several R&D locations.	The interface-management capability (organizational capability) assists in the disintegration and reintegration of relocated tasks into larger workflows.

Jensen (2009) examines the learning that takes place both for the client and the service provider. His study stands in contrast to the many studies in this stream that focus on the loss of competitiveness and capabilities firms experience as a consequence of offshore outsourcing. Similar to Maskell et al. (2007), Jensen (2009) finds that evolution in the type of activity that is offshored comes about through experience in offshoring. The home site benefits from strategic learning in terms of such aspects as improved competitiveness and flexibility, and it can use offshoring as a means to rapidly internationalize. These units also make changes in more functional aspects (i.e., systemic learning), such as project implementation, recruitment systems, and internal procedures and documents. In contrast, the service provider in this study uses the connections with the client as a bridge into the European market. Ethiraj et al. (2005) analyse the service provider's capability development. They focus on two types of capabilities. The first – client-specific capabilities – are a function of repeated interactions with a given client across multiple projects over time. They are accumulated through repeat interactions with the client, and they reflect tacit knowledge of the client's business domain and operating routines. The second – project-management capabilities – are acquired through deliberate and persistent investments in infrastructure and training. The development of these capabilities relies not only on implicit learning through repeat interactions, but also on deliberate investments in software design, development and execution.

These studies represent a departure from the common understanding and portrayal of offshoring as leading to a hollowing out (Kotabe, 1989; Kotabe, Mol and Ketkar, 2008) or depletion of integrative capabilities (Weigelt, 2009), and as having a negative impact on overall performance. The offshoring process is an exercise in organizational design (Larsen et al., 2013), and firms may benefit from developing certain capabilities. From the above, we know

that: (1) both the onsite and offshore units can benefit from capability development through repeated interaction and learning processes; (2) capability development can take place through both offshore outsourcing and captive offshoring; and (3) research focused on the capability development that can take place through offshoring is limited.

In addition to the offshoring literature, capability development has been examined in studies of subsidiary evolution. Capabilities are defined as a subsidiary's capacity to deploy resources, in combination with organizational processes to achieve a desired end (Birkinshaw and Hood, 1998) and they are the main mechanism through which subsidiary evolution takes place. Birkinshaw (1996) claims that the subsidiary's role is assigned by the parent company based on the capabilities of the subsidiary and the strategic importance of the local market (Birkinshaw and Hood, 1998; Bartlett & Ghoshal, 1986). Capability development at the subsidiary level occurs when the subsidiary interacts with its external network, interacts with customers or suppliers, identifies a niche in the local market, or identifies problems requiring modifications or improvements (Birkinshaw and Hood, 1998; Andersson, 2003; Andersson, Forsgren and Holm, 2007). Therefore, in order for subsidiary evolution to take place, there must be a development in subsidiary capabilities. Specialized technologies (Egelhoff et al., 1998), product portfolios (Hood, Young and Lal, 1994), managerial expertise (Rugman and Douglas, 1986), entrepreneurial efforts (Birkinshaw and Hood, 1997) and internal R&D processes have all been found to be central in upgrading processes (Florida, 1997; Pearce, 1999; Taggart, 1998).

In summary, capability-development research in offshoring and other related research streams is sparse. This can be explained by the idiosyncrasies of the capability concept, which can be difficult to measure and observe (Foss, 1997; Un & Montoro-Sanchez, 2010). However, some researchers have recently attempted to examine the capability development that

takes place during the process of relocation and at the offshore unit. By focusing on the learning and capability development that takes place in both units, it is possible to provide a more nuanced view of the relationship between the home and offshore units, and between the client and the service provider. Rather than relegating the offshore unit to a back-office role, it is important to consider the contributions this unit can make to overall capabilities within a larger context.

1.3 RESEARCH DESIGN

This thesis consists of three distinct research papers that investigate individual research questions related to capability development and its outcomes in an offshoring context. While each paper is self-contained, the intention of the thesis is that the individual contributions from each paper provide an in-depth look into the processes of capability development and provide a coherent answer to the main research question asked in this thesis.

All three research papers utilise qualitative methods in order to develop a multidimensional understanding of the research topic (Eisenhardt, 1989; Meredith, 1998). This thesis focuses on the dynamic process of capability development, its antecedents and the underlying mechanisms, which are not yet thoroughly understood. As such, a case study was the logical method (Yin, 2009).

Each paper seeks to explain the process of capability development from a different level of analysis using detailed case studies. Moreover, the three papers use different datasets to examine capability development. One commonality among the case studies is that all of the companies are active in India, where they engage in either captive or outsourcing offshoring. This commonality allows a more holistic picture of the focal phenomenon to emerge. The case-

selection strategy was a crucial part of the research strategy (Flyvbjerg, 2007), as the use of cases that were based in the Indian context and that involve the offshoring of advanced services allows for generalization of the findings and for theory building (Eisenhardt, 1989; Flyvbjerg, 2007; Yin, 2003). On the basis of Flyvbjerg's (2007) model for case-selection strategies, I utilized the maximum variation strategy. The study is not confined to one industry sector but covers the offshoring of advanced services[2] in different industries.

Why India?

India is a relevant context for studies of capability development. The Indian software industry is no longer just a global player in standardized services. It is becoming a global player in more complex services. In this regard, it is rapidly climbing the value chain and engaging in more innovative activities.

India was ranked first out of the 55 countries included in the Global Service Location Index (GSLI) (ATKearney, 2016). Offshoring to India began with the establishment call centres. The country has gradually climbed the value chain, so that it now handles most functions in BPO and IT. The rise of India as the premiere offshoring destination mirrors the product life cycle, and other countries have begun replicating the Indian model (Nasscom, 2011). Consequently, India is shifting its focus toward more complex services, such as R&D, while other countries, such as the Philippines, Malaysia and China, are working to catch up in the IT and BPO sectors. Currently, India holds more than 70% of the knowledge-services outsourcing market, which focuses on the core activities of the firm (Nasscom, 2011).

The Indian IT industry has been particularly skilled in identifying and creating value propositions for global clients, and it has successfully built technical and supporting

[2] UNCTAD (2004) defines advanced services as high-skill, creative and skill-intensive.

capabilities. Indian firms needed to develop scale capabilities to meet the growing demand, organizational capabilities to deal with attrition, human resource management capabilities, technical abilities, and capabilities useful for managing relationships with clients. Through slow and incremental learning, the IT firms created a new business model and established a successful BPO industry (Athreye, 2005). Arguably, by examining the relocation of R&D and innovation-related services, we can identify how firms evolve and develop capabilities to meet these needs.

As the Indian offshoring industry moves into more complex value propositions, it is increasingly viewed as a leader by other locations wishing to enhance their attractiveness and capture global clients. Therefore, this study of the Indian context serves several purposes. First, it follows the trends in the offshoring industry. From the academic and practitioner perspectives, studies of a phenomenon as it takes place can yield valuable findings. Second, the Indian case is being imitated by other locations, such as the Philippines and certain countries in South America (Nasscom, 2011), which means that this study can help explain the growth and trajectories of other countries attempting to follow a similar path. As such, this is not a 'study of India', but a recognition that India currently attracts the greatest share of offshore services and is transitioning towards the production of more complex services. It therefore offers fertile ground for studying and understanding the phenomenon, and yields valuable insights for practitioners.

Summary of the research papers

Each of the three papers attempts to examine different but related aspects of capability development with the overall goal of identifying the process of capability development, as well as the mechanisms that support or hinder that development. The first paper adopts the perspective of the service provider and questions how client interaction can influence its

capabilities. The second paper examines the process through which a captive offshore unit upgrades its capabilities when moving from performing standardized activities to handling R&D. The third paper investigates the mechanisms that firms located in a cluster utilize to upgrade their capabilities, and whether and how firm-level capabilities spill over at the cluster level. The three papers are summarized in Table 1-3 and are elaborated upon in the following paragraphs.

Summary of Paper 1: We investigate five cases of offshore outsourcing of advanced service activities, and draw on the literature streams on firm strategy, offshore outsourcing and organization theory to establish our analytical model. We address the gap in our understanding of service-provider firms (Jensen, 2012; Lahiri and Kedia, 2011). More specifically, we distinguish between reciprocal and sequential task interdependence in service production (Thomson, 1967) (independent variables), and we investigate the influence of the two types of task interdependence on three dimensions of capability development (dependent variable). Specifically, we focus on human-capital, organizational capital and management capabilities (Lahiri and Kedia, 2009). We find support for our overall hypothesis that the development of various capabilities is influenced by the characteristics of the service-production process. Our findings show that interactions with clients in the service-production process do not uniformly contribute to the development of human capital capabilities, organizational capital capabilities and management capabilities. Moreover, neither sequential nor reciprocal tasks contribute to the development of all three capabilities, which implies some potential managerial challenges. Interactions with clients in the offshore outsourcing of advanced services support the development of capabilities and have strategic implications for service-provider firms. However, they are not a panacea for the business-development challenges those firms face. Such

interactions offer potential, but significant efforts on the part of the service-provider firms are required to explore and exploit that potential.

Data: Our research is set in the Indian knowledge process outsourcing (KPO) industry. The unit of analysis in this paper is the offshored service-production process in the service provider firm. The five services under study are: measurement sciences (case A), client services (case B), market research (case C), competitive intelligence (case D), and intellectual property and R&D (case E). We conducted 55 in-depth interviews with personnel playing key roles in the production of services, including involved employees, team managers, employee trainers, and knowledge managers. All services contribute to core operations and/or strategic decision-making in the client firms. The services in cases A, B, and C contribute to a service the client sells to an end-customer. The services in cases D and E are not distributed by the client, but used by them for operational and strategic decision-making purposes.

Table 1-3 Overview of Research Papers

	Chapter 2	Chapter 3	Chapter 4
Title (co-authors)	Does Offshore Outsourcing of Advanced Services Develop Capabilities in Service Provider Firms? (with Kristin Brandl and Peter Ø. Jensen).	Old Dog, New Tricks: How does the capability-development process unfold in an offshoring context? (single authored).	Capability development, Proximity, Connectivity: Evidence from the Nascent Digital Creative Industries Cluster in Bengaluru (with Mark Lorenzen).
Research Question	How does the offshore outsourcing of advanced services contributes to the development of capabilities in service provider firms' capabilities	What are the key mechanisms that shape capability-development in an offshore unit?	How knowledge and skills spill over from firms to develop cluster capabilities and cultural proximity?
Methods	Qualitative Case Studies	Longitudinal single case study	Exploratory case study
Findings	Service providers are able to develop in-house capabilities through carrying out sequential and reciprocal tasks. However, sequential and reciprocal tasks do not contribute uniformly to capability development.	Capability development unfolds in a series of phases. Organizational restructuring, collaboration and mentoring support capability development, while managerial resistance, lack of problem solving abilities hinder it.	Subsidiaries build narrow capabilities fast and have modest spill overs to cluster capabilities. Local firms build broader capabilities slowly have greater potential to spill over.

Summary of Paper 2: In an in-depth longitudinal case study, I examine how the process of capability development unfolds as a consequence of relocating R&D activities to a captive unit that is primarily experienced in handling standardized activities. Capability development is constrained by a firm's existing capability base and is, therefore, path dependent (Cohen and Levinthal, 1990; Penrose, 1959). The offshore unit's path dependence is evident in its inability to perform R&D activities. Therefore, the past experience of the offshore unit is salient for the evolution and transition of skills taking place in an offshore R&D unit. I apply a process perspective to this study of capability development (Montealegre, 2002). Moreover, I show that

despite the initial conclusion that the offshore unit was lacking technical capabilities, the onsite unit also needed to align expectations and organizational structure to encourage the learning process. I find that organizational restructuring, ongoing mentoring and collaboration with the external support network support the development of the offshore unit's capabilities, while managerial resistance and a lack of problem-solving capabilities in the offshore unit hinder this development process.

Data: In this paper I utilize a longitudinal case study in a Danish multinational. The case study is conducted within one unit called Biztek. Biztek has a captive offshore unit in India. At the time of the case study in November 2012, the Biztek unit was in the early stages of relocating developmental activities with the goal of gradually moving R&D activities from the headquarters in Denmark to the captive offshore unit in India. I collected data from Biztek's home unit (Denmark) and offshore unit (India). I conducted a total of 38 semi-structured interviews, and observed approximately 20 hours of meetings and participated in video conferences. The interviews pertained to previous and ongoing events in the upgrading of R&D activities helped create a rich understanding of the context, the capability-upgrading process, and differences in perception in the home and offshore units.

Summary of Paper 3: In this paper, we take steps towards combining international business and economic geography research. We complement international business' firm-level analysis with economic geography's network-level analysis, and find that MNC subsidiaries and local service providers utilize different mechanisms to develop capabilities and reduce cultural distance. We examine the nascent digital creative industries cluster in India with the aim of improving our understanding of how clusters evolve and emerge (Manning, Ricart, Rique and Lewin, 2010). We show that both capability development and cultural distance are dynamic

concepts, and that the firm can influence both of these factors. We find that firm efforts to reduce cultural distance and develop capabilities can have a spill over effect in the cluster, and can contribute towards the development of cluster capabilities and increase cultural proximity between the cluster and international markets. Subsidiaries utilize the knowledge within the MNC network, while local firms rely on their personal connections to establish links and learn through their interactions with clients. Furthermore, we find that local firms are active in clusters and engage with local bodies and contribute to the cluster more than subsidiaries that have little to gain through interactions with the cluster.

Data: Our empirical setting is the digital creative industries (DCI), which consists of three broad segments: animation, visual effects (VFX) and games. We focus on the upcoming DCI cluster in Bengaluru, India and conduct at exploratory case study. The DCI cluster focuses almost exclusively on supplying international clients and houses captive offshore units and local service providers. It is estimated that this cluster consists of less than 100 active firms, and is much smaller than the software (ICT) cluster. The nascent DCI cluster is in the process of developing its capabilities, but there are very limited technology and skill spill overs from the extant ICT cluster. We sampled this case purposively on the basis of extant theoretical categories of interest. Studying a cluster at such a nascent stage makes it easier for us to discern relationships and causalities. We conducted 19 interviews from informants with different positions and backgrounds, including several informants with experience in different Bengaluru firms and industry organizations. Our sample also consisted of three local service providers, and four subsidiaries.

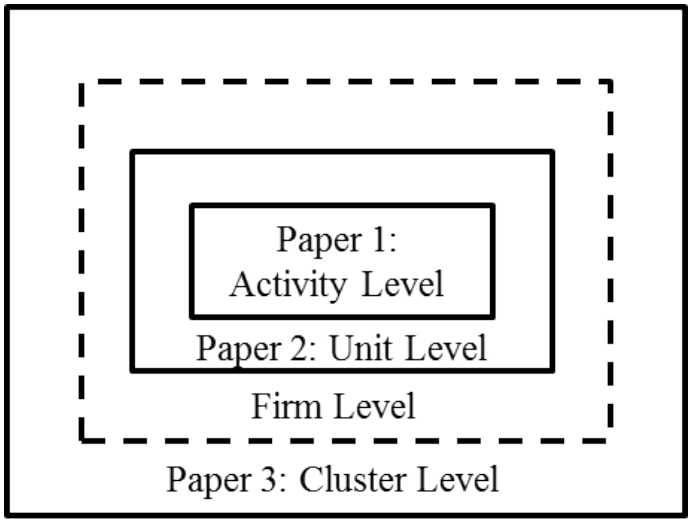
Contribution

The thesis as a whole asks the following question: *What drives or impedes capability development in an offshoring context?* Figure 1.1 highlights the different levels of analysis utilized in this thesis, and the natural progression from the activity level (Chapter 2) to the unit level (Chapter 3) to the firm and cluster level (Chapter 4). In this thesis, I have attempted to extend our understanding of capabilities and I have moved beyond the firm as the level of analysis (Foss, 1997; Un and Montoro-Sanchez, 2010).

The findings resulting from the examination of a captive offshore unit and a local service provider highlight that the mechanisms of capability development differ in these two governance modes. The captive unit deals with issues of managerial resistance and autonomy between the home and the offshore unit. Furthermore, I find that the home unit needs to develop capabilities relevant for managing the relocation of activities. This is similar to extant findings (Maskell et al., 2007; Jensen 2009; Manning et al., 2012). In the service-provider scenario, the client provides linkage opportunities, which the service provider leverages to develop its own capabilities. Compared to the captive unit, the service providers show greater motivation to develop capabilities as this can lead to attracting further clients or entering new markets. In both cases the home unit (or client) have a higher level of capabilities that the offshore unit (or service provider) can benefit from. I also find that the capabilities developed by the captive unit (learning, integrative and technical capabilities) are different from the capabilities developed by the service provider (human capital, organizational capital, managerial and relational). Furthermore, the relational capabilities developed by the service provider, as a consequence of close interaction with the client may be idiosyncratic to that particular relationship, however, they add to the overall capability stock and can increase the reflexivity and understanding of future relationships, thus increasing client satisfaction, and overall performance. The difference

in the types of capabilities developed cannot directly be explained by governance mode as the captive unit and service provider operate in different industries. However, the involvement and extent of interaction differs between the home unit and the client, which can be attributed to the home unit having a greater interest in the offshore unit's capability development as compared to the client's interests in the service provider's capability development.

Figure 1-1 Levels of Analysis



I show that different levels of analysis lead to the identification of different mechanisms and provide a nuanced view of the phenomenon. Specifically, I show that capability development can take place through routine activities, and may spill over to a cluster. Examining capability development at the activity level highlights the role of routine and daily tasks performed by employees, and how they contribute to the operational capability stock of employees and organizations. Though capability development is a deliberate process, the daily functioning within a service provider i.e. client interactions, performance of sequential and reciprocal tasks, are the building blocks to the overall process. By highlighting the respective contribution of sequential and reciprocal activities, I shed light on the importance and relevance

of client selection and interaction. Service providers can shape capability development through the nature of clients they select.

While on the other hand, examining capability development at the unit level brings forth organizational aspects that were of little relevance in the activity-level examination, specifically resource dependence, lack of autonomy and resistance to capability development. Capability development at the unit level has the benefit of identifying organizational processes such as organizational restructuring, training and mentoring to be salient mechanisms, supporting capability development. However, this level of analysis also shows us the reality of a unit operating within an organization, and dealing with challenges such as lack of resources and interdependence. Furthermore examining a captive unit performing standardized activities shows us the limited discretion the unit has in decision-making, and presents capability development as a 'top-down' process.

Finally, capability development at the firm and cluster levels adds to our understanding of how clusters and cluster capabilities emerge and evolve, and enhances our understanding of the concept of cluster capabilities. We show that the firm level capabilities aggregate to the level of the cluster, and firm-specific actions can increase the attractiveness of clusters. By focusing on subsidiaries and local service providers, I highlight and explain the different paths of capability development. Understanding how cluster capabilities are developed has significant implications for understanding MNE strategy, catching-up by emerging economy firms and the positive externalities and agglomeration economies offered by clusters.

Final Remarks

This thesis investigates capability development in an offshoring context. Adopting the view that capability development is a path dependent process, this thesis seeks to understand what drives

and impedes capability development at varying levels of analysis. In doing so it intends to highlight the challenges idiosyncratic to the offshoring context and the mechanisms through which they can be overcome. The three research papers constituting this thesis are presented in the following chapters. In the final chapter, the thesis is concluded by discussing its contributions.

Chapter 2: Does Offshore Outsourcing of Advanced Services Develop Capabilities in Service Provider Firms?[3][4]

Kristin Brandl[5]

Manya Jaura[6]

Peter D. Ørberg Jensen[7]

Abstract: In a multiple case study design we investigate five cases of offshore outsourcing of advanced service activities, and draw on the literature streams on firm strategy, offshore outsourcing, and organization theory to establish our analytical model. We distinguish between reciprocal and sequential task interdependence in service production, and we investigate the influence of the two types of task interdependence on three dimensions of capability development. We examine services at a detailed level of analysis to identify the mechanisms that affect capability development in service provider firms. We find support for our overall hypothesis that the development of various capabilities is influenced by the characteristics of the service-production process. Overall, interactions with clients in the offshore outsourcing of advanced services support the development of capabilities and have strategic implications for service provider firms. Such interactions offer potential, but significant efforts on the part of the service provider firms are required to explore and exploit that potential.

Keywords: offshoring; services; capability development; organizational learning; emerging-market firm.

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[3] First round of revisions at Global Strategy Journal

[4] Earlier versions of this paper have been presented at AIB Annual Meeting 2015; AIB Mini Conference 2015

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INTRODUCTION

When Texas Instruments established a research and development facility in India to develop software in 1985, a new phase in the globalization of services and business activities was initiated. From this point onwards, the continuous global integration of firms and markets included a wide and steadily growing range of services of a technical and administrative nature as well as advanced services, such as R&D, consulting, legal and financial services. Although Texas Instruments incorporated its activities in India into its own global organization, an entire industry of service providers subsequently appeared, many of which originated in emerging markets and developing countries (Reddy, 2011).

Studies undertaken by the Offshoring Research Network (an international research initiative tracking trends of global sourcing of services; c.f. Larsen et al., 2013; Lewin et al., 2009) indicate that offshore outsourcing for advanced services is increasing due to the co-evolution of a range of enabling factors (Lewin and Volberda, 2011). These factors include improvements in the institutional frameworks of host countries, the commoditization of services, advances in IT and communication technologies, the increasing competitiveness of local firms, and the development of capabilities by local firms to attract international clients (Lewin and Volberda, 2011). However, we do not know much about the capabilities of service provider firms. Despite the academic community's significant interest in offshore outsourcing in the past decade, the extant research predominantly focuses on client firms, such that key aspects pertaining to service provider firms remain understudied topics (Jensen, 2012; Lahiri and Kedia, 2011). There has been significant focus on governance mode choice and the comparison between offshore outsourcing and captive (i.e. firm-internal) offshoring (Chen, 2009; Hutzschenreuter, Lewin and Dresel, 2011; Mudambi and Venzin, 2010; Nieto and Rodriguez,

2011), location choice for offshored activities (Demirbag and Glaister, 2010; Hätönen**,** 2009; Liu, Feils and Scholnick, 2011), and the overall questions of interest have concerned the efficiency and financial effects of outsourcing (Bertrand, 2011; Bertrand and Mol, 2013; Doh, 2005; Grimpe and Kaiser, 2010). Furthermore, service providers have largely been considered as subordinate players in the client-service provider relationship (notable exceptions include for example Luo, Wang, Zheng and Jayaraman*,* 2012). In contrast, this study positions the service provider as a central and equal partner in offshore outsourcing, and adopts an activity-based perspective. The purpose of our study is to investigate *how the offshore outsourcing of advanced services contributes to the development of capabilities in service provider firms' capabilities.* Here, advanced services denote what UNCTAD (2004) categorizes as "high-skill services" which is "the most creative and skill-intensive end of offshored services" (UNCTAD, 2004: 151), and below we explain our capability construct in more detail.

We study two types of advanced services at the activity level, and examine how the production of these services influences the development of capabilities in the service provider firms. Adopting an activity-based view allows us to understand the strategic decisions and actions taken by managers who are close to the clients and their employees (Whittington et al., 1999; Zenger and Hesterly, 1997). The activity-based view focuses on the day-to-day and operational details of organizational work (Whittington, 2003) and can therefore highlight the specific actions through which value is created for the organization. Recent research on the organization and coordination of offshored activities claims that globally distributed or relocated activities are characterized by varying degrees of interdependence (for example, Kumar et al., 2009; Srikanth and Puranam, 2011). The performance and outcome of tasks performed in the offshore location are affected by, or need interaction with the outcome of the task performed at

the onsite location (Stringfellow et al., 2008). Therefore, based on Thompson's (1967) seminal definitions of task interdependence in firms' production processes, we distinguish between two types of service-production processes that are characterized by sequential and reciprocal task interdependence.

To address the capability development aspect in our research question, we chose to use Lahiri and Kedia's (2009) framework of organizational capital capabilities; who categorize offshoring-related service provider capabilities into three broad groups: *human capital capabilities, organizational capital capabilities,* and *management capabilities*. The capability construct can be difficult to operationalize (Un and Montoro-Sanchez, 2010), and there are few studies that have measured the capability construct (for example, Ethiraj et al., 2005; Lahiri and Kedia, 2009; Parida et al., 2013). In their study, Lahiri and Kedia (2009) show three capabilities that positively affect performance in an offshore outsourcing context, and are instrumental in the performance of advanced services as they relate to the various facets (individual, relational, organizational) of advanced services. Using this framework, we are able to provide a fine grained understanding of the relationship between service characteristics (degree of interdependence) and nature of capability developed (human capital, organizational capital, managerial). Overall, we hypothesize that as a result of the different service types and the demands they make of the service-production process, the service provider can benefit from the development of human capital capabilities, organizational capital capabilities, and/or management capabilities. The process of developing capabilities in service provider firms does not start from a clean slate. Arguably, as a condition to be chosen by the client, service providers are expected to have pre-existing knowledge bases, experience in working with (international) clients, and in-house capabilities (Pant and Ramachandran, 2012; Weigelt, 2009). Nonetheless,

despite knowledge and technical skills, they may lack client- or relationship-specific capabilities, and domain-specific and architectural knowledge (Ethiraj et al., 2005; Manning, Lewin and Schuerch, 2011). Therefore, the scope of our research extends to the capabilities developed through various interactions between the service provider and the client in addition to the pre-existing capabilities possessed by the service provider.

Through a study covering five cases of service production outsourced offshore, including two cases of sequential task interdependence and three cases of reciprocal task interdependence, we find that service providers learn from and leverage their clients' existing knowledge and expertise. As a result, they enhance their own capabilities in some domains. Our findings show that the production of services with sequential task interdependence leads to the development of organizational capital and managerial capabilities. Furthermore, we find that service production based on reciprocal task interdependence leads to the development of human capital capabilities and managerial capabilities. However, neither type of service production contributes simultaneously to the building of all three types of capabilities. We assume that all dimensions of this trinity of capabilities are important for sustaining and developing future competitiveness. Therefore, we argue that the absence of positive inputs related to all three capabilities leads to a set of firm-strategic challenges for service providers. Theoretically, we contribute to the thematic literature in the field of offshore outsourcing of services: we adopt the under-researched perspective of the service provider firm and we add to the evolving research stream on emerging market firms. In addition, we contribute to the literature on firm resources and capabilities by shedding light on the development of heterogeneous firm capabilities, and we discuss the linkages between this literature in strategic management and the research on global value chains.

The remainder of this paper is structured as follows. First, we discuss the relevant literature on service types and characteristics, firm resources and capabilities, and offshoring, and how these literature streams are related. We use this discussion to design the analytical model for the study. After explaining the applied research methods, we analyze the generated empirical data, discuss three resulting propositions, implications for future research, and we highlight strategic implications for firms.

2.1 THEORETICAL FRAMEWORK

The role of activities and tasks in offshore outsourcing

The extant literature on the global offshoring and outsourcing of services predominantly focuses on an aggregate level, and discusses 'services' in general terms without considering the specific nature of service activities (Doh et al., 2009; Jensen, 2012; Jensen and Petersen, 2012). Studies taking a more dynamic and activity-driven approach have predominantly focused on value chain activities (see Kedia and Mukherjee, 2009; Kumar et al., 2009; Mudambi and Tallman, 2010; Stringfellow et al., 2008) rather than individual services.

In strategy research, a number of scholars have argued for a shift of the analysis level from macro to micro (activity). These scholars argue that more emphasis should be placed on the motives and activities of individuals, and on the nature and characteristics of value chain activities and specific tasks (Foss, 2009; Johnson, Melin and Whittington, 2003; Priem and Butler, 2001; Rouse and Daellenbach, 1999). These arguments also apply to the context of offshore outsourcing, as the nature and characteristics of activities may shape the outcomes. In order to identify these features, we utilize Thompson's (1967) framework in which the specific tasks involved in the production of services are distinguished according to the type of

interdependence between tasks, which can either be reciprocal or sequential. This framework allows us to take a more disaggregated analytical perspective in which we consider the more specialized interaction and division of labor between onshore and offshore units and workers. We consider each activity in the value chain as consisting of a number of specific tasks that in combination constitute the activity in question (for a discussion on the distinction between value chain activities and tasks, see Jensen and Pedersen, 2012)

Interdependencies in offshore outsourcing

The task-interdependence constructs and corresponding theoretical frameworks were developed in the 1960s and 1970s in the context of co-located factory work and simple office work. A task is said to be interdependent when the outcomes of actions taken by 'A' depend in some respect on the actions taken by 'B' (Gulati, Lawrence, and Puranam, 2005; Heath and Staudenmayer, 2000; Thompson, 1967). Prior research on offshoring argues that tasks that are relocated to offshore locations are often interdependent. For example, Srikanth and Puranam (2011), and Kumar et al. (2009) argue that as the outcomes of distributed work are integrated into a final product, the operational aspect of the distributed work is interdependent: 'Given that these partitioned tasks and sub-tasks are part of the overall work of the organization, and ultimately contribute to organizational performance, they are interdependent' (Kumar et al., 2009: 644).

Thompson's (1967) classic typology of task interdependence distinguishes among three types of interdependence: pooled, sequential, and reciprocal. In pooled task interdependence, each actor or work unit performs its task independently, and no actors need to be aware of other actors or be concerned about subsequent pooling. In situations where advanced services are relocated, there are multiple feedback loops and iterative processes, which represent sequential

and reciprocal task interdependencies, respectively. Pooled task interdependencies often exist in the context of manufacturing or the relocation of standardized services. However, our focus is on advanced services that are crucial to the client. It is highly unlikely that a service provider would perform tasks independent of the client when the outcome of those tasks is of significant importance to the client. In other words, we utilize sequential and reciprocal activities because the offshore unit does not conduct services independent of the onsite unit.

Reciprocal task interdependence

Reciprocal task interdependence is characterized by a high level of uncertainty about how best to deliver intended outcomes and a high level of interdependence among members of the workforce, regardless of their spatial locations. The problem-solving process is iterative and cyclical, as perceptions of the nature of the problem and adequate solutions may change during the execution of the task. Examples include work carried out in hospitals, educational institutions, and professional-services firms active in medicine, law, IT, architecture, and engineering. Thompson's (1967) illustrative example of reciprocal task interdependence is a medical doctor treating a patient. In this scenario, the diagnosis of the disease comes first. In other words, the problem is defined. That process is then followed by the treatment, which represents the solution. However, if the treatment fails to cure the disease, then the diagnosis/problem definition must be revisited and revised in order to provide a new/revised solution. From an offshore outsourcing perspective, this means that task execution is a dynamic process with many feedback-loops between onshore and offshore units.

In cases of reciprocal task interdependence, the work process must be carefully managed, and continuously coordinated and integrated among the various locations in order to be effective. This high degree of task interconnectedness makes it difficult to distinguish clear

interfaces and boundaries between tasks within the process of producing the services. Moreover, reciprocal task interdependence reflects services that are highly dependent on the judgment of individuals and on tasks that need to be executed simultaneously. Due to the iterative nature of the work, there is no clearly defined boundary as to when tasks start and end.

Sequential task interdependence

In contrast, tasks have more modularized and clearly defined boundaries in sequentially interdependent service-production processes, where one task depends on the completion of the previous task in the sequence. Thompson (1967) uses a factory assembly line to illustrate this work process: *'*the original symbol of technical rationality, the mass production assembly line, is of this long-linked nature. It approaches instrumental perfection when it produces a single kind of standard product, repetitively and at a constant rate' (Thompson, 1967: 15-16). While Thompson's example describes a manufacturing scenario, the execution of many contemporary services follows the same principles (Jensen and Petersen, 2012; Karmarkar, 2004; Sako, 2006).

In this case, both the problem and the related solution are understood and clearly defined from the outset of the work process. Employees responsible for task execution must possess the skills needed to complete the work process in a stable, reliable, and transparent manner. They are required to comply with codified instructions, not to develop individual, case-by-case solutions. Table 2-1 summarizes the central features of reciprocal and sequential tasks.

Table 2-1: Task features in reciprocal and sequential task interdependence

Central task features	Reciprocal task interdependence	Sequential task interdependence
Relation between problem definition and solution definition	Iterative and mutually dependent development of problem and solution	Clearly defined problem and related solution
Coordination and communication needs between onshore and offshore units/workers	High, ongoing need for coordination and communication	Limited, aside from initial instructions or training
Possibility for replication	Individual, case-by-case solutions; limited possibility for replication	Replicable and scalable processes
Importance of individual judgment, combinative capabilities, and experience	High	Low

Capabilities in offshore outsourcing

Research on organizational capital capabilities is rooted in theoretical work on the resource-based view of the firm (Barney, 1991; Penrose, 1959), including research on the development of resources and capabilities (Dierickx and Cool, 1989; Eisenhardt and Martin, 2000; Teece et al., 1997). We adopt Barney's (1991) definition of capabilities as 'the ability of firms to use their resources to generate competitive advantages' (Barney, 1991: 647). This understanding of the capability construct denotes that learning, experiences, resources and routines are inputs into capabilities (Zollo and Winter, 2002).

A few studies have explored the role of capabilities in the context of offshore outsourcing. One example is Ethiraj et al. (2005), who examine two specific types of capabilities in offshore outsourcing: client-specific capabilities and project-management capabilities. Some research has emphasized relational capabilities and social exchanges that relate to the offshore outsourcing context with its client-provider relationship (see Vivek et al., 2009). Such research argues that in certain relationships, such as outsourcing relationships, relational exchanges between a client

and a provider foster the transfer of knowledge and intangible assets, and can lead to the development of joint capabilities (Vivek et al., 2009). Relationship-specific capabilities include the ability to configure resources in a way that meets client requirements, leading to enhanced exchanges, efficient use of resources, and the development of trust and commitment between partners (Nooteboom, 2004). Consequently, clients benefit from improved performance and lower coordination costs, while the service provider benefits from general learning, which may lead to the development of in-house capabilities (Vivek et al., 2009).

As a supplement to the relational view of capability development, research has examined the joint development of knowledge and capabilities between clients and providers. During the course of a client-service provider relationship, the service provider may develop knowledge and capabilities that are essential to the client and the service provider can adapt to the needs of the client and develop capabilities that cater to those needs (Barthélemy and Quélin, 2006). Thus, the client might affect the capabilities of the service provider and vice versa.

Human capital capabilities, organizational capital capabilities, and management capabilities

In order to study the in-house capabilities of service providers in an offshoring context, we base our approach on Lahiri and Kedia's (2009) design. These authors examine the significance of pre-existing capabilities possessed by a service provider and the impact of those capabilities on the performance of relocated services. We use a modified version of Lahiri and Kedia's (2009) framework of *human capital capabilities, organizational capital capabilities,* and *management capabilities* as the basis for our study. Lahiri and Kedia (2009) view capabilities as an antecedent to firm performance, while we posit capability development as an outcome of performing services for clients. We then consider whether and how these capabilities are further

developed in service-provider firms as a result of offshore-outsourcing relationships and interactions with the client firm in the production of services. We define capability development as a change or improvement in the existing stock of capabilities (human capital, organizational capital and management) present in the organization, through a process of learning and deliberate efforts. We extend this discussion to include the two types of task interdependence, as we suggest that the services-production process influences these capabilities. Our approach falls within the strand of literature that adopts a dynamic view of the role of firm capabilities, as we study the development of existing capabilities.

Human capital capabilities reside within individual employees in the firm, and are closely related to analytical, technical, and quality-related aspects of the services. Broadly speaking, the human capital capabilities of a firm rest on a foundation composed of the formal educational backgrounds of individuals, which contribute analytical, technical, and language skills; professional experiences; and firm- and activity-specific knowledge (Hatch and Dyer, 2004; Lahiri and Kedia, 2009). Such capabilities are particularly important in advanced services, which incorporate both explicit and tacit knowledge, as well of knowledge of routines. These types of knowledge are not easily substitutable or transferable (Almeida, Song, and Grant, 2002; Starbuck, 1992; Szulanski, 1996), and are important for understanding the problem-specific needs of the client (Lahiri and Kedia, 2009; Stabell and Fjeldstad, 1998).

At the aggregate level of the firm, organizational capital capabilities result in the collective behavior of employees, and in employees' use of institutionalized knowledge and routines combined with input from clients in the production of offshore-outsourced services. The possession of organizational capital capabilities is crucial for service providers, as those capabilities enable them

> ‘to utilize their accumulated codified knowledge-base in better serving their clients' sourcing needs through use of various project-related documents and manuals, learning obtained through feedback from clients on earlier projects, unique methodologies and adaptive technologies developed and found useful in prior contracts, organization wide norms that stress efficient practices, processes, and programs, and cultures that promote innovativeness in providing new and superior services’ (Lahiri and Kedia, 2009: 213).

The importance of such capabilities is broadly discussed in the literature on strategy and organization. This stream of literature mentions the ability to combine capabilities at the organizational level as a foundation for the creation of new capabilities (Kogut and Zander, 1992); the importance of higher-order capabilities, such as architectural knowledge, as a foundation for value creation (Henderson and Clark, 1990); and the possession of organizational capital capabilities as a source of innovation (Subramaniam and Youndt, 2005).

Finally, management capabilities assist in the assembly and deployment of resources in order to fulfill contractual obligations. In our definition of management capabilities, we follow the definition utilized by Lahiri and Kedia (2009) and Desarbo et al. (2005). The management capability construct refers to firm-level capabilities that integrate and support various skills related to logistic systems, cost control, financial and human resources, profitability and revenue forecasting, and marketing planning. This construct fulfills two central overall objectives: serving client needs and generating new business. From a business-development perspective, service-provider firms that possess strong management capabilities should be able to generate business from new clients in international markets (Ethiraj et al., 2005). As Lahiri and Kedia (2009: 213) point out:

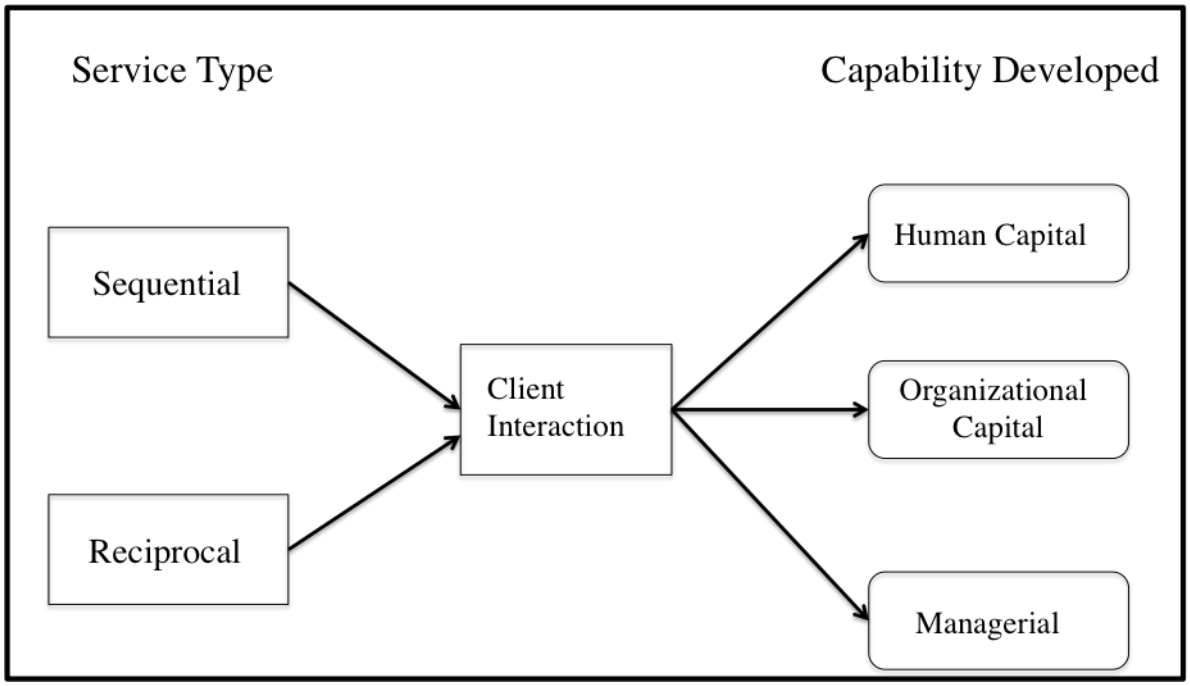
> ‘higher management capability should enable providers to better manage i.e., bundle and leverage various firm-level resources and capabilities in attaining superior performance’.

Analytical model

We are now able to develop an analytical model (see Figure 1) that combines the above-discussed constructs, and shows how sequential and reciprocal services contribute to the development of capabilities. In line with our theoretical framework discussion, the first component of the model is the type of services, which are characterized by degree of interdependence - either sequential or reciprocal. A comparison between reciprocal task interdependence and sequential task interdependence highlights differences in the two types of services and the coordination demands they place on the client and service provider, thus resulting in varied influence on capability development.

The second component in our model is client interaction. There are fundamental coordination differences between the individuals involved, differences in the extent and depth of knowledge transfer required and the application of individual judgment skills. The two types of activities place different demands in the execution of tasks. The final component of the model is the capability variable (the dependent variable) and its three dimensions: human capital, organizational, and management capabilities.

Figure 2-1 Analytical model



2.2 METHODS

Research approach and setting

We apply a qualitative, multiple case-study method (Eisenhardt, 1989), which allows us to gain a detailed understanding of the development of capabilities as well as the factors, actors and processes that influence their development. In order to provide such a detailed perspective, we conduct a cross-case analysis that allows us to use theory and data in an iterative and alternating manner.

Our research is set in the Indian knowledge process outsourcing (KPO) industry. Our country choice was influenced by the crucial role played by Indian KPO providers. Indian KPO providers have emerged as pioneers in areas such as analytics, data management, and business, legal and market research (Nasscom, 2011). Furthermore, the KPO industry forecasted

rapid growth at 22 percent per annum from 2010 until 2015 (Nasscom, 2011). Currently, India attracts the bulk of global KPO, over 70 percent, and this success model is being replicated in Latin America, Eastern Europe and South East Asia (FinancialExpress, 2014). The rapid growth in this industry and the potential for learnings that are relevant on a global scale make India the obvious selection for our study.

The unit of analysis in this paper is the offshored service-production process in the service provider firm. We focus on subsequent capability developments within the provider firm that are influenced by client interactions and by the type of task interdependence. We study five cases of offshore outsourced service production, and in all cases the service provider performs *advanced services*, i.e. high-skill services involving the most creative and skill intensive type of service work (UNCTAD, 2004). In view of the Indian context of the study, our experiences from previous research project and our ongoing dialogue with client and service provider firms engaging in offshore outsourcing we may consider the five case firms as typical cases of advanced services that are outsourced offshore. In his discussion on strategies for selection of cases in qualitative research, Flyvbjerg (2006) describes such cases as "paradigmatic cases". This implies that findings from the case in question can: "develop a metaphor or establish a school for the domain that the case concerns" (Flyvbjerg, 2006: 230). In this study the relevant "domain" concerns offshore outsourcing of advanced services to service provider firms in emerging markets. However, as Flyvbjerg (2006) notes it is difficult to know beforehand whether a case truly is "paradigmatic", and whether and to what extent the lessons learned from studying the case can be generalized beyond the boundaries of the case. In view of this limitation we do not claim that our findings will be readily generalizable on the basis of our five cases. Nevertheless, an important quality of a multiple case study design is that it shows when a

finding occurs in more than one case. This, in turn, can indicate that this finding is not merely an idiosyncratic observation that does not hold any value, except for the case itself, and it therefore could point at something that potentially is a more widespread phenomenon. It is in this context that we later in the paper develop a set of propositions which we present as statements about possible causal relations that can form the basis for further investigation in studies with a larger number of observations than ours.

Despite the common characteristic of being advanced services, the studied services reflect various levels of task interdependence, and can be categorized as either sequential or reciprocal tasks. The five services under study are: measurement sciences (Case A), client services (Case B), market research (Case C), competitive intelligence (Case D), and intellectual property and R&D (Case E) (see Table 2-2 below). Cases A, B, and C involve an Indian multinational that offers business-process and knowledge-process services (BPO and KPO, respectively). We focus on the firm's KPO department, which has representative offices and production sites in India and around the world; we refer to this firm as 'ServiceNow.' Cases D and E involve a service provider that focuses on KPO services. The firm has sales representatives around the globe who travel to client locations. It also owns production sites in India, Chile, and Romania. We call this firm 'COVALU.'

Table 2-2 Case descriptions

Charac-teristic	Case A	Case B	Case C	Case D	Case E
Service	Measurement science	Client services	Market research	Competitive intelligence	Intellectual property and R&D research
Service description	Statistical analysis and global trend estimations; client provides data	Analysis of and insights into business issues; client provides data	Analysis of and insights into markets; data needs to be generated	Analysis of and insights into competition and business environment; data needs to be generated	Analysis of and insights into global intellectual property and R&D activities; data needs to be generated
Activity type	Sequential	Sequential	Reciprocal	Reciprocal	Reciprocal
Firm name	ServiceNow	ServiceNow	ServiceNow	COVALU	COVALU
Client industry	Multimedia	Media consulting	Business consulting	Chemicals	Chemicals
Client location	US/Europe	US	US	Switzerland	Switzerland
Year of offshoring	2009	2010	2009	2006	2008
# of interviews	14	8	8	12	13
Interviewee positions	- Business analyst - Manager (Client, Delivery, Division, HR, Partnership, Regional, Service, and Transition) - Trainer	- Business analyst - Manager (Client, Delivery, Division, HR, Regional) - Trainer	- Business analyst - Manager (Client, Delivery, Division, HR, Team, Transition) - Trainer	- AVP - Business analyst - Division, HR, Team) - On-side representative - Trainer	- AVP - Manager (Division, HR, Team, Transition) - On-site representative - Research associate - Trainer
Required educational background	Statisticians, researcher,	Commerce graduates, media experts, statisticians	Business analysts, economists	Chemical engineers, business analysts	Chemical engineers, lawyers

In order to ensure consistency with our advanced services construct and the distinction between reciprocal and sequential task interdependence, the authors carefully studied the service activities, the skills and roles of employees executing the services, the type of knowledge utilized, the extent of required knowledge transfers, and the type of data and inputs required for the production of the services. Two cases (A and B) fall within the category of sequential task interdependence, while three cases (C, D, and E) are characterized by reciprocal task interdependence. The cases that fall under the first category reflected a production process that could be distinguished into stages that were executed sequentially. After the task was executed, activities were handed over to the next employee in line who then continued with the service production. Employees were predominantly young, newly educated, and newly hired without much work experience and the client provided data for the service production to them. While the focus was on the final service delivery in sequential services, reciprocal services placed also a strong emphasis on production process activities. Reciprocal services required more independent judgment by the employees and data was neither provided nor easily accessible. The employees producing these services had experience in collecting and generating data, which was required in the service production.

All services contribute to core operations and/or strategic decision-making in the client firms. The services in cases A, B, and C contribute to a service the client sells to an end-customer. The services in cases D and E are not distributed by the client, but used by them for operational and strategic decision-making purposes.

Data generation

Data were predominantly generated through primary data collection from semi-structured interviews with personnel playing key roles in the production of services, including involved employees, team managers, employee trainers, and knowledge managers. The interviews lasted an average of 45 minutes, with interview lengths ranging from 30 minutes to 1.5 hours. In total, we conducted 55 interviews between October and December 2011. All interviews were recorded, transcribed, and analyzed using NVivo 10. In addition to the interviews, secondary data in the form of internal documents and publicly available information were used to triangulate information (Yin, 2003).

Validity (construct/credibility, internal/integrity, and external/transferability) was ensured in several ways. The data-collection process (e.g., interviews with top-level managers, trainers, knowledge-platform managers, and involved employees) and the analysis of various data sources allowed us to gain vast insights into various organizational levels. These activities also enabled us to gain an understanding of various organizational topics related to knowledge platforms, management, training, and service production, such as production processes, challenges, employee activities, and the offshoring process. For all cases, the data were purposefully generated to represent common reciprocal and sequential service-production processes within each type of service production. Although only one researcher conducted the interviews, the transcribed interviews were shared, collectively coded, discussed, and analyzed by all authors.

2.3 DATA ANALYSIS

Within and cross-case analysis

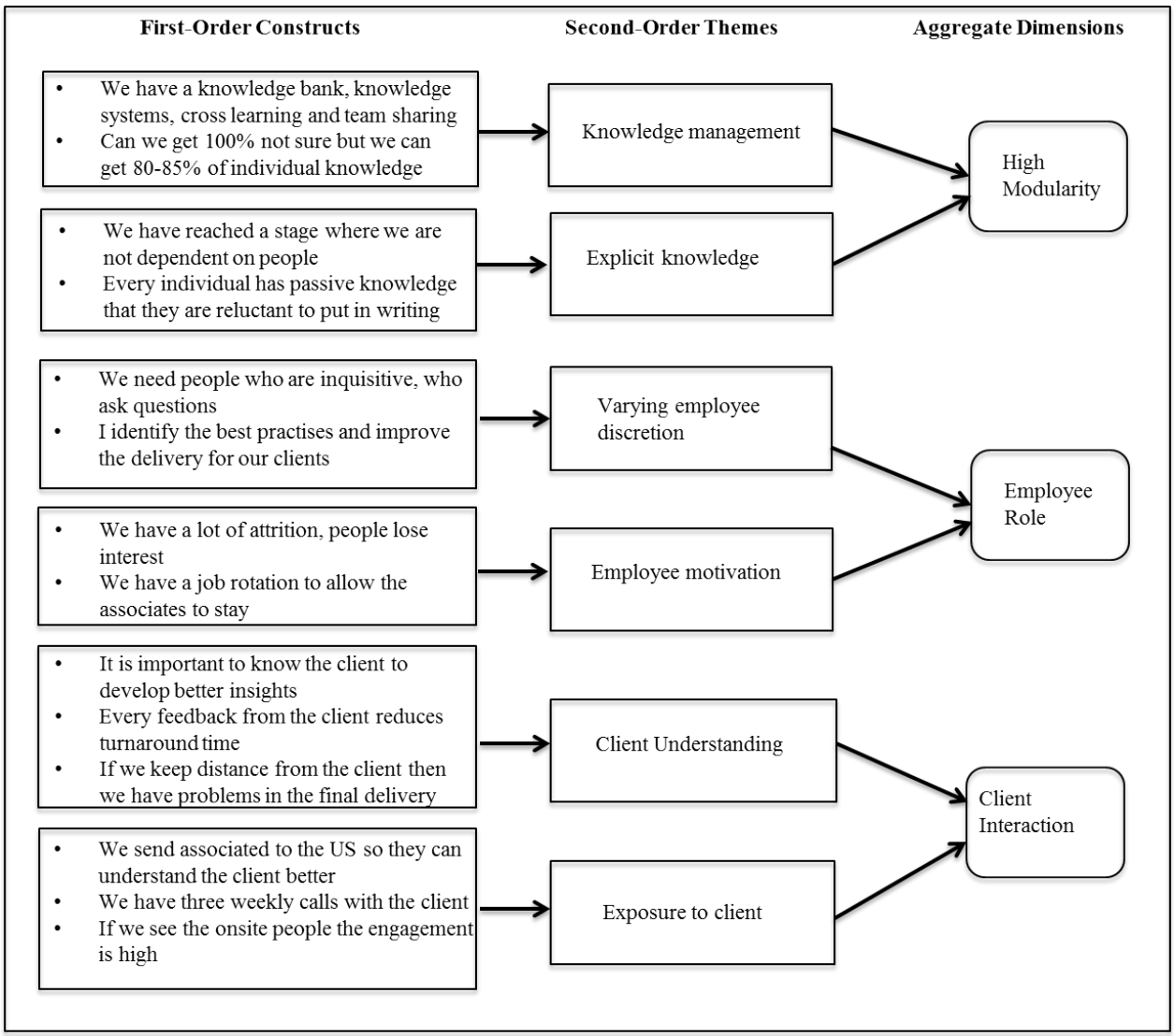
In order to study the development of the service providers' organizational capital capabilities, we analyzed the production of services at the offshore location. We grouped the services according to their features into sequential and reciprocal task interdependent services. We analyzed the individual case followed by a cross-case analysis in order to identify changes in the chosen cases, as well as common patterns within and across the two types of task interdependence. The cross case analysis allows us to identify the differences and commonalities of the two types of service production. The services are presented according to their type of task interdependence—first sequential services (cases A and B) are discussed, followed by reciprocal services (cases C, D, and E). The investigation was informed by the theoretically derived models discussed above, which are based on the three capabilities: *human capital capabilities*, *organizational capital capabilities*, and *management capabilities* (Lahiri and Kedia, 2009).

Based upon our theoretical understanding of capability development and interdependence, we identified some key areas of interest: the extent of uncertainty and modularity related to the different activities, the degree of interaction with the client and the role individual employees played. We focused on the routines involved in carrying out the sequential and reciprocal tasks. By conducting the analysis simultaneously we were able to identify and compare between routines, degree of modularity, degree of uncertainty and extent of client interaction. The analysis helped in the development of a data structure (Suddaby, 2006) consisting of first-order constructs, second-order themes and aggregate dimensions (see Figure 2-2) (Corley and Gioia, 2004; Rerup and Feldman, 2011), which were identified using three questions: (1) What role do routines play in capability development? (2) How does client interaction and employee engagement influence capability development? (3) And how does the service provider shape

their own capability development. With this approach we were able to combine the capability development literature with our understanding of service providers and move between data and theory.

The data analysis section below presents and summarizes the empirical data in relation to the three dimensions of capability development, and the following discussion section provides our interpretation of the data (Pratt, 2008).

Figure 2-2 Data overview and coding structure



The development of capabilities in services with sequential task interdependence

Human capital capabilities. In Cases A and B, young and newly hired statisticians, media experts, or commerce graduates produce the services. A high level of education is needed to apply and use statistical analysis or to project the development of industries—common tasks in both services. Data needed to evaluate the progress and development of the industry is largely provided to the analysts. The analysts need to have statistical skills, as well as skills in Excel or similar data-management programs that allow for data analysis. In addition, they need industry-related or country-related information. The individual analysts use their own knowledge and critical-thinking skills when analyzing the results of their applied statistical analyses in order to predict the development of the industry in relation to the end-customer, as in Case B. Therefore, the analysts need to understand the end-customers' industries and products, as well as the market conditions, which includes country-specific factors.

As a consequence of the characteristics of these two cases, the involved employees argue that providing the services is not challenging, resulting in decreasing motivation due to the restrictions on their personal progress and individual learning. As a consequence, the mostly young, often newly hired, and initially highly motivated employees frequently leave the company after a short period of time to take on more challenging positions or to move to other firms. As one respondent indicated, 'we have a lot of attrition because people lose interest. […] Generally, people get better with a problem, or they get bored and then some of them move on' (Training Manager, Case A).

The high employee turnover results in unstable working environments and many changes in team dynamics. In both cases, ServiceNow struggles to retain a constant employee base. Thus, in order to ensure efficient and undisturbed communications with the client, only members of management or the team leader communicate with the client. Executing employees

and analysts seldom have direct contact with the client. Due to the characteristics of the services, the further development of human capital resources is limited as sequential services do not require development of or learning among the executing employees. To address the limited developmental opportunities and reduce the high attrition rate, ServiceNow attempts to make the jobs more attractive through internal rotations or position improvements.

Organizational capital capabilities. The production of the services in Cases A and B is sequential and data input from the client is required. In Case A, employees use electronically collected data for statistical analysis in order to highlights trends and developments in the purchasing behavior of global customers (the client's end-customers). To analyze this data, statistical methods that allow for projections of industry developments are used. The client initially produced the service onshore and had an established analytical approach before offshoring the activities to ServiceNow. Consequently, various documents and standard operating procedures (SOPs) were transferred from the client to the service provider in the initial stages of the collaboration. ServiceNow did not change these production activities and set procedures, such that the services are produced as they were prior to offshoring.

Similarly, the offshored services in Case B were produced internally before they were relocated. Data are provided by the client and complemented with statistical data from the service provider in order to make well-informed projections of industry and product developments for the client's end-customer of the client firm. In this case, ServiceNow took over the activities without changing the production of the services and integrated them into its own organizational context without significant changes.

The intention in both cases is to document (new) processes in order to overcome knowledge lost through, for example, employee attrition. The Client Head in Case B outlined this aim, stating: 'at the end of the day, will we get 100% of the information documented? Probably not. Can we get 80% to 85% documented? Yes, but the goal is to try to get to 100%. Every individual has something that they know and need to share.' Such documentation is central for the services, which are based on statistical models that remain constant.

In order to share these documents and production processes, ServiceNow uses an online operating platform: 'we have a knowledge-management system and team sharing sessions. Anyone who learns something new shares it with the team. It is documented and kept in our knowledge-management system, which can be accessed by anyone. Meetings and line sessions are organized to ensure cross learning […] so that we are not too dependent on one person' (Regional Delivery Head, Case B). The platform allows for an easier and more efficient transfer of documents. In line with the integration of services into the organizational context, ServiceNow uses the SOPs and documents provided by the client, and integrate procedures into firm processes that can then be transferred to other contexts and clients.

Management capabilities. In Cases A and B, the management of the services mainly focuses on managing human resources to ensure task execution. Due to the relatively high attrition rate in both cases, staffing activities, hiring, and training are the prevailing management responsibilities. Although the client has no influence on staffing issues or employee management, ServiceNow carries out its training with some recognition of and involvement from the client. The Head Trainer in Case A explains the training: 'The client has gathered a significant amount of knowledge over a span of 20 years. We are unlikely to be able to

compress that knowledge and give it to a new hire who is a fresh graduate or someone with only a few of years of experience through classroom training. Therefore, the objective is to introduce new hires to the concepts and help them get familiarized. We aim for about 20% of the knowledge transfer to occur during that [first] stage. […] That one-week session gives new employees an overview of the company. […] Then we take the staff into the mitigation—exactly what the team would be doing.'

Other management activities involve data input and delivery of the services. ServiceNow receives data from the client and is highly dependent on this interaction with the client. The data input is predominantly handled on the management level and on occasion requires intense communication between the two parties. After the service is produced, the delivery requires a similar intense interaction with the client. The analyzed data are documented and distributed to the client, which is usually followed by a discussion of the findings between the two parties.

The development of capabilities in services with reciprocal task interdependence

Human capital capabilities. All three cases of reciprocal services (Cases C, D, and E) require individual experts for the production process. These experts use their skills, educational background, and experience to critically analyze the business environment in the respective field and deliver the service, which is often in the form of reports or presentation slides. All information needs to be gathered by the analysts, who have to judge the information according to its relevance and importance for the services, as no data are provided by the client. To ensure further development and provision of the knowledge necessary for high-quality service production, the client communicates and builds a personal relationship with the service providers' executing employees and analysts. For example, in Case C, onshore and offshore employees engage in weekly phone calls to strengthen the relationship and enhance the quality

of the service. As one analyst explains: ‘There are three weekly calls: one for project discussion, one for industry discussion, and one for getting to know each other. […] For the industry discussion, I need to present a topic on what is happening in the music industry? Or what are the latest challenges and issues? […] The project discussion is about the things I have done, how much I have completed, the challenges I am facing, and whether there are other kinds of reports that could help me to furnish better information and insights. The getting to know each other calls are about how I can accommodate the client, how the client can accommodate me. They are on a personal level. These are the ways in which I develop a relationship with the client, and I am able to develop much better insights. Every feedback the client gives me helps me to improve and the turnaround time has fallen substantially’ (Case C).

Similarly, in Case D, the responsible client manager regularly travels to the offshore location and an offshore employee travels to the client’s location at least once per year. Both interactions are viewed as helpful for the client-provider relationships, and enhance the level of understanding between the two parties.

In all cases, the management teams as well as the executing employees emphasize the need for regular and personal contact between the client and the executing employees and the importance of personal development to deliver high quality in results. In addition to improved performance, personal contact with the clients keeps the offshore employees motivated and involved in the daily operations, which also contributes to better service quality. The sense of belonging to and integration in the team is enhanced when the client integrates the service provider into its own organizational context and provides access to internal databases.

Organizational capital capabilities. As the services are unique and context dependent, standardization only exists in relation to delivery formats, such as delivery design and approach. Content and production processes are not suitable for standardization in any of the three cases. Therefore, the service providers develop their own unique approaches to service production; this development approach is limited and not transferrable to other contexts across ServiceNow and COVALU. Thus, offshored services are based on the specialized context of client firms and highly dependent on the judgments of the experts producing the service. Only generic and process-related information is transferred, documented, and shared through firm-internal knowledge-sharing platforms.

Management capabilities. Reciprocal services are dependent on individual employees who produce the services. Consequently, the assembly and development of human resources is important. Employees are hired based on their educational background, experience, and industry- or service-related knowledge. In all three cases, the employees are trained to ensure they accurately understand the equally important aspects of service production and client context. Consequently, the client supports the training and development of service provider employees. For example, in Case C, service provider employees of ServiceNow are trained by the client and spend several weeks shadowing the client's employees in order to understand the firm's specific requirements, context, and service-related execution processes. A Team Manager in Case C explains: 'we send the associates to the US or other areas so that they can get to know and understand the client better'.

Due to the regular contact between the client and the service provider, the deliverables are more tailored to the client's needs, and the feedback loop is fast and efficient. An Analyst in

Case C argues that: ‘we produce a draft before the final deliverable. I send the client my deck, so that they can review it. They come up with feedback and I incorporate it. Then, with the final deliverable, I need to walk the client through the entire presentation. This is how the entire transition happens and now I am able to handle all of this on my own.’ These meetings are used to improve service quality and to derive insights regarding potential new service offerings and are attended by the client’s sales representatives.

2.4 DISCUSSION

Propositions

In this section we interpret the findings of the study in relation to the three dimensions of capability development in service provider firms. In view of our case-based research design, i.e. an approach that is based on few observations but one that provides us with rich data, we find it appropriate to summarize the main observations in three propositions. Our propositions are intended as statements that can be tested in future studies with a larger number of observations. After analyzing the influence of the two types of task interdependence separately, we are able to show how offshore outsourcing of advanced services contributes to the development of service provider capabilities and compare how sequential and reciprocal services contribute to the development of these capabilities.

We found that the production of services with sequential task interdependence did not lead to the development or enhancement of human capital capabilities. This lack of development can be explained by the nature of these tasks – in tasks with sequential task interdependence, routines were common and employees were largely working with codified data. Although the tasks were advanced, they did not require judgment calls or subjective decision making by the

employees, as they were associated with relatively low risk for the client. The tasks involved the combination of existing knowledge bases in a novel manner; however the inputs and outputs were clearly defined, therefore, there was a low level of uncertainty associated with the completion of the tasks. This is consistent with Kumar et al.'s (2009) characterization of 'non-sticky interdependence': sequential tasks are often unambiguous and require a finite amount of knowledge and expertise. Consistent, with the demands of these activities, the clients did not view ongoing interaction between onshore and offshore personnel essential to the production of these services because of the low level of risk involved. Through the use of effective interfaces such as standard operating procedures, plans and schedules the client could coordinate the performance of these activities (Tushman and Nadler, 1978). Though the employees were performing advanced services, due to their sequential nature, it was possible to rely on modular interfaces, which reduced the level of interaction and learning opportunities. This is consistent with the recent findings that the disaggregation of the value chain increasingly allows for advanced services to be modularized (Contractor et al., 2010). Therefore, individual employees had no opportunities to develop their own capabilities through interactions with or learning from the client. The employees arguably possessed the skills required to perform sequential tasks, such as data-analysis skills, even before they were hired. Thus, the only knowledge transfer and learning that took place was limited to explicit knowledge about the client and the relevant industry context, which reduced the opportunities and need for the development of human capital capabilities. The development of human capital capabilities are closely related to the transfers tacit knowledge (Lahiri and Kedia, 2009; Szulanski, 1996), however, in this case, individuals primarily received explicated knowledge from the client and did not have the opportunity to incorporate their existing knowledge bases with additional knowledge from the

client and apply it in a novel fashion, thereby limiting the opportunities for human capital capability development.

These findings are in contrast to those for the cases with reciprocal task interdependence in which the service providers were responsible for the performance of core activities. To ensure a high standard of performance and mitigate the high level of risk for the client (Kumar et al., 2009), weekly feedback meetings were held with the client. Tasks characterized by reciprocal interdependence lead to greater dependence on the client due greater demands on problem solving and integration (Dyer and Singh, 1998; Galbraith, 1973). These meetings included discussions of a practical nature and reviews of the output delivered by the service provider. This frequent and intense interaction allowed the service provider employees to develop and extend their knowledge base, and created an opportunity to integrate past experiences with current tasks and extend the value offering to the client. The frequent interaction and feedback loop led to the employees absorbing knowledge from the client and recombining it with past knowledge in order to create new offerings for the client, which in turn resulted in the development of new in-house capabilities for the service provider (Henderson and Clark, 1990; Pisano, 1997). This supports the findings presented by Ethiraj et al. (2005) and Vivek et al. (2009) on the importance of relationships, and their impact on the development of capabilities. Thus, we propose:

Proposition 1: Offshore service providers can develop human capital capabilities when they produce client services characterized by reciprocal task interdependence.

In contrast to human capital capabilities, we found that organizational capital capabilities were only developed through the execution of routinized, documented processes relying on codified and explicit activities, such as sequential task activities (cases A and B). If the client was able to clearly communicate and document the production process through, for example, standard operating procedures and to transfer the required knowledge, then service providers were able to develop organizational capital capabilities. The documents could be shared and efficiently disseminated within the firm. Efficient utilization of the documents received from the client not only added to the repository of the service provider, but efficient usage and utilization could increase the potential absorptive capacity capabilities of the service provider firm as well (Zahra and George, 2002). As the processes were relatively standardized, they could also be applied and transferred to other contexts, and they could be utilized in the execution of tasks for other clients. Therefore, the client interaction in the form of documents and transfer of processes could increase the service offerings by the service provider, and also subsequently attract more clients (Jensen, 2009). As the service provider performed tasks for a number of different clients, knowledge gained from various clients could be accumulated, codified, and utilized throughout the organization through the use of structures, systems, and processes (as also observed by Subramaniam and Youndt, 2005). This ensured the further development of organizational capital capabilities. Therefore, we propose:

> **Proposition 2:** Offshore service providers can develop of organizational capital capabilities when they produce client services characterized by sequential task interdependence.

We found evidence of management capabilities being developed in cases with sequential task interdependence and in cases with reciprocal task interdependence, but the development occurred via different mechanisms.

In service production with sequential task interdependence (cases A and B), the initial knowledge transfer, the selection of human resources, the understanding of project requirements, and the allocation of resources were crucial management tasks. Managerial judgment was necessary for identifying and hiring the most appropriate human resources. The allocation and reallocation of resources was frequent due to the attrition rates associated with performing routine tasks (Budhwar, Luthar and Bhatnagar, 2006); however, these processes were of little significance to the client due to the low risk and uncertainty associated with these tasks. This finding could possibly be idiosyncratic to the Indian context; the Indian BPO and KPO industries are facing high attrition rates and encountering a shortage of trained employees (Budhwar et al., 2006). Despite the limited need to use personal judgment and skills while executing these activities managers had to ensure that an adequate number of qualified employees were assigned to the various tasks. Given the higher attrition rates in the production of services with sequential task interdependence, managers frequently had to engage in the allocation of resources. Therefore, these tasks led to the development of managerial capabilities related to the identification and allocation of resources.

Similarly, in reciprocal service-production processes (cases C, D, and E), the assembly and allocation of resources was equally (or even more) important but less frequent due to lower attrition rates. The employees needed to have certain levels of expertise, and the ability to use their knowledge and abilities in the production of the services. Finding employees with the required skill levels was more challenging (Budhwar et al., 2006) than in sequential services, but

the frequency of assembling and allocating those resources was lower. Therefore, management capabilities specific to the recruitment of human resources were developed in cases of reciprocal task interdependence, albeit in a different manner compared to the cases of sequential task interdependence.

Interaction between the clients and the service provider managers also differed between the cases involving sequential and reciprocal task interdependence. For example, in sequential-task cases, interactions related to the codification and transfer of knowledge for the further training and education of the staff. Due to the high attrition rates, the documentation needed to be of high quality and the processes needed to be effective. Therefore, managers became adept at training employees and acquired a high degree of autonomy in training their employees in-house.

In the cases of reciprocal task interdependence, the relationships between the clients and the service provider managers were characterized by a high degree of interaction and active participation in the development of employee skills (Luo et al., 2012). Clients were asked to approve employees working on their cases in order to ensure that they had the required skills and understanding of the industry and market context, this reduced the complexity and uncertainty involved in hiring training employees and allowed the clients the opportunity to be involved in the hiring process (Luo et al., 2012). Due to the high degree of industry- and market-specific knowledge, and the high levels of task uncertainty needed to perform the reciprocal tasks, clients played a much larger role in monitoring performance, inputs, and outputs (Tushman and Nadler, 1978). In the initial stages, the clients meticulously monitored performance, and this intense interaction helped develop and nuance the knowledge base of the managers and their employees. The close interaction between the clients and service provider

firms ensured quality control for the client, and allowed for more tailored results and responsiveness in meeting the client's needs (Willcocks and Lacity, 2006). Consequently, the very nature of these interactions allowed managers to provide value-added outputs and to propose new ideas to existing clients. In addition, managers could use the newly gained knowledge and experience to attract new clients through evidence of past success and to suggest novel value propositions for those clients. This leads to our third proposition:

> **Proposition 3:** Offshore service providers can develop management capabilities when they produce client services in both types of service production (i.e., services characterized by either sequential task interdependence or reciprocal task interdependence).

Our findings show that interactions with clients in the service-production process do not uniformly contribute to the development of human capital capabilities, organizational capital capabilities, and management capabilities. Moreover, neither sequential nor reciprocal tasks contribute to the development of all three capabilities, which implies some potential managerial challenges. We summarize the different contributions to capability development in Table 2-3.

Table 2-3 Capability development of sequential and reciprocal services

	Sequential services	Reciprocal services	Propositions
Human capital capabilities	Not developed	Developed	P1
Organizational capital capabilities	Developed	Not developed	P2
Management capabilities	Developed	Developed	P3

Implications for future research

This study contributes to our understanding of the contribution of client interaction on the capability development of service providers. In addition to the capabilities discussed above, the extant research has noted that emerging-market firms do not always possess capabilities from the outset, although they do possess factor-cost advantages. Thus, linkages with and spillovers from developed-market firms (including client firms) are crucial for the development of capabilities in emerging-market firms (Matthews, 2002; 2006). Recent work finds that even though firms from emerging markets engage in innovative activities, they have not necessarily caught up with developed-market firms (Awate et al., 2014; Brandl and Mudambi, 2014).

More specifically, the study makes three contributions to the research on offshore outsourcing of services. First, while previous research predominantly studies offshoring from a client-firm perspective, we adopt the perspective of the service provider firm. We therefore address the research gap described in the introduction of the paper. Second, we identify the roles played by different types of service activities in the development of capabilities in service provider firms. By taking an activity-based perspective in our analysis of responses to questions pertaining to firm strategy (Johnson et al., 2003), we are able to uncover dimensions of offshore outsourcing and capability building at a more fine-grained level of analysis. In this regard, the study more broadly contributes to our understanding of the impact of offshore outsourcing on the competitiveness of service provider firms. As a significant part of the services-outsourcing industry consists of firms from emerging markets, which is also the case in our study, the paper also relates to the evolving research stream on the nature and growth of emerging-market firms (e.g., Cuervo-Cazurra, 2012; Narula, 2012). Third, the study contributes to the theoretical discussion in the research strand on firm resources and capabilities, as it is connected to questions raised by strategy scholars concerning how heterogeneous firm resources and

capabilities may be built (Dierickx and Cool, 1989; Kraajenbrink, Spender, and Groen, 2010; Maritan and Peteraf, 2011), and whether such resources and capabilities may stem from firm-internal or firm-external sources (Barney, Ketchen, and Wright, 2011; Dyer and Singh, 1998; Johanson and Vahlne, 2009; Kedia and Mukherjee, 2009; Maritan and Peteraf, 2011).

In this regard, our findings also suggest that there may be linkages between the literature on firm resources and capabilities and the literature on global value chains. The latter stream of literature has addressed questions relating to the role of firms from emerging markets and developing countries in global value chains, the barriers to and possibilities for entering the global value chains, and the potential for upgrading and business development (e.g. Gereffi, Humphrey, and Sturgeon 2005). The global value chain literature proposes that the learning required to develop and enhance capabilities can be time consuming, path dependent, and challenging. Thus, learning from external sources, such as a client, may expedite this process and assist in upgrading capabilities (Gereffi et al., 2005). By investing in close ties with developed-market clients, emerging-market firms enter into relationships that may help with the development of capabilities and enable them to achieve mature-market standards through spillovers (Mudambi, 2008).

A discussion of capability development lends itself to a more nuanced view of the upgrading mechanisms discussed in the global value chain literature. We found that the combination of the existing knowledge base with new knowledge acquired from clients led to functional upgrading (Humphrey and Schmitz, 2000; 2002), whereby the service providers expanded their range of offerings and provided more sophisticated solutions to existing problems. Moreover, the combination of client demands with service providers' initiative enhanced in-house human and management capabilities, which also led to functional upgrades.

Furthermore, the development of organizational capital capabilities through the performance of sequential tasks contributed to process upgrades for the service provider. The enhancement of organizational capital capabilities led to an increase in the overall knowledge stock within the service provider firm, which allowed it to replicate such processes in other client accounts. We see this point as a contribution to the global value chain literature, as we demonstrate the specific mechanisms and processes through which capabilities are developed, which in turn leads to process or functional upgrading within a firm. In other words, our study sheds light on the mechanisms through which the service providers' capabilities are enhanced through linkages and interactions with the client.

While the global value chain literature has been preoccupied with barriers to entry, the subordinate role of firms from emerging markets and developing countries in the global value chains, and the difficulties such firms face in upgrading their services and products (e.g., Buckley, 2009; Palpaucer, Gibbon, and Thomsen, 2005; Thomsen, 2015), our findings highlight positive influences on capability development in service provider firms. However, our findings also support such points from the global value chain literature, at least to some extent, as they show that linking with, learning from, and leveraging knowledge from client firms are not panaceas for the business-development challenges faced by service provider firms. The impact of interactions with clients in the offshore outsourcing of advanced services is positive, but it seems to offer only the *potential* for sustaining and building competitive advantage. Significant efforts on the part of service provider firms are required to explore and exploit that potential. We elaborate on this point in our discussion of the strategic implications for service provider firms. In sum, our findings suggest that there are clear parallels between research on capability

development in the literature on firm resources and capabilities, and the upgrading phenomenon as discussed in the global value chain literature.

Implications for firm strategy

While the enhancement of human capital through reciprocal activities is attractive for individual employees, human capital capabilities are not necessarily translated into and/or embedded at the organizational level in either a business unit or the firm as a whole. The high attrition rates often observed among service providers in India suggest that service providers struggle to ensure that the knowledge capabilities built at the individual level are transferred and scaled-up at a more aggregated organizational level. If the service provider firm does not succeed in this regard, then the individual's contributions to human capital and competitive resources are likely to be very limited. The knowledge remains with the individual employee and, therefore, disappears when that individual leaves the firm.

This is analogous to sequential service production, where we see a contribution to organizational capital capabilities but no development of new content knowledge or other forms of human capital capabilities. Organizational routines are built, but they simply entail the execution of business processes as defined by the client without any accompanying development of human capital capabilities. The value added for the service provider in terms of developing resources that may be used for further business development or advancing the service offering is consequently limited. While the development of organizational capital capabilities benefits the service provider by increasing its explicit knowledge stock, this can be a short-term strategy for the service provider. Industry trends show that the relocation of advanced services such as R&D activities to India is increasingly common (Lewin et al., 2009), but these activities are largely reliant upon tacit knowledge and the co-creation of new knowledge. Therefore, enhancing

organizational capital capabilities of the sort observed in this study may not lead to a long-term competitively favorable position within the Indian or global outsourcing industry.

Continued engagement with clients can lead to additional functional and product upgrades, as the service providers can provide a broader range of more sophisticated solutions. However, there is one potential pitfall—employees working with specific clients might accumulate idiosyncratic knowledge and develop human capital capabilities that are closely tied to particular clients. While the production of more sophisticated services may be beneficial for clients, it may not translate into increased competitiveness for the service provider as a whole. The relationship may become stronger and employees may gain more experience, which may be important for maintaining the relationship and the contract with the client. Beyond these aspects, however, the positive implications for the firm might not be significant.

From a managerial perspective, we show that the development of capabilities at, for example, the human-resource level does not automatically translate into organizational capital capabilities. We identify some limitations of capability development. In particular, managers need to ensure that developed capabilities are retained in house, and not lost through attrition or an inability to convert tacit knowledge into organizational standards. In view of the growing competition in emerging markets, these implications are important for service providers and, if effectively managed, they can significantly affect their performance and competitiveness. In addition to employee attrition, service providers could mitigate these risks by taking a strategic approach to the selection of partners, and ensure that they carry out both sequential and reciprocal activities. This may ensure that the service provider benefits from the development of various capabilities through partnerships with these clients. Our study suggests that services providers are best served by adopting a selective, targeted approach in their client-selection

strategies, as we find a direct link between the types of service production undertaken by the service provider and the development of the firm's own capabilities.

2.5 CONCLUSION

In this multiple case study, we analyzed how offshore outsourcing of advanced service activities contributes to the development of capabilities in service provider firm. We also examined how different types of task interdependence in the service-production process influence this development. We find support for our overall hypothesis that the development of various capabilities is influenced by the characteristics of the service-production process. More specifically, we show that when advanced services characterized by sequential task interdependence are offshore outsourced, the service provider firms develop organizational capital capabilities and management capabilities. At the same time, human capital capabilities remain unchanged. In contrast, when advanced services characterized by reciprocal task interdependence are offshore outsourced, the development of human capital capabilities and management capabilities is supported. However, this type of service production does not support the development of organizational capital capabilities. It follows that neither type of service production contributes simultaneously to the building of all three types of capabilities, which together constitute the dependent variable in the study.

We discussed the strategic implications for service provider firms resulting from the influence of the two types of service production. Moreover, we presented three propositions for further investigation in larger-scale studies, and we have positioned our findings in relation to the literature on firm resources and capabilities, and the literature on global value chains.

Chapter 3: Old Dog, New Tricks: How does the capability-development process unfold in an offshoring context?[8][9]

Manya Jaura[10]

Abstract: Through an in-depth case study, I examine how the process of capability development unfolds as a consequence of relocating R&D activities to a captive offshore unit performing standardized activities. I analyse this relocation process and identify the salient phases of capability development. I find that organisational restructuring, ongoing mentoring and collaboration with the external network support the development of the offshore unit's capabilities, while managerial resistance and a lack of problem-solving capabilities in the offshore unit hinder this development process. The relocation of R&D increases the interdependence between the two units and challenges the status quo. I identify that the offshore unit develops learning and integrative capabilities, while the home unit develops structural and interface management capabilities. I present propositions for further investigation, and position the contributions in relation to the extant literature on capability development, offshoring and subsidiary mandates.

Keywords: offshoring; capability development; R&D; process model

[8] An earlier version of this paper was presented at AIB Doctoral Consortium 2014; and nominated for Best Conference Paper Prize for Practice Implications at SMS 2014.
[9] Under review at International Business Review
[10] Copenhagen Business School, Frederiksberg, Denmark

3.1 INTRODUCTION

In this paper, I explore the mechanisms through which capability development takes place in an offshore unit. I examine how this development is constrained by the initial role of the unit, and how it is influenced by the subsequent collaboration between the onsite and offshore units. My goal is twofold: (1) to provide a process perspective of capability development, and (2) to identify the mechanisms and trajectories through which capability development takes place.

Firms are increasingly offshoring research and development (R&D) to emerging economies, such as India, in order to take advantage of lower production costs, and the talent and knowledge available in those countries (Lewin et al., 2009). Home-country factors, such as the increasing difficulty of finding skilled talent, along with the rise of knowledge clusters in emerging economies entice firms to relocate their activities (Manning et al., 2008). However, this argument assumes the presence of the talent and capabilities needed required to undertake R&D in the host country, while it overlooks scenarios in which low-cost units evolve into R&D centres for a multitude of reasons, such as changes in strategic direction, limitations to in-house resources and falling employee motivation in the offshore unit resulting from the performance of monotonous activities. For example, Vestas Wind Systems, a Danish MNC, established an R&D back-office performing support tasks in India in 2007. Due to the competences and talents identified in this centre, higher levels of R&D responsibility were transferred to Chennai in 2008 (Pedersen and Larsen, 2010). As such, an offshore unit is able to develop its capabilities and upgrade its role within the organization. However, extant research applies a largely static and 'either-or' approach when examining the role of offshore units (e.g., Chen and McQueen, 2010; Doh et al., 2009; D'Agostino, Laursen and Santangelo, 2013; Jensen and Pedersen, 2011; Jensen and Petersen, 2012), and pays little attention to the evolution of skills in those units.

Similarly, the headquarter-subsidiary literature pays a significant amount of attention to the evolution in subsidiary mandates, as well as the gain or loss of those mandates. This stream of literature claims that in order for mandates to be gained, the subsidiary must possess the requisite capabilities (Birkinshaw and Hood, 1998). We know that capability development is dependent on absorptive capacity and constrained by the firm's existing capability base (Cohen and Levinthal, 1990; Zahra and George, 2002). Therefore, offshore units established with the sole purpose of handling back-office functions, or performing routine or

standardized tasks receive knowledge and training focused on those particular functions. In addition, offshore units perform tasks that have been disintegrated from the home unit and relocated offshore, which limits the offshore unit's architectural knowledge, role and expertise for performing the focal tasks. Therefore, the evolution of an offshore unit is likely to differ from the evolution of a conventional subsidiary. The preconditions for upgrading the offshore unit's role, such as developing a local network, acquiring local market knowledge or strengthening the local position (Birkinshaw and Hood, 1998), might not be relevant for an offshore unit solely responsible for back-office functions. For the same reasons, captive offshore units differ from subsidiaries in the way that capability development is instigated. In the case of the subsidiary this might be instigated by the headquarters, or often by the subsidiary itself (Birkinshaw and Hood, 1998). However, in the case of a captive offshore unit it is most likely that the headquarters invoke the capability development.

Captive R&D offshoring is expected to become one of the fastest-growing offshoring segments in the BRIC countries (Brazil, Russia, India and China), especially in India (Lewin and Peeters, 2006). Despite these forecasts, the operational and managerial issues encountered while engaging in R&D offshoring are largely understudied (Angeli and Grimaldi, 2010; Cheng and Bolon, 1993; Grimaldi, Mattarelli, Prencipe and Von Zedtwitz, 2010; Lewin et al., 2009; Maskell et al., 2007; Parida et al., 2013). Successfully making the transition from low-end activities to R&D activities requires a significant upgrade in the capabilities of the offshore and home units. The headquarters unit needs certain capabilities to effectively relocate activities, coordinate processes, integrate efforts and devise methods to transfer knowledge to the offshore unit (Jensen et al., 2013), while the offshore unit requires capabilities that enable it to receive knowledge from the headquarters, apply it effectively and deliver outcomes. To ensure the successful relocation and performance of R&D activities, extensive knowledge transfer and capability development must take place (Ethiraj et al., 2005; Rilla and Squicciarini, 2011; Singh, 2008; Zollo and Winter, 2002). However, the uncertainty and complexity associated with R&D, and the geographical distance between the two units mean that planning and executing the capability-development and transition processes are complicated and problematic tasks (Rilla and Squicciarini, 2011; Singh, 2008; Weigelt and Sarkar, 2012).

I posit that offshore units are not always limited by an 'either-or' distinction. Instead, they have the ability to move along the continuum from performing standardized

activities to R&D. This study was inspired by the managerial challenges associated with the complex process of upgrading the skills of a pre-existing, low-cost unit. By applying a dynamic perspective, I examine the process through which an offshore unit makes the transition towards R&D. In bridging the gap between the subsidiary-evolution literature and the offshoring literature, I draw a preliminary conclusion that in order to evolve and upgrade, an offshore unit must develop in-house capabilities. The focus of this study is to examine the path of capability development. The main research question is: *What are the key mechanisms that shape capability-development in an offshore unit?*

I use an in-depth case study to demonstrate how the role and past experience of a captive offshore unit affects the subsequent capability development in the unit. This study aims to develop our understanding of R&D offshoring, and to discuss the often-neglected issues of capability development and the requisite coordination between units. I follow an offshore subsidiary as it develops its innovation capabilities, and examine why the innovation catch-up takes longer than management expects. By following the dynamic process and explicating the development of offshore units, this paper makes theoretical and practical contributions. Furthermore, the process perspective allows for insights at several levels within the organization (Langley, 1999; Montealegre, 2002). Therefore, this discussion moves beyond the technical skills required to perform R&D to include a discussion of the organizational systems supporting or disrupting the catch-up process. From the practitioner's point of view, this paper deals with real-world managerial challenges, as managers in these situations need to deal with knowledge loss and the pressures of relocation while maintaining innovative performance to ensure high returns. In this study, the upgrade processes are followed as they unfold, as are their effects on day-to-day operations. These processes require that managerial and organizational resources be refocused and devoted solely to the upgrading process. Therefore, identifying inhibiting and encouraging factors not only expedites the process but also provides managers with an inclusive view of the upgrading process. I make three main contributions to the offshoring literature. First, I map out the process through which the R&D relocation process takes place as well as the corresponding capability-development process. Second, I identify the specific capabilities that the home and offshore units develop during this process. Third, I address a relevant managerial problem, and provide insights into the upgrading and capability development of a captive offshore unit. I also contribute to the limited literature on capability development: first, I address

recent calls to engage in more longitudinal studies examining the process of capability development (Montealegre 2002; Parida et al., 2013). Through this inquiry, I have added to our limited understanding of how the capability development process unfolds. Second, I define capabilities and distinguish them from knowledge and resources, in an attempt to establish capabilities as an independent construct rather using it interchangeably with other constructs. And finally, I identify the specific capabilities that the offshore and home units develop as a consequence of the R&D relocation. The offshore unit develops learning (Cohen and Levinthal, 1990) and integrative capabilities (Henderson and Clark, 1990; Kogut and Zander, 1992; Pisano, 1997), while the home unit develops structural and interface management capabilities. By identifying the specific capabilities that are developed in response to R&D relocation, I expand our understanding of R&D capabilities and what they constitute.

In the next section, I discuss the literature in the field of offshoring and capability development. The third section delves into the research methods applied. The analysis, which draws on the data, leads to the development of a process framework of capability development, which reveals patterns of relocation, interaction, learning and adjustment processes. The discussion section links extant theory with the analytical findings, applies a critical perspective to the process of capability development and develops three propositions that summarize the discussion. In the final section, I draw implications, discuss the limitations of this study and identify avenues for future research.

3.2 THEORETICAL DEVELOPMENT

Capability Development

In order to understand what capability development is I first look at how 'capabilities' are conceived in the literature. I conclude this section by presenting a definition of capabilities and capability development. Winter (2003: 991) defines an organizational capability as "a high level routine or collection of routines that together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type". Nelson and Winter (1982), who were some of the earliest proponents of the capability-based viewpoint, argued that capabilities are intangible bundles of skills and accumulated knowledge. They viewed the firm as encompassing valuable, inimitable processes

that enable the deployment of resources (Amit and Schoemaker, 1993; Helfat, 1997; Weigelt, 2009).

Cohen and Levinthal's (1990) discussion of learning capabilities and absorptive capacity capability relates to the acquisition, assimilation and exploitation of knowledge. This view suggests that a company's ability to absorb external knowledge largely depends on its extant knowledge (Cohen and Levinthal, 1990). At the organizational level, capabilities relate to collective action (Levinthal, 2000), and include such practices as skill development, mentoring, reward systems and incentives (Easterby-Smith and Prieto, 2008). The capabilities of a firm rests upon such processes as organizational and managerial integration, learning, reconfiguration and transformation, and paths to achieving strategic outcomes (Amin and Cohendet, 2004).

Notably, the difference between capabilities and knowledge is often unclear in the literature, and the two are often viewed as similar. Capabilities involve both tacit and explicit knowledge, but they are beyond the mere accumulation and exploitation of knowledge (Amin and Cohendet, 2004). Similarly, Barney (1991) uses resources and capabilities interchangeably. However, other scholars have distinguished between capabilities and resources, for example Makadok (2001) refers to capabilities as a firm's ability to deploy resources in combination with organizational processes (Makadok, 2001), while Zollo and Winter (2002) view learning, experiences, resources and routines as inputs into capabilities and their development. Consistent with the above authors, I adopt the view that capabilities are embedded in the organization and its processes, and they enhance productivity of the other resources that the firm possesses (Makadok, 2001). Inspired by existing definitions, I define capabilities as a *high level collection of routines that in combination with firm assets and routines lead to the effective deployment of resources and meeting commercial ends.*

Capability development is limited by the firm's existing base of capabilities, and it is influenced by the firm's resources and its past experiences in developing capabilities (Grant, 1996). Capability development involves a process of learning through trial and error, or through a search of alternative routines (Cyert and March, 1963; Laamanen and Wallin, 2009), and requires the collection and coordination of knowledge, mechanisms to govern interactions and actions, and learning by doing (Amin and Cohendet, 2004; Ethiraj et al., 2005). Capabilities are developed not only through routines, but also through deliberate investments in organizational structures and systems (Zollo and Winter, 2002). Capability development can be viewed as path

dependent because past actions and previous knowledge residing within the firm affect the firm's future actions and its investments in capability development (Parida et al., 2013; Sirén, Kohtamäki and Kuckertz, 2012; Sydow, Schreyögg, and Koch, 2012; Zahra and George, 2002).

Recent research has begun examining capability development as a process (for example, Montealegre, 2002; Parida et al., 2013). Interestingly, Montealegre (2002) was unable to identify a single process model of capability development, which reflects the underdevelopment of this phenomenon. This study identified the capability development took place through three the developmental phases, and each phase utilized external, organizational and technological resources. Similarly, Parida et al.'s research (2013) identified a setup, start-up and ongoing phase of developing R&D capabilities. In response to the limited research on capability development and to be rigorous about the focus of this study, I define capability development *as a deliberate firm-level investment involving a search and learning process to modify or enhance existing capabilities.* Combined with the previous findings (Montealegre, 2002; Parida et al., 2013), I argue that while learning is an important component of the process, capability development extends beyond learning. Capability development can for example, require the modification of internal routines, knowledge restructuring, development of new knowledge (Parida et al., 2013), trial and error experimentation, integrating resources among activities (Montealegre, 2002), among others. Therefore, capability development encapsulates organizational learning, but is not limited to it.

R&D Offshoring

Offshoring – an element of organizational configuration that represents a departure from traditional internationalization theory (Lewin and Volberda, 2011) – is defined as the relocation of organizational tasks to foreign locations (Lewin et al., 2009; Jensen et al., 2013). The challenges related to offshoring including dilemmas of global configuration, building a network and creating synergies within the firm (Contractor et al., 2010). Furthermore, the interdependence between the home and offshore unit requires significant effort aimed at simplifying communication and increasing the predictability of actions (Srikanth and Puranam, 2011). The introduction and monitoring of organizational practices, such as skill development and mentoring, become more complicated. The geographical distance between the offshore and home units increases the challenge of identifying the capabilities required to perform the

offshored tasks and the resources required to develop those capabilities. It also makes organizational capabilities for coordinating and monitoring the relocation process necessary.

R&D offshoring differs from other firm functions due to its non-specifiable and discretionary nature. R&D activities are characterized by a high degree of risk and uncertainty. While the outcomes may be of strategic importance to the firm, they are not always well defined (Doctor, Newton, and Pearson, 2001; Kuemmerle, 1998). Therefore, a high degree of knowledge transfer is necessary to communicate requirements, as both units are engaged in the search and co-production of new knowledge (Nelson, 1982). As a firm's R&D network spreads geographically, costs arise in relation to maintaining synergies among the units, stipulating expectations and outcomes ex ante, and relying on coordination mechanisms (Howells, Gagliardi, and Malik, 2008).

Research on R&D offshoring can be subdivided into research on offshore outsourcing and research on captive offshoring. The R&D offshore outsourcing stream has primarily focused on location choice, goal conflicts and performance (Demirbag and Glaister, 2010; Martinez-Noya, Garcia-Canal, and Guillen, 2012, 2013). It argues that dispersed R&D is negatively related to innovation performance because of the increased coordination needs and the complexities affecting knowledge transfer (Singh, 2008). Grimpe and Kaiser (2010) find an inverse u-shaped relationship between R&D outsourcing and innovation performance. Their findings are supported by Weigelt (2009), who argues that as capabilities are path dependent and built over time, outsourcing can lead to the hollowing out of competences and the depreciation of integrative capabilities. Recent work suggests that the outsourcing of R&D activities diminishes the firm's integrative abilities, which determine a firm's capacity to use and assimilate new technologies. In addition, outsourcing decreases investments in knowledge-related activities and, therefore, reduces the focal firm's learning-by-doing, leading to an overall decrease in capabilities and their development (Grimpe & Kaiser, 2010; Weigelt, 2009). Research on captive offshoring R&D finds that local R&D units can become myopic and only develop capabilities that serve the local market, such that they do not focus on the wider picture (Singh, 2008). Furthermore, while offshored R&D units are expected to develop capabilities, the firm faces greater integration and coordination costs in order to leverage those capabilities (Singh, 2008).

The capabilities developed within an offshore R&D unit are closely related to the motivation for establishing that unit. Research on R&D internationalization explores the factors explaining such units. Researchers have described the importance of foreign direct investment (FDI) in R&D for exploiting firm-specific capabilities in foreign environments (Bartlett and Ghoshal, 1990; Håkanson, 1990; Vernon, 1966). Dunning and Narula (1995) claim that most FDI in R&D is strategic asset seeking FDI that occurs through the acquisition of existing innovative assets rather than through greenfield establishments. Kuemmerle (1999a) develops a typology of R&D internationalization based on two motivations: home-base augmenting (HBA) and home-base exploiting (HBE). Both of these types of R&D internationalization are subject to different forces (Kuemmerle, 1999b), and they can either be demand driven or supply driven (Narula, 2002). Demand-driven R&D can often be a substitute for activities being carried out in the home location, as these activities can be undertaken more efficiently at a different location. On the other hand, supply-driven activities are related to firms wishing to improve their existing assets (Narula, 2002).

In addition to demand and supply factors, the abilities of the offshored unit also play a significant role in carrying out that unit's mandate. In the case of demand-driven factors, it is possible that the offshore unit does not possess the requisite capabilities to perform R&D, however, needs to make the transition to being an R&D unit to fulfil strategic objectives. In this case the offshore unit would need to evolve or transition into an offshore R&D unit, despite not originally possessing the capabilities required to perform R&D. Consequently, the unit would need to engage in some sort of capability development to satisfy the demand to perform R&D. However, we have a limited understanding how a unit responds to such demand-driven factors. We would therefore, benefit from understanding how an offshore unit responds to the demands to transition from performing 'exploitative' activities to 'explorative' activities.

Process Perspective in Offshoring

Recently, research has begun to examine the process of offshoring through a dynamic lens and argued that the process of offshoring can be explained as a learning-by-doing process. Lewin and Peeters (2006) examine the different phases of offshoring administrative and technical work to low-cost countries. The authors find that initial success in certain functions, such as IT or finance, leads to experimenting with the offshoring of more technical and high-end functions, such as engineering, product design, and R&D. The authors argue that while the

sequence of offshoring functions is industry specific, the learning-by-doing process through which companies progressively relocate increasingly complex tasks was common. In a similar vein, Jensen (2009; 2012) finds that as offshore outsourcing partnerships mature and firms gain experience, the relationship evolves over time, such that it eventually differs from the initial objectives and expectations. The outsourcing partner uses the client to connect with other potential clients, while the client uses the partner to upgrade its own organizational processes (Jensen, 2009). Vivek et al. (2009) also find that the relational preferences and roles change over time, and that some partnerships adapt the existing strategy based on trust, experience and joint learning (Vivek, Richey and Dalela, 2009). Maskell et al. (2007) posit that offshore outsourcing is a sequential learning process in which cost advantages precede the pursuit of differentiation advantages. While the focus on diminishing operational costs remains significant, motives related to the acquisition of knowledge increase in importance over time (Maskell et al., 2007). Furthermore, Parida et al. (2013) study the complex relationship between improvisational learning and capability development during R&D internationalization. They introduce a stage model, which includes three stages of capability development: (1) the setup stage, (2) the start-up stage and (3) the ongoing stage.

This stream of research posits that offshoring can be seen as a learning process through which firms discover new possibilities abroad. While the application of the process perspective is limited, it yields a common finding – the initial purpose for offshoring and the role of the offshore unit evolve as the parent firm engages in a period of learning. However, this stream of research does not examine the learning process in the offshore unit. Extant research shows that there is a period of learning (Jensen, 2009; Lewin and Peeters, 2006) and that offshoring takes place in phases (Maskell et al., 2007). Consequently, there must be a corresponding period of learning and upgrading of capabilities that enables the offshore unit to make the transition from low-tech tasks to high-tech work. This paper aims to fill this gap in the extant literature by identifying the specificities of this upgrade process, the supportive mechanisms and potentially inhibiting factors.

3.3 METHODS

Research Context

This paper utilizes a case study of The Tecnik Group (hereafter Tecnik), a Danish MNC that supplies equipment and services for the extraction of minerals and for cement production. The company is headquartered in Denmark, and it is present in more than 50 countries, including project and technology centres in Denmark, India, the US and Germany. I focus on a unit within Tecnik called Biztek. The unit's primary offering is industrial-sized filters designed to filter air before releasing it into the environment. Biztek consists of entities in the US, India, Spain, China, Brazil, Russia and South Africa, and has a total of 400 employees, including 150 employees in both India and Denmark. Biztek operates with independent sales functions in each location, along with a number of shared global services, such as engineering, sourcing and product development.

At the time of the case study in November 2012, the Biztek unit was in the early stages of relocating developmental activities with the goal of gradually moving R&D activities from the headquarters in Denmark to the captive offshore unit in India. The case therefore appeared to be a typical case (Seawright and Gerring, 2008), as it followed the pattern of relocation outlined in the offshoring literature (i.e., after a period of low-end relocation, companies engage in the offshoring of more complex activities; Lewin and Peeters, 2006; Maskell et al., 2007). Furthermore, the relocation pattern in this case was representative of organizational learning patterns as discussed in the offshoring literature (Jensen et al., 2013; Maskell et al., 2007). Case selection was motivated by the stage of relocation in which Biztek found itself and by the underrepresentation of this process in the extant literature. My goals were to examine this process closely, and to identify the challenges that management identified in terms of relocating development activities to India. The puzzling phenomena that I sought to address were the inability of the Danish management and the reluctance of the Indian unit to relocate and conduct these development activities, respectively. Therefore, even though, in principle, this case followed the trajectory outlined in the research (i.e., increasing sophistication over time), management did not view the process as straightforward. Therefore, my aims were to probe the mechanisms of relocating R&D, to understand the capability-development process and to examine the unfolding of the upgrading process (Seawright and Gerring, 2008).

The unit in Chennai, India, was established in 2002 to handle offshored low-cost engineering activities. The unit began with approximately four to five employees and grew gradually. From 2006 until 2012, the process of setting up the Indian unit as a full-fledged business unit was carried out through the addition of such functions as sales, project management, purchasing and logistics. These additional functions were performed on a domestic level, while the engineering services were performed on a global level. The overall goal of Biztek's management was to create a global perspective within the organization with equal access to resources regardless of where a product was sold or developed. In accordance with the global-perspective strategy, the relocation of R&D activities to Chennai began in early 2012. The motivations were to utilize the region's greater resources, to bring the product to the market faster and to increase the abilities of the Indian employees in the long-term. However, Biztek had no comprehensive strategy for performing R&D activities in India, and responsibility for growing this initiative rested with the managers for the different product lines. In order to promote this strategy, the organizational structure within Biztek was modified starting in 2012. Prior to that time, the unit had been horizontally divided based on the functions performed, but the restructuring in 2012 led to the separate management of each product line. The different product lines were electrostatic precipitators (ESP), fabric filters group, system design and an overall support group. These units were mirrored in Denmark and India, with the same product manager made responsible for both units.

Research Approach and Methods

In order to gain a multidimensional understanding of the research topic, I utilized a case-based research method (Eisenhardt, 1989; Meredith, 1998). This study focuses on the dynamic process of capability development, which is not yet thoroughly understood. As such, a case study was the logical method (Yin, 2009). In iteratively utilizing theory and data, I applied a process research perspective in order to better understand the dynamic phenomenon of capability development. Process data allow us to understand how and why certain events play out over time (Langley, 1999; Mintzberg, 1979). In order to understand the evolution of R&D offshoring, the process through which it unfolds and the mechanisms through which it takes place, I needed to obtain data from employees at different levels, with different perspectives and at different locations. The fieldwork lasted from November 2012 until October 2013. I collected data from Biztek's home unit (Denmark) and offshore unit (India). Semi-structured interviews

and meeting observations helped create a rich understanding of the context, the capability-upgrading process, and differences in perception in the home and offshore units. Moreover, I took detailed field notes during visits to the various units. The interviews pertained to previous and ongoing events in the upgrading of R&D activities. The interviews began approximately 6-8 months after the initial upgrading projects had been relocated and continued for the first 18 months after the relocation. This increased the likelihood that I could accurately determine the sequence and nature of events. In addition, during most site visits, I met with visiting employees to discuss ongoing projects, which allowed me to observe project planning in real time. Participation in these meetings resulted in follow-up discussions with relevant employees.

I began by interviewing key participants in the relocation process. I asked each of those interviewees for the names of others whom I should interview, which widened the scope of the interviewee pool. I interviewed employees at both locations, at various levels in the organizational hierarchy and in different functional areas in order to derive a more complete picture of the phenomenon. Interviews generally lasted between 45 minutes and one hour. A total of 40 semi-structured interviews were conducted in English and transcribed. Multiple informants at different hierarchical levels reduced potential informant bias by allowing me to triangulate data and by adding multiple perspectives to the data (Miller, Cardinal and Glick, 1997). The field visits were approximately two weeks long, which allowed for greater opportunities to interact with employees on a more informal basis. This led to several short 'water-cooler' conversations, which helped clarify the sequence of events and the nature of projects – key factors in understanding the upgrading process. On several instances, I engaged in brief follow-up conversations with management to clarify any doubts arising from the interviews.

Interviews focused on the interviewees' personal experiences, their understanding of the relocation, their role in the process and their recollection of events. Due to the iterations between data and theory, each round of interviews was characterized by some dominant themes. Table 3-1 outlines the empirical process, as well as the three main phases of data collection. In phase 1 (November 2012-December 2013), the focus was on identifying the current offshoring situation and understanding the set-up employed by Biztek. In this initial round of exploratory interviews, I asked questions related to the following key themes: (1) specificity of R&D offshoring; (2) challenges related to control and coordination; and (3) key mechanisms

employed to manage ongoing projects. On the basis of the constant comparative method (Strauss & Corbin, 1990), the interview protocol was adjusted over time to address the ongoing upgrading in R&D capabilities, which was identified from the exploratory interviews.

In phase 2 (March 2013-May 2013), I visited the unit in Denmark, where I interviewed managers and employees in order to understand the nature of the upgrade process, the demands associated with relocating R&D, the motivational factors behind this decision and the challenges managers faced. I asked specific questions related to capability upgrading, coordination problems and challenges in alignment. In these interviews, employees discussed the problems they encountered in aligning their capabilities as well as the role of distance. In addition to these interviews, I took part in a number of videoconference calls between Denmark and India. These calls took place as part of the company's alignment strategy. They had two formats. First, weekly update calls were held to discuss daily matters. Second, if a manager from Denmark was visiting the Indian unit, Biztek's management staff (Denmark and India) would participate in a call aimed at aligning strategy, especially with regards to the R&D relocation and efforts to ensure its success.

In phase 3 (September-October 2013), I visited the unit in Chennai while management from Denmark was present. I engaged in extensive interviews, and observed videoconference calls, progress report meetings and strategy meetings among top management.

Table 3-1 Data-collection process

	Phase 1	**Phase 2**	**Phase 3**
Timeline	November-December 2012	March-May 2013	September-October 2013
Focus	Understanding offshoring setup	Identify key challenges in offshoring relationship and relocation process	Fine-grained understanding of R&D relocation and capability-development process
Data-collection method	Explorative interviews	Focus-group interviews; observations	Semi-structured interviews; observations
Respondents	Managerial level	Managerial and operational levels	Managerial and operational levels
Location	Denmark	Denmark and India	India

Overall, I conducted 38 interviews and observed 20 hours of meetings, during which I took extensive notes. Meetings were observed in both locations and most involved employees from both units. Three types of meetings were prominent. Meetings via videoconference were held periodically and scheduled in advance, with the goal being regular updates between the Danish and Indian sides. Second, feedback meetings were scheduled when employees or management from the other location was visiting. These meetings took place in both India and Denmark, and generally involved management and key players on both sides. Finally, meetings were held among members of the Danish management team to determine goals for upcoming projects.

Data Analysis

The focus on the process of upgrading capabilities emerged through an iterative process and ongoing context analysis. From analysis of the interview data, observations from the site visits and extant research on offshoring, I identified several interrelated factors that emerged during the relocation of R&D. An inductive approach combined with data analysis and coding helped to identify the various phases and challenges of relocating R&D.

In order to interpret the data, I used such techniques as constant comparison (Suddaby, 2006) and content analysis (Krippendorff, 2004). This was an iterative process, as I worked through the interviews that were conducted at different junctures. By conducting interviews in both locations, I uncovered varying perspectives that were influenced by contextual factors (e.g., location, organizational membership). This further enhanced the iterative nature of the coding, and I continually analysed the data until I reached theoretical saturation (Bowen, 2008).

I noted several strong statements about differences in routines and mindsets, and about challenges related to reconciling the differences between the two units. In the analysis process, I focused on the routines related to the relocation of R&D. This led to the identification of such terms such as: (1) trial and error, (2) training, (3) formal and informal communication, (4) knowledge management and (5) incentives. I analysed how these terms were used differently in different contexts (e.g., locations and hierarchical levels) and when referring to different aspects of the organization (e.g., individuals, structures and processes).

The analysis yielded some interesting results, including concepts that are not widely discussed in the R&D offshoring literature. In this context, I identified: (1) the challenge of cultivating and developing innovative behaviour; and (2) the distinction between standardized and complex projects, and the corresponding organizational designs these two types of projects require. In the interviews, my focus was on capability development. However, as the interviews proceeded, I was able to articulate a more nuanced view of the capability-development process and the mechanisms underlying the transition from standardized to complex projects. The analysis helped in the development of a data structure (Suddaby, 2006) consisting of first-order constructs, second-order themes and aggregate dimensions (see Figure 1) (Corley and Gioia, 2004; Rerup and Feldman, 2011), which were identified using three questions: (1) How is capability development understood? (2) What actions lead to capability development? and (3) How does relocation affect this process? With this approach, I systematically attempted to combine the capability-development literature with the context of R&D offshoring to iteratively move between data and theory. The themes that emerged from the data are shown in Table 3-2 in the form of representative quotes.

Figure 3-1 Data overview and coding structure

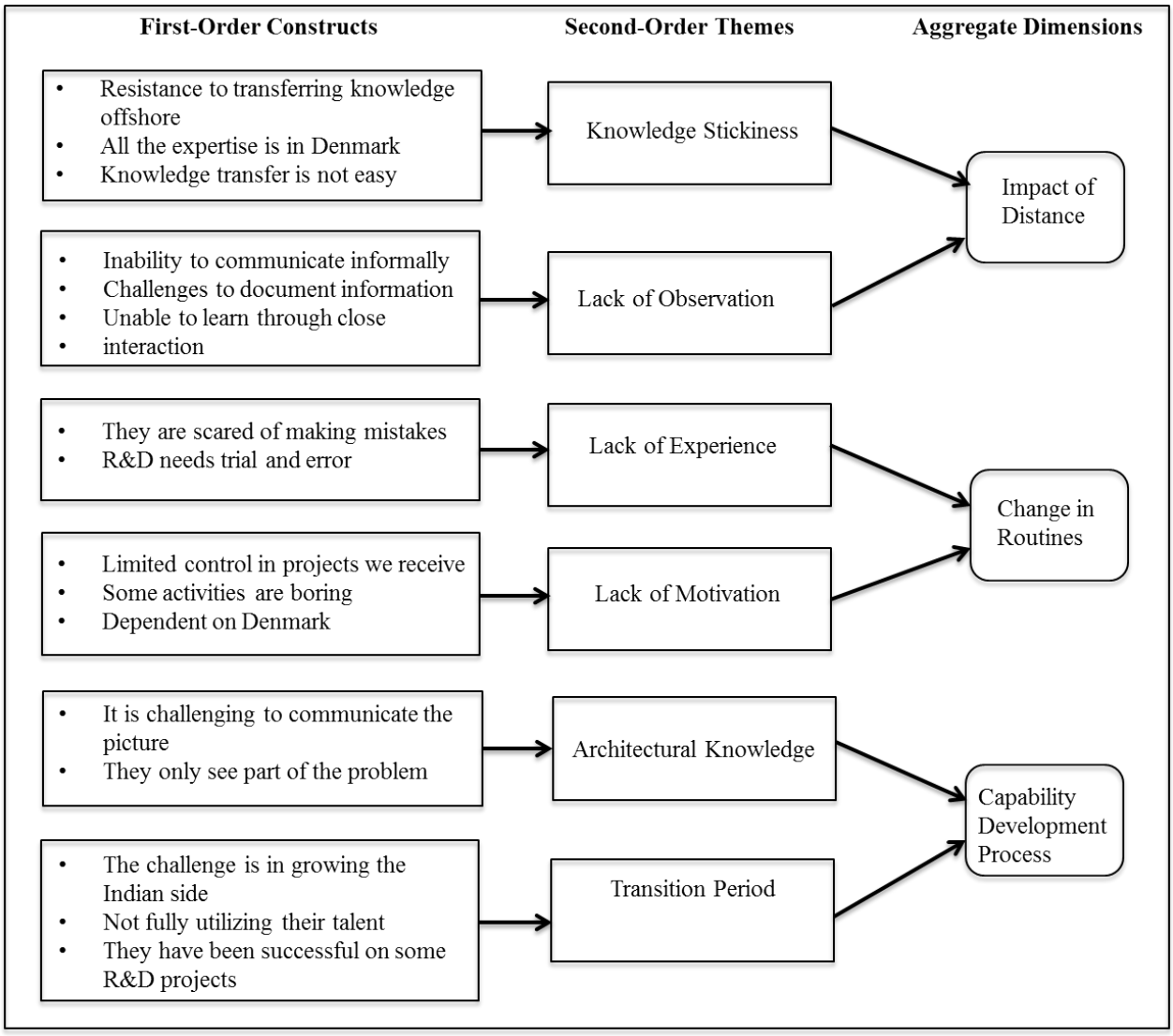


Table 3-2 Supporting Evidence from Data

Second Order Themes	Interview Evidence from Biztec[11]
Knowledge Stickiness	• This unit was started to handle design engineering. Most engineering tasks have been transferred to India. However, the know-how and the specialization have been retained in Denmark (Danish unit). • For complex tasks, more coordination is needed. Even the person who is transferring the task will not be very clear about what he wants in the beginning, even though he will think about or imagine something he wants… He will convey half of it. After seeing the output, he will say 'This is not what I was expecting after 10 days, but he only communicated half of it… Therefore, in the case of a complex task, it is more important to understand the person than to define the technical specification form. (Indian Unit)
Impact of Distance	• If you want to have discussion with the Biztek structural team there [in Denmark], it is very difficult… I am calling from the Chennai structural department and they ask 'What is the problem?' However, when I directly go to them … we sit for one or two hours, and discuss that how we can solve that problem. Phones or videoconferencing can be positive, but it is not always working. (Indian unit)
Architectural Knowledge	• It is possible to offshore that kind of activity, but it also requires a different kind of insight or understanding … because you cannot do it only by being good at engineering. You also have to have some commercial insight. (Danish unit) • Until recently… we did not ask people to think very broadly. That was not the task. Based on feedback from the people here in India who have been in Denmark, I think the Danish organization was not very good at including them in the wide spectrum of thinking. (Danish unit)
Transition Period	• The rationales were to ensure greater engagement from the product managers in the whole area and to start incorporating the unit in Chennai as a part of the group, drawing on the resources, skills and availability of resources in Chennai. (Danish unit)
Innovative Behaviour	• First, we will see if something is within our ability to solve. Otherwise, we will directly go to Denmark and ask for their help… 'This is a new problem – have you already solved something similar?' or something like that. (Indian unit) • They were introduced [in Denmark] to a limited scope of the complex job. In parallel, we started some kind of training in Chennai with a private institute. Then we moved to the second stage. Second-stage people from here were sent to the Danish technical university. Then we also equipped them with computers, software, etc. (Indian unit)
Motivation	• Even when the Indians go to Denmark for specialization, it is not the same thing. They end up being taught specific things. We say: 'OK, just work on this task'. (Danish unit) • For example, if a trip [to Denmark] is two or three months, we will work as what we are doing here [in Chennai]. Then, in the last month or 10 days, we will get training. They give only a small amount of training. (Indian unit)

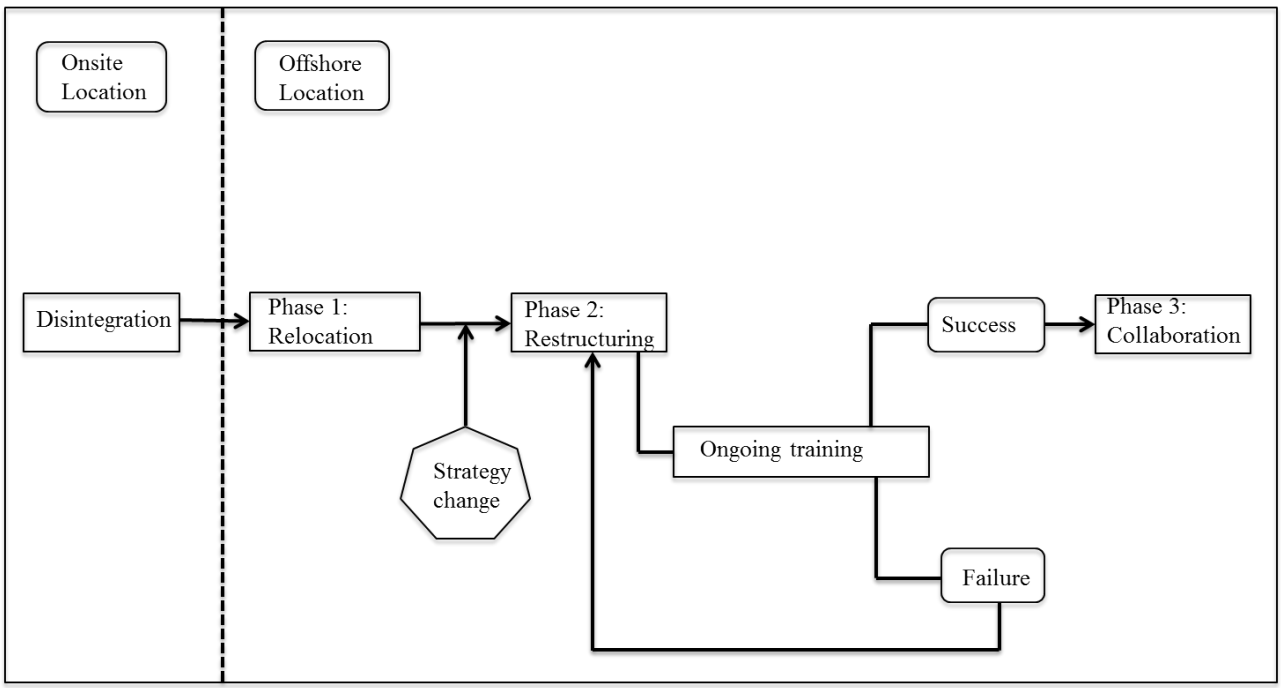
[11] Direct quotes

3.4 FINDINGS: FRAMEWORK FOR THE CAPABILITY-DEVELOPMENT PROCESS

Analyses of process data can be messy and difficult because it encompasses events, activities and choices over time, over multiple levels of analysis, which can be challenging to discern (Langley, 1999). In line with the strategies outlined by Langley (1999), I adopted the *temporal backing strategy*. In this method, the data is broken down into a number of phases, which are not theoretically driven but rather allow for sequential structuring of the data. This strategy allows the data to be transformed into "discrete but connected blocks… and fairly stable or linearly evolving patterns" (Langley, 1999: 703) that can be used to identify key mechanisms that connect the phases and to identify the consequences of those phases.

Capability development is typically represented as a gradual process, as "there is no single point in time in which [capabilities] magically appear" (Montealegre, 2002: 522). Therefore, I developed a process framework using data from the Biztek case study (see Figure 3-2). In the following section, I provide a brief overview of the framework's major components before discussing each phase in the framework and the specific capability development that took within that phase.

Figure 3-2 Process model of capability development



Phase 1: Disintegration and Relocation

This phase is limited to the management of the home unit. The phase involves identification of the activities to be relocated, the choice of location, and the choice of governance mode and development of an interface to manage the interdependencies between the two units. The firm's strategy is crucial in this stage, as it determines the role of the offshore unit. This, in turn, governs hiring and wage decisions, as well as the overall time and investments committed to this unit. This preliminary stage does not constitute an integral part of the framework. Although this stage is beyond the scope of this study, it sets the scene for determining the initial conditions of the framework and the subsequent relationship between the home and offshore units.

Capability development in Phase 1

The initial offshoring decisions determined the technical skills that were needed to perform the tasks, as well as the skills that could be developed through academic training, the skills that could be developed through in-house training and the nature of that training. The offshoring decisions influenced the level of desired capabilities based on the tasks for which these units were responsible. The Chennai unit was initially established to handle standardized engineering activities in order to utilize the benefits of low labour costs in India. These activities were relocated to India, while R&D was retained in Denmark. The relocated tasks required the employees in India to produce the drawings for various industrial-purpose air filters and different components of those filters. Due to the highly standardized nature of these activities, the time and effort required in terms of hands-on training and transfers of tacit knowledge were limited. The capabilities of the Indian employees were developed through short-term training in Denmark. The separation of activities into standardized engineering activities and R&D activities resulted in a lack of synergies. In their short-term training, the Indian employees only received piecemeal skills and information, such that they lacked an understanding of the larger picture. The specialists were kept in Denmark, while the standardized activities were relocated to India, which meant that the level of capabilities in India was much lower than in Denmark. In this phase, the unit in Denmark developed capabilities that enabled it to: (1) disintegrate and relocate activities, (2) coordinate knowledge transfers, and (3) train personnel in India. The offshore unit developed capabilities in: (1) applying formal education to commercial ends and (2) assimilating architectural knowledge. Danish management commented on the engineering expertise of the Indian unit:

They are capable of engineering the product. It is what we call 'standard'. They have the guidelines all of the way through. Basically, we do not have to be involved here. However, when we go beyond the guidelines, then we are needed - Danish manager

Phase 2: Restructuring and Training

Over time, the in-house strategies evolved and required modification in terms of the type of activities for which the offshore unit was responsible. Management needed to determine how to adapt to these changes in strategy and mandates, and then modify the initial task structure. This led to a period of restructuring, which began in management at the home unit, and focused on determining which tasks could be further disintegrated and relocated to the offshore unit. One of the first modifications was made at the organizational level, where the product lines were merged across the offshore and home units, and each product line was organized vertically. As a result, one manager became responsible for all activities related to a particular product line in India and Denmark. The goals of this restructuring were to leverage synergies between the two units and to relocate more R&D activities to India. After this was accomplished, management also needed to engage with the offshore management in order to determine the extent to which the offshore management was capable of performing its newly assigned tasks, the employees who would be responsible for performing those tasks and which necessary skills were lacking in the offshore unit.

Capability Development in Phase 2

The restructuring led to an evaluation of the skills in the offshore unit and an assessment of how the lacking skills could be introduced. The main goal in this phase was to identify the missing capabilities and the mechanisms through which they could be developed in the offshore unit. Danish management noted that the Indian employees lacked open-ended problem-solving skills in addition to general experience in R&D. A decision was made to simply start relocating R&D activities with the expectation that the relocation of complex activities would lead to the development of the necessary capabilities. However, the transfer of complex R&D activities proved challenging for two reasons. First, the distance between the two units implied that the transfer of such activities required clear and precise communication, which put an additional strain on available resources in Denmark and led to management being unable to provide hands-on interaction before relocating tasks. Second, the increased complexity of tasks resulted in

more need for coordination in order to comprehend specific inputs and deliver outputs. Below are representative quotes on the challenges to developing the capabilities in the Indian unit:

It is difficult when they are 10,000 kilometres away. We have a system like Skype, but it is not the same - Danish manager

It would be nice to have the specialists located here. It [R&D capabilities] can grow without them, but slowly - Indian employee

They are just not there yet. They do not have the background or the knowledge. Some of them – many of them – have never even seen a filter. They have only been to school and made the drawings - Danish manager

Danish management had expected the restructuring of the Indian unit to streamline the lines of communication. The removal of additional layers was meant to aid in the identification of specific capabilities that were lacking and make the training of employees easier by reducing the hierarchical layers. Despite these efforts, the expectation that Indian employees would engage in open-ended problem solving represented a deviation from the previous type of tasks performed in India, and the lack of training and engagement from the Danish management led to failure in this regard. Moreover, the Danish management experienced a high level of dependence from the Indian side. The short-term training and piecemeal knowledge transfer that took place in Phase 1 meant that the Indian employees lacked tacit knowledge related to production and needed to increase their exposure to non-specific, development-related activities. Furthermore, the R&D activities required a more comprehensive understanding of the architecture and commercial applications of products, in addition to participation in open-ended problem-solving activities. The Indian employees were experienced in performing standardized activities, but they lacked the know-how and were unable to identify the steps required to undertake R&D. Employees from both units explain the hindrances to capability development:

We are new to this. We do not have much exposure to completely handling [R&D] here. Maybe we can do that in the near future, but the transition is fine for now - Indian employee

Just because they have been doing the task for 10 years does not mean they are ready to move onto the complex tasks. In my opinion, few people are ready to make the shift. Some people can move beyond the technical, and we have to promote them or move them to a non-standard team - Danish manager

In the restructuring phase, management engaged in ongoing training to gauge the level of capabilities and determine how the unit was coping with the increased pressure of performing R&D. Management realized that simply relocating R&D activities to India without providing adequate training led to failures in the performance of these activities, as well as increased strains on Danish management to provide solutions. It also increased the resistance from the Indian management team, as demands on its already limited resources increased. One initial conclusion from the training period was that the capability development in the Indian unit was neither successful nor fruitful. Therefore, an increased emphasis on training was needed and the Danish management decided to adopt a more hands-on approach. Despite the preliminary conclusion that the level of talent available in Biztek India, was much lower than expected, managers attempted to utilize a number of mechanisms in order to shift the standardized mindset toward a more R&D-based mindset:

It is a challenge because we only have one guy here who is good at fabric filters - Danish manager

For example, a number of training sessions were conducted with specialists flown in from Denmark. Moreover, a handful of Indian employees were sent to Denmark for training purposes. Danish managers also identified a number of employees whom they believed had the requisite skills to perform R&D. These employees received training over a period of approximately two years in different forms, including visits to the unit in Denmark, training courses at the Technical University of Denmark and engineering courses in Chennai.

Throughout the course of this training period, the employees frequented the offices in Denmark, where they worked in conjunction with the specialists. Moreover, these employees were assigned a mentor in Denmark who had experience with R&D and product development. In addition to increasing the capabilities of these employees, the goals were to develop their tacit knowledge base and increase their architectural knowledge in order to produce commercially viable solutions. Employees' interactions with their mentors on Skype were not formalized, and employees involved in this training enjoyed numerous informal learning and training sessions with their respective mentors in an attempt to replicate the conditions that would have existed if they were co-located. This access to Danish managers led to success in the attempts to upgrade capabilities. The importance of training is reflected in the quotes below:

We have two people doing what we call 'development work'. We have started a process to bring them up to a higher level … so that we can use them for more than just what they are doing now - Indian employee

When it comes to complex processes, we need more intensive training. We start with some specific people, who must work closely with the Danish specialists for at least one year. First, they only do one part of the complex job, but their responsibilities slowly increase - Indian manager

In this phase, the home unit developed the capabilities needed to: (1) realign the home and offshore units, and (2) streamline processes and communication between the two units. The offshore unit developed: (1) technical capabilities through formal education and training sessions conducted by Danish specialists, and (2) problem-solving and innovation skills through close interaction, observation and engagement with experienced specialists in Denmark. The observations and interactions took place while the Indian employees were visiting Denmark (co-located) and over Skype (distant).

Phase 3: Collaborative Role

After making adjustments to the ongoing training, the attempts at capability development were successful and led to measurable outcomes. The Indian employees had developed two new air filters, D2 and D8. These product-development initiatives had been discontinued in Denmark

due to a lack of resources. The goal was to send these filters to production and launch them globally in 2014. Furthermore, in collaboration with a local supplier, the employees had developed a wireless controller for the filters, which had not previously existed in the Biztek portfolio.

Capability Development in Phase 3

To encourage the burgeoning development activity in India, additional changes were made in the organizational structure. As a consequence of the initial failure in phase 2, a small number of employees from each of the four product lines were transferred to a newly formed R&D department. The creation of this department signified the evolution of the Indian unit, demonstrated the permanency of this shift and encouraged capability development among all employees. As the employees in the Indian R&D units reported directly to the product-line managers in Denmark, they bypassed their immediate managers in India. After the successful collaboration with the local supplier at the offshore site, the Danish management encouraged the offshore unit to play a more active role in engaging with local parties. Attempts were made to enhance Biztek's network to allow for the development of more ideas in partnership and to launch them on a global scale. In this phase, the home unit developed capabilities in: (1) supporting the offshore unit's development efforts by identifying development tasks they could complete; and (2) restructuring the Indian unit to support the development efforts. The offshore unit developed capabilities related to utilizing its external network, collaborating with customers and vendors, and recognizing these external parties as valuable sources of knowledge. The progress made by the Indian unit is represented below:

We have announced that the development team here has completed the D2 and D8 filters and we be rolling them out this year - Danish manager

Initially, they would not agree with our ideas because they were not technically sound. Now, if there is a complication, we analyse it and give them a solution. Either they accept that solution or find a new one - Indian manager

Mechanisms Facilitating and Hindering Capability Development

A number of mechanisms facilitated or hindered the capability-development process in the different phases. Figure 3-3 shows the different mechanisms and highlights the phases during which they were the most salient.

Organizational Restructuring

The organizational-restructuring mechanism was twofold. First, the modification to the Biztek product-line structure allowed for one manager to be responsible for R&D in Denmark and India. In the early stages of the capability-development process (phase 2), clear lines of hierarchy were established, such that managers in both countries were able to identify who was responsible for training and innovation in the respective product lines. This increased the scope of the product-line managers' roles, increased their realm of influence and sent a clear signal to the Indian unit that its

role would be evolving over time. The employees were made aware that the Chennai unit would no longer only perform standardized activities. This was accompanied by frequent visits by the Danish product managers to initiate new projects, which added legitimacy to the mandate change and increased awareness of that mandate among Indian employees.

Second, the reorganization of the Indian unit (phase 3) and the establishment of the R&D division created an impetus to enhance skills. The employees in this unit were privy to increased training, frequent trips to Denmark, higher status within the Indian unit and direct supervision from the Danish management. These factors increased their motivation to undertake R&D activities and to understand the mindset that the Danish management demanded. Key aspects of the restructuring are highlighted below:

We do not create domestic or global products like we used to. Now we have a single setup, so we avoid working separately - Indian employee

"The Danish management thought that it would be better if the development team worked along with engineering, so it would be good if we had one more team here – the transition time would be better and we could reduce the gap - Indian employee

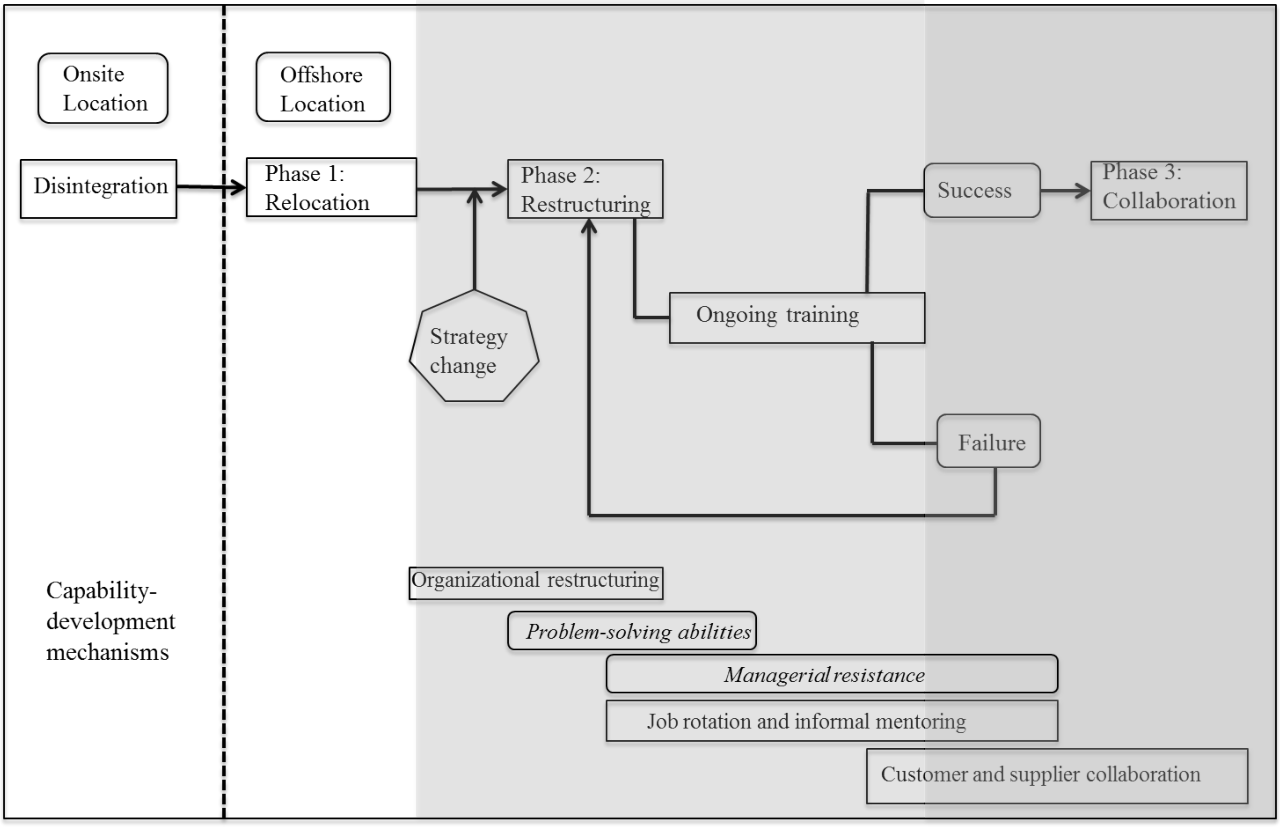
Informal mentoring and training

When attempts at capability development were unsuccessful in phase 2, the Danish management increased the level of informal interaction with employees taking part in R&D activities. For example, employees gained access to management through Skype and maintained a constant chain of communication. Removal of the official lines of communication allowed Indian employees to engage in more informal, relaxed interactions. In a way, this stimulated the conditions similar to those that would have been encountered of being located at home unit and allowed for stronger relationships to develop. Rather than sending a query every time there was a question, which strained the official lines of communication, the informal communication via Skype allowed for a team-like environment, which facilitated open and free generation of ideas. The relevant Indian employees commented on the importance of such communication:

I only work directly with the Danish specialist. He has been training me. I do not need to go to anyone else - Indian employee

We talk a lot on Skype. He has so many years of experience, so I always respect what he says… but he does not always want me to agree with what he says - Indian employee

Figure 3-3 Process model with facilitating and hindering mechanisms



Greater customer and supplier collaboration

Throughout the informal training and mentoring, the Indian employees suggested increased collaboration within their networks. They noted that suppliers and customers in India faced an extremely competitive domestic market and were therefore highly demanding. This presented Biztek with an opportunity to be highly creative. The Biztek team worked in collaboration with its suppliers and customers. Moreover, rather than providing pre-existing solutions available within Biztek repositories, they attempted to move beyond industry frontiers to create new solutions tailored to the local market. These enhanced interactions between suppliers and customers were monitored and encouraged by the product managers and mentors in Denmark. In addition, interactions with suppliers or customers created an impetus for product development and innovation. The ongoing interactions combined with inputs from the local network helped develop innovative capabilities in India. They also provided the Indian employees with greater legitimacy and power. The employees in the development unit were empowered to develop their own networks and to identify employees working for competitors who might have the requisite R&D skills. This not only increased their exposure to the external environment, which provided

new ideas and opportunities for innovation, but also increased their influence in the Indian unit. The quote below reflects the importance of interactions with suppliers:

I travel to most of the sites to understand their requirements … This demonstrates to our clients that the development is driven in such a way that we focus on value enhancement for the client through our product - Indian employee

Managerial resistance

The Indian managers resisted the upgrading of capabilities. They viewed the process as an increased burden on already strained resources. Furthermore, their lack of experience and the high likelihood of failure motivated them to try to limit their exposure. They claimed that this enhanced mandate was not matched with an increase in staff and that, therefore, the unit was unable to carry the load of these additional responsibilities. They also claimed that while they were open to handling R&D, the process of relocation should be much slower than the Danish management desired. This managerial resistance increased following the initial setbacks in capability development. Indian management felt threatened by the increased demands, which it was unable to meet. Indian management commented on the challenges of expanding their role:

When we want to make changes, such as develop a new shape for the filter or develop a new technology, we cannot fit that work into the regular activities. This affects our regular activities - Indian manager

If I only give you a specialist development task, then you will lose your other skills, such as those related to making drawings - Indian manager

Problem-solving abilities

A key factor in the failure of the transformation phase was that the Indian unit lacked support. The Indian unit was used to addressing all complicated questions to the Danish unit, but the Danish unit viewed this practice as problematic when it came to innovation and the culture surrounding it. The Danes claimed that the way to innovate was through trial and error, while the Indian employees were accustomed to consulting organizational documents, textbooks or specialists in Denmark when they needed to solve problems. While the Danes viewed the relocation of R&D as an exercise in learning, the Indian employees simply viewed the new

responsibilities as an additional task that needed to be completed. For the Indian employees, the quickest way to handle this task was to ask the Danish specialists. This caused a significant amount of friction between the management teams on the two sides. The Danes saw this practice as evidence of incompetence on the Indian side, while the Indians claimed that they should be allowed to ask for help, as previous experience had shown that doing so led to success. Danish management commented on the lack of problem-solving abilities:

Here in India, you define point A and point B. Then you have to define point A1, A2, etc., until you reach point B. If you have not made that very clear, the process will stop. People will get confused – they get nervous. They are searching for approval - Danish manager

I gave them a task and asked them to give me ideas. The first thing they said was: 'We will ask Mr A. in Denmark'. I said: 'If you ask him, you will be fired. You have to solve it yourself' - Danish manager

3.5 DISCUSSION

Research shows that mandates to handle R&D are desirable, as they are related to higher status and to more important organizational roles (Birkinshaw and Hood, 1998). Therefore, the Danish management was surprised by Biztek India's resistance to undertaking R&D. In this section I discuss several factors that might explain this resistance and how such resistance can be mitigated. I also examine capability development at the home and offshore units, and discuss the relevance of those capabilities.

Subsidiary Role and Autonomy

Danish management's suggestion to relocate some elements of R&D to India had several consequences for the Indian unit. The first was a shift in resources from engineering activities to R&D activities. The second was the necessity of acquiring the requisite capabilities to conduct R&D in India. The third was increased dependence on the Danish unit for training and knowledge transfer. These consequences resulted in the upheaval of existing routines in order to meet the demands of headquarters (Levinthal, 2000). Therefore, the managerial

resistance can be explained by the interplay between three factors: stickiness of knowledge, change in routines, and subsidiary autonomy.

Firstly, the type of knowledge required to perform R&D is primarily tacit knowledge, which is difficult to transfer and can be described as being sticky (Szulanski, 1996). The challenges of transferring sticky knowledge, especially in an offshoring context are known (Oshri, van Fenema and Kotlarsky, 2008; Youngdahl and Ramaswamy, 2008), for example, the transfer of R&D knowledge may be hampered by its context specific nature (Cramton, 2001), the differences between the home site and the offshore unit (von Hippel, 1994), the embedded routines enabling the application of the knowledge may not be the same in the home site and offshore unit (Desouza and Evaristo, 2004) and the lack of observability (Kumar et al., 2009). In order for the knowledge to be transferred to and utilized efficiently by Biztek India, the employees needed to understand the application of the knowledge, and the processes and sub-processes relevant to the application of this knowledge (Aron and Singh, 2005). Therefore, to develop R&D capabilities, Biztek India needed to be able to apply the knowledge, and incorporate it into their organizational routines to extend their own in-house capabilities. Biztek India therefore needed to shift its focus on carrying out and repeating tasks in order to accumulate capabilities (Birkinshaw and Hood, 1998; Cohen and Levinthal, 1990). From a day-to-day perspective, this meant that Biztek India needed to focus more on learning and problem solving than on performing standardized tasks i.e. this implied a change in routines. Organizational routines are considered to be the repository of organizational routines (Nelson and Winter, 1982); therefore, a change in routines is essential for the development of capabilities (Winter, 2000; Zollo and Winter, 2002). However, a change of routines impacts the day-to-day operations and functioning of organizations and therefore, may lead to the instability of individual and organizational goals, and threaten individual and organizational interests (Becker, 2005; March, 1994; Levinthal, 2000). The change in routines was essential in order for Biztek India's employees to receive the tacit knowledge, understand its application and potential for recombination. Therefore, instead of focusing on the engineering activities where Biztek India was the specialist, they needed to divert their attention to the R&D aspects. This shift in strategic direction was unwelcome because it necessitated an upheaval of well-established and entrenched systems.

As the specialists were located in Denmark, the transition to R&D meant that Biztek India was largely dependent on Biztek Denmark for training, expertise, and transfers of knowledge. Biztek India needed to participate in an on-going period of training and learning because innovation catch-up is a slow process that is reliant on sticky knowledge (Awate et al., 2012). The capability development process is a gradual and cumulative process requiring an extended period of learning and interaction between the home and offshore units (Montealegre, 2002). Biztek Denmark's comparative advantage in R&D (D'Agostino and Santangelo, 2012), combined with the low level of R&D capabilities in Biztek India led to a high level of centralization and a high degree of control exercised by Biztek Denmark (Ghoshal and Nohria, 1993). This extended period of capability development was challenging because it required extra resources and increased dependence on the Danish unit, and in turn led to more centralization, which was a deviation from when Biztek India was primarily performing the engineering activities. The long history of stability between Biztek Denmark and India led meant that the changes in the core features of Biztek India disrupted the organization and increased the probability of failure (Hannan and Freeman, 1984). It was therefore met with resistance. Therefore, I propose:

Proposition 1a: A change in strategic direction is a catalyst of capability development. However, it challenges the status quo within the offshore unit.

The increase in centralization by the home unit reduced the autonomy of Biztek India. The threat of losing specialist status and the risk of failure led Indian managers to resist the change in mandate. While the relocation of R&D processes was in transition Biztek Denmark was in the controlling position, which led to Biztek India having to relinquish their decision-making abilities (Noorderhaven and Harzing, 2009). Loss or perceived loss of autonomy can result in conflicts between the offshore unit and the home unit (Dorrenbacher and Gammelgaard, 2006), which in this case manifested in Biztek India resisting the R&D relocation and capability development. This behaviour questions the common assumption that an upgrade in mandate is desirable for the subsidiary. In the case of Biztek India, being a specialist in standardized activities afforded them, to a large degree, decision-making autonomy, while performing R&D reinforced control from the home unit. The decrease in autonomy was met

with a corresponding lack of motivation and participation in the overall capability development mandated by the home unit. A transition from standardized tasks to development tasks (such Biztek India's transition) is not simple and requires adjustment by the home and offshore units. The Biztek India case shows that when an upgrade in tasks increases dependence on the home unit in order to acquire the necessary capabilities, resistance may emerge. In particular, when the mandate originates from and is monitored by the home unit, then the changes in routines threaten stability, resource allocations are viewed as a loss of autonomy and increase control and capability development efforts are resisted by the offshore unit. However, if the upgrade is initiated through the subsidiary's network and local contacts, and results in capability development, then it is arguably more conducive to the unit's goals and internal strategy (Birkinshaw and Hood, 1998). This leads to some preliminary conclusions about the ability of an established captive unit to upgrade its capabilities. First, a relatively new unit may be more open to capability development than an established unit. Second, a shift into R&D and the corresponding learning process may negate the perceived prestige or reputational benefits that can be derived from upgrading to R&D. There may be greater willingness to participate in learning and training if: (1) the subsidiary is younger and does not have specialist status, and (2) the change in role is initiated by the subsidiary rather than the parent. Therefore, I propose:

Proposition 1b: When an upgrade in role is determined by the home unit, it will be resisted by the offshore unit, as will the required capability development.

Employee Training, Rotation and Mentoring

The geographical separation of the two units and the division of labour between them created an out-group bias (Levina and Vaast, 2008; Tajfel and Turner, 1986). This phenomenon relates to the process of categorization and the impact of group membership on individual behaviours (Stephan, 1985). It is relevant in the context of the relationship between Biztek India and Biztek Denmark. Key characteristics of such behaviour are the assignment of favourable attributes to one's own group, and maintenance of distance between the self and the out-group (Brewer, 1979; Howard and Rothbart, 1980; Turner, 1975). The geographical distance and the separation of tasks (low-end in India and high-end in Denmark) strengthened the separation between the two units, and increased the risk of in-group favouritism and out-group

bias (Hansen, Mors and Løvås, 2005; Tajfel and Turner, 1986). This bias manifested in the Indian management's resistance to the capability-development initiatives.

Out-group bias is solely based on group membership. As the capability development initiative originated from the Danish unit, Indian management resisted the idea. The investments and commitment required for capability development were not met because the Indian management was not on board with making the necessary changes.

The rotation of employees, especially Indian employees to Denmark, for the purpose of training played a significant role in mitigating the negative effects of out-group bias. In his seminal work, Arrow (1962) suggests that cross-labour mobility is a source of inter-firm knowledge spillovers. In other words, knowledge transfers can take place over distances through personnel mobility (Gruenfeld, Martorana, and Fan, 2000; Rosenkopf and Almeida, 2003). After the Indian employees worked in Denmark for short periods of time, they could access Danish employees. They were also exposed to more diversified and specialized knowledge. Upon their return to India, these employees not only brought new ideas but also generated interest in the R&D activities and encouraged other Indian employees to participate in the new tasks. The rotating employees had the opportunity to learn from specialists, which led to successful outcomes in developmental tasks in the Indian unit. The employees who were located onsite gained membership in the Danish group, access to a wider variety of tasks and played a more active role in the allocation of such tasks. The Indian employees relocating to Denmark for short periods of time were exposed to a new way of working and thinking, and had access to a larger, more diverse pool of talent and knowledge. Therefore, while the group boundaries still existed, access to the out-group allowed the Indian employees to generate new ideas, which also affected their problem-solving abilities and mindsets. Therefore, I propose:

Proposition 2a: The rotation of employees as part of ongoing training facilitates innovative capability development for the group with the lower capability stock.

Informal mentoring can also facilitate capability development, as it facilitates transfers of tacit knowledge, the communication of nuances and problem solving. Informal mentoring also simulates co-location by increasing accessibility between the mentor and the protégé, and by fostering a close relationship between the two (Shah and Bandi, 2003). Informal

relationships focus more on longer-term goals and mentors may even place protégés' interests above those of their organization. Long-term mentor relationships foster knowledge transfer and can uplift the overall competence of the protégé. Protégés in informal mentoring relationships reported higher levels of organizational socialization, job satisfaction and salary. In an offshoring context, where the rotation of employees is often short term in nature, long-term informal mentoring allows for commitments of resources on an ongoing basis and for the mentor and protégé to form a close bond. Mentoring can also help overcome out-group biases, as the relationship between the mentor and the protégé is more important than organizational dynamics (Mezias and Scandura, 2005). Therefore, I propose:

Proposition 2b: The informal mentoring of employees facilitates capability development for the group with the lower capability stock.

What capabilities are actually developed?

Table 3-3 lists the capabilities that are developed in each phase of the capability-development process. Interestingly, the starting point of this paper is the lack of R&D capabilities in the offshore unit. However, I find that both the offshore unit and the home unit need to develop capabilities, albeit different types of capabilities.

Table 3-3 Capabilities developed by the home and offshore units

	Home Unit (Denmark)	Offshore Unit (India)
Phase 1	Transfer of explicit knowledge; disintegration and relocation of tasks	Combine education with industry context; understand and assimilate transfers of explicit knowledge
Phase 2	Coordination, restructuring and communication between the units	Acquire technical skills through formal education and teaching sessions held by specialists; develop problem-solving abilities through close interaction with mentors
Phase 3	Creation of development unit within the offshore unit; collaboration with offshore unit	Recognize local network as a source of knowledge; networking capabilities; collaboration with external parties

The offshore unit is lacking capabilities in order to perform the development tasks relocated to India. The employees need to develop or enhance their existing knowledge base and apply its knowledge to commercial ends, which requires critical thinking and judgement skills. This represented a significant departure from the unit's initial role of handling standardized activities. The phase model (figure 2) shows a gradual progression from acquiring (explicit and tacit) knowledge to critically applying that knowledge to collaborating with the external network to further enhance the commercial application of the knowledge and utilizing the external network as a source of novel ideas. This gradual progression of capability development builds up to the offshore unit utilizing its external network.

Together, these steps represent a significant development of the pre-existing repertoire of capabilities, as well as the development of learning capabilities (Cohen and Levinthal, 1990) and integrative capabilities (Henderson and Clark, 1990; Kogut and Zander, 1992; Pisano, 1997). The offshore unit developed their learning capabilities, which "involve the development of the capacity to assimilate existing knowledge" (Cohen and Levinthal, 1990: 130). Through repeated actions, the offshore unit began to assimilate the tacit and explicit knowledge they received from the home unit in the form of documents, training sessions, mentoring etc. During this process, the employees at Biztek India did not need to produce any new knowledge or apply it to commercial ends; their application was limited to assimilation and understanding of existing knowledge developed in the home unit. These capabilities allow the employees to combine the knowledge they receive from the home unit and apply it creatively and lead to novel linkages and associations (Cohen and Levinthal, 1990). These capabilities represent the ability to acquire and assimilate knowledge, and eventually, recombine the knowledge. The Biztek India employees demonstrated their learning capabilities when they took over the responsibility of the two discontinued filters and developed them successfully. The capabilities to develop the filters were already present in Biztek Denmark; therefore, these capabilities were not new to the organization, though they were new to Biztek India. Prior to the relocation of R&D the Biztek India employees would have been limited in their expertise to develop two new filters.

In phase 3 the offshore unit engages with local customers and suppliers and develops a wireless controller that was new to the organization. Through collaboration with a supplier, Biztek India developed a controller and showed the ability to recognize a potentially

valuable idea, the commercial application of the idea and the recombination of internal and external sources of knowledge. The absorption of external sources of knowledge blended with firm specific technical competencies represents integrative capabilities (Henderson and Clark, 1990; Kogut and Zander, 1992; Pisano, 1997). Arguably integrative capabilities are more complex than learning capabilities as they require the recognition of valuable external knowledge in addition to assimilating them. This indicates capability development of increasing sophistication in Biztek India. From a critical standpoint it can be argued that Biztek India did not introduce novel knowledge within the organization, or create any path breaking innovations. However, they did begin to understand the process of R&D, and began to participate in the capability development necessary to minimally accomplish some development tasks. This is a deviation from their existing role, and the Indian unit needed to overcome their path dependence to perform any R&D related activities.

In order to facilitate the relocation of R&D to India, the home unit needed to strengthen its own offshoring capabilities related to coordination, communication and alignment with the offshore unit. Some of the home unit's capabilities, such as coordination of relocated tasks, coordination of the increased demands associated with interdependence, and realignment and restructuring of the units are enhanced. This is consistent with Jensen et al.'s (2013) observation that the home unit also needs capabilities in order to effectively relocate activities.

In phases 2 and 3, organizational changes, such as realigning the product lines and creating a separate development unit, are accompanied by training and close interaction, which lead to capability development and tangible success in this process. Therefore, the undertaking of R&D also requires supporting structures within the organization. The organizational-design literature highlights the importance of the organizational changes that offshoring necessitates (Kumar et al., 2009; Larsen et al., 2013; Srikanth and Puranam, 2011). Biztek Denmark developed structural and interface management (Manning et al., 2012) capabilities. I define structural capabilities as the ability to realign the home unit and offshore unit based upon the task and coordination requirements. Restructuring within Biztek India and establishing a different department simplified the coordination, reduced complexity and allowed for faster decision making (Weiss, 2007). The decision to create a new R&D unit reflects the ability to address the changing role of Biztek India and to have a corresponding change in the organizational structure. Often, the offshoring literature assumes that the success or failure of

such ventures relies on the skill level available overseas or the governance mode in question (Lewin et al., 2009; Weigelt, 2009). I show that the skills available in the offshore location are not the only relevant factor – the supporting structures and actions that are closely related to coordination capabilities affect the success or failure of such ventures.

Offshoring complex tasks can result in the development of capabilities in the home unit purely as a consequence of the relocation, for example, Manning et al. (2012) examined how firms develop interface management capabilities in order to disintegrate, relocate and reintegrate tasks into larger workflows. This finding is consistent with Jensen's (2009; 2012) findings that through the experience of offshoring, firms develop capabilities that improve their ability to offshore in terms of more transparent workflows, better documentation and technical capabilities. Biztek Denmark had no prior experience in relocating R&D; therefore, they gained the experience in successfully disintegrating and relocating tasks to Biztek India. Their prior experience in disintegration was limited to standardised tasks, which are much more reliant on explicit knowledge and therefore, easier to transfer. Similar to Manning et al.'s (2012) study on distributed R&D, Biztek Denmark gained the ability to specify and explicate R&D knowledge, consequently reducing the ambiguity surrounding these tasks. The relocation of R&D to an offshore unit leads to increased interdependencies (especially when compared to standardized activities). Therefore, the interface management capabilities developed by the home unit address the increased coordination demands arising from these interdependencies. The existing headquarter-subsidiary literature has primarily focused on the actions the subsidiary needs to take when upgrading roles (Andersson et al., 2007), therefore, an examination of the upgrade process identifying the capabilities developed by the home unit adds to this stream of literature. I find that in the offshoring context, both units need to develop their capabilities, even though the capabilities are different in nature, therefore, I propose:

Proposition 3: Capability development in the offshore unit is supported by capability development in the home unit to support the increased interdependencies between the two units.

3.6 GENERALIZABILITY OF FINDINGS, LIMITATIONS AND FUTURE RESEARCH

The process model presented in this paper is based on one specific organization. However, aspects of the model are generalizable to other cases of capability development in an offshoring context. The roles of the catalyst, organizational restructuring and development mechanisms apply to other similar situations. As the capabilities developed and the facilitating mechanisms are not exhaustive, they can be built upon in future research.

There are some inherent limitations to the method applied in this study. It can be difficult to predict whether the findings from the case will be generalizable ex ante (Flyvbjerg, 2006). Although efforts were made to include a large number of interviews and observations in this study, they may not be representative of all R&D-relocation processes. Moreover, the interviewee responses may have been subject to hindsight bias in cases where the data were retrospective.

The case used in this study relates to a widespread phenomenon, and the propositions developed cover causal relationships that can form the basis of investigation in studies with a larger number of observations. Findings from this study can also be extended by examining the relocation process longitudinally and across different industries. In addition, the strength of the salient mechanisms identified in this study can be tested using quantitative data. I have aimed to explicate the process of capability development. In so doing, I have identified certain challenges in the process, such as cultivating the mindset required to perform R&D. Future longitudinal, qualitative research could also examine how firms attempt to cultivate such mindsets.

3.7 CONTRIBUTION AND IMPLICATIONS

Few studies examine the process through which capability development takes place –this paper addresses that gap in our understanding. I attempt to explain how this process unfolds, as well as the different capabilities and the mechanisms through which they develop. I also present a case of a pre-existing unit that has limited resources but is assigned new R&D responsibilities, and must therefore make investments in capability development.

My aim has been to examine the process of capability development and shed light on this often black-boxed process. I have adopted a learning perspective to explain capabilities and their development as a deliberate firm-level investment involving a search and learning

process to modify or enhance existing capabilities in response to an internal or external change agent resulting in improvements within the firm. This definition allows for a clearer understanding of what capabilities are, and where and how they develop. R&D is increasingly being disaggregated and performed in a distributed context (Contractor et al., 2010). Therefore at varying levels of disaggregation the capabilities required to perform R&D may differ. In this study I identify learning and integrative capabilities to be the stepping stone for a relative novice to perform R&D. As mentioned, these capabilities could potentially lead to new innovations; however, they signal a departure from performing standardized tasks with high levels of predictability to performing for abstract tasks. I have also attempted to identify the capabilities (structural and interface management) that are essential to deal with the configuration and coordination challenges associated with offshoring. Capabilities related to offshoring are no longer niche as offshoring increasingly becomes ubiquitous.

To the offshoring literature, I add the dimension of a unit's transition and I extend the 'either-or' typology. On the basis of rich, in-depth qualitative interviews, I articulate the upgrade process for an offshore unit and the corresponding challenges. I also show that such an upgrade requires the participation of both the home and offshore units because of the increased interdependencies between the units. While the availability of talent may be high in a particular location, the ability and motivation of the unit plays a crucial role in the success or failure of capability development and subsequent R&D relocation.

Finally, I add to the subsidiary-mandate literature. By presenting a case in which the mandate precedes the requisite capabilities, I deviate from the common assumption that subsidiaries always attempt to upgrade their roles within the organization, and show that such upgrades can be accomplished through the undertaking of R&D or complex activities. The Biztek case demonstrates that opportunities to perform R&D are not necessarily met with positive responses, as they place significant demands on internal and scarce resources.

This paper also has several managerial implications. First, the relocation of R&D to a unit performing standardized activities is a real-world phenomenon that presents managerial challenges. This paper was inspired by conversations with managers attempting to maximize the functioning of an offshore unit. Therefore, its focus has been on identifying specific challenges as well as mechanisms appropriate for dealing with them. More specifically, it has centred on identifying mechanisms for addressing the capability-development challenge. Second, by

conducting interviews at various hierarchical levels, this paper provides perspectives from different organizational levels. These diverse viewpoints can provide management with a holistic perspective on capability development and possible barriers at different levels within the organization. Third, this paper attempts to pinpoint specific capabilities that may be lacking in the home and offshore units that can facilitate the relocation of R&D. By identifying such capabilities, I have attempted to simplify the process of relocating R&D and upgrading capabilities in an offshore unit.

Chapter 4: Capability development, Proximity, Connectivity: Evidence from the Nascent Digital Creative Industries Cluster in Bengaluru[12]

Manya Jaura[13] and Mark Lorenzen[14]

Abstract: Comparing the role of local firms and MNE subsidiaries, we investigate firms' development of capabilities and how they impact the development of clusters. To this end, we undertake an explorative case study, based on primary self-collected data, of the digital creative industries cluster in Bengaluru (India). Building on this study, we propose that while MNE subsidiaries build capabilities fast, they are narrow and have modest spillovers to cluster capabilities. By contrast, while local firms build capabilities more slowly, they are broader and have greater potential to spill over to cluster capabilities. These effects are moderated by local market size as well as technological modularity. We point to the role of connectivity for capability development, paying particular attention to how local firms leverage international personal relations.

Keywords: capability development, cluster, culture, connectivity, offshoring, animation

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4.1 INTRODUCTION

Increasingly, international business (IB) and economic geography (EG) are taking advantage of each other's comparative advantages (Beugelsdijk et al., 2010). Whereas IB has traditionally been concerned with how the strategy of multinational enterprises (MNEs) is influenced by national borders and institutions (McCann and Mudambi, 2005), EG's core concern is the effects of proximity and place (Lorenzen et al., 2012). More specifically, EG's analysis at network level is complementary to IB's analysis at firm and national levels, paving the way for analyzing not just how MNE strategy adapts to locations, but also how such locations change as a result of diverse and interacting firm strategies.

The synergies between IB and EB are embryonic and more research is needed in order to enrich the core IB concepts. In this paper, we take steps towards such theory development. We investigate two core IB concepts, capability development and cultural distance. By complementing IB's and EG's levels of analysis, our approach addresses three research gaps common to extant research on these two core concepts. First and foremost, the extant analytical perspective in IB is largely static. Extant research black boxes the processes of capability development in order to focus on its outcomes (for exceptions, see Montealegre, 2002; Parida, Wincent and Kohtamäki, 2013). Furthermore, extant research analyzes ways of mitigating for negative effects of cultural distance, but assumes that such distance remains unchanged (Shenkar, 2001), By contrast, our approach is dynamic, addressing the processes through which these phenomena change over time, i.e. how capabilities develop and how greater cultural proximity may emerge.

Second, extant IB research has primarily studied capability development at the firm level, ignoring lower levels (e.g. projects and teams) or higher levels (e.g. cluster and region) of

analysis (Foss, 1996; Lahiri and Kedia, 2009; Un and Montoro-Sanchez, 2010). Concerning cultural distance, extant research typically analyses it as a national phenomenon, ignoring regional or local levels of analysis. Our approach takes inspiration from the observation that collective capabilities and cultural institutions can be influential in attracting new entrants and investments to clusters (Zaheer, Lamin and Subramani, 2009). Analyzing the dynamics of capability development and development of cultural proximity at the cluster level, a core question is how firm-level processes aggregate to collective phenomena. Examining spillovers of knowledge and skills from firms to clusters, our analysis may improve extant research's limited understanding of how clusters emerge and evolve (Manning, Ricart, Rique and Lewin, 2010).

We address a third gap in extant research: Partiality. Extant IB research takes the strategic perspective of parent MNEs or international clients, paying scant attention to other parties of international business relationships. In particular, the literature on offshoring has disregarded local firms, who have been considered subordinate in supplier relationships (Luo, Wang, Zheng and Jayaraman, 2012). However, recent examples of Indian ICT services and Chinese manufacturing (Ge and Ding, 2008) suggest that while MNEs possess comparatively more developed capabilities, local firms can develop theirs and become global competitors through various catching up mechanisms. Our approach, therefore, includes the perspectives of MNEs as well as local firms. In sum, the paper poses the following research question: How do knowledge and skills spill over from firms to develop cluster capabilities and cultural proximity?

The paper's research strategy is to use an explorative case study to develop testable theoretical propositions. Our empirical setting is the digital creative industries (DCI):

Animation, visual effects (VFX) and games. This sector constitutes a fruitful setting because it is young, its technologies and markets are emerging, and its patterns of MNE activity are under development. We undertake a case study of the DCI cluster in Bengaluru (India). We selected this cluster because it is a latecomer to the DCI and currently experiencing MNE entry, allowing us to juxtapose the development of local firms with MNE subsidiaries. Studying a cluster in such a nascent stage furthermore makes is easier for us to discern relationships and causalities.

First, our case study identifies the development of DCI cluster capabilities in Bengaluru. Most notably, the cluster is developing a skilled labor pool and a local industry association undertaking political lobbying, promoting international-grade animation courses, arranging conferences and fairs, and establishing a startup incubator. We find that local firms and subsidiaries develop two broad categories of capabilities: the first relates to general animation skills and the second are relational capabilities developed through working with international clients. Furthermore, there is evidence that local DCI labor is undergoing a slow process of developing cultural proximity to international markets for DCI products, in the guise of understanding the necessary content quality levels and the aesthetics, customs and preferences of foreign consumers.

Next, the case study analyzes the processes of developing capabilities at the firm level and how it spills over into the cluster. We find that DCI capabilities are developed particularly rapidly by MNE subsidiaries, through transfer of technical knowledge from parent firms. Subsidiaries operating in animation and mobile games industries, where Indian and East Asian markets are sizeable, also obtain mandate from their parents to develop final products. Compared to local firms, however, MNE subsidiaries have fewer spillovers to cluster capabilities: subsidiaries refrain from using local suppliers due to tight integration into their

parents' value chains, as well as strong concerns of safety and security. By contrast, local firms' use of local suppliers is contingent upon technology: While in animation and visual effects industries, the use of local suppliers is modest, in the games industry, task modularity facilitates the use of local suppliers as well as spin-offs of new firms. Furthermore, local firms are highly incentivized to participate in the development of cluster capabilities through participating in the local industry association, while MNE subsidiaries are less committed. Several of them entered Bengaluru in a low-commitment mode, through 'dedicated units' hosted by an incumbent firm.

Third, we analyze how the capabilities developed by firms compensate for their cultural distance to international DCI markets may create cultural proximity in the cluster. MNE subsidiaries make their employees grasp the cultural aspects of international markets by transfers of personnel and cultural knowledge from parent firms. By contrast, in local firms, cultural knowledge is disseminated to employees by managers who obtained it through their personal connections to former employers, early customers, friends or family in Europe and North America. The case study finds that the presence of rapidly expanding MNE subsidiaries lowers spillovers of cultural knowledge from firms to cluster: by offering attractive career opportunities, MNE subsidiaries currently appropriate an increasing share of the skilled DCI labor in Bengaluru, and further reduce the generally low Indian labor mobility. Hence, the emerging cultural proximity at the cluster level is mainly due to collective investments in education. In this process, as mentioned, local firms are more active compared to MNE subsidiaries.

Our findings on capability development at the firm level and the role of MNEs align with extant theory. Other findings on capability development at the level of the cluster and of the role of personal relationships in the development of cultural proximity, complements and

extends extant theory. They tie to the emergent theme connectivity at the intersection of IB and EG research (Beaverstock et al, 2002; Lorenzen and Mudambi, 2013; Cano-Kollmann et al, 2016). The paper develops theoretical propositions on the basis of these findings, and discusses how they relate to extant research. The paper is structured as follows. Section 2 presents its theoretical foundations, and sections 3 and 4 outline the paper's empirical setting and method, respectively. Section 5 presents the empirical findings, and section 6 discusses these, positions them to extant literature and develops five testable propositions.

4.2 THEORETICAL FOUNDATIONS

Firm capabilities

In this paper, we examine the process of capability development. We assume that firm capabilities spill over and aggregate into cluster capabilities. In the following, we will examine these two levels of analysis in turn.

Firm-level (organizational) capabilities can be defined as "a high level routine or collection of routines that together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type" (Winter, 2003 : 991). The capabilities of a firm rests upon processes such as organizational and managerial integration, learning, reconfiguration and transformation, a firm's assets, and paths to achieving strategic outcomes (Amin & Cohendet, 2004). Capabilities and their importance to organizations have been covered widely in the organizational literature (see Hoopes and Madsen, 2008); recent research has explained capability development to be a process, as there is 'no specific point in time when capabilities appear' (Montelagre, 2002: 522). While this stream of research is nascent (Parida et al., 2013), the argument made is that through

co-evolutionary forces, requiring time and investment, organizations can improve upon and further develop their in-house capabilities.

Through deliberate investment in organizational structures and systems (Zollo and Winter, 2002), and learning through trial and error (Cyert and March, 1963) firms can develop their in-house capabilities. Capability development is path dependent because past actions and previous knowledge residing within the firm impact future actions of the firm and further investments in capability development (Lane and Lubatkin, 1998; Parida et al., 2013; Sirén, Kohtamäki and Kuckertz, 2012; Sydow, Schreyögg, and Koch, 2012; Zahra and George, 2002). At an organizational level, capabilities are developed through different forms of repetitive activity (Hoopes and Madsen, 2008; Makadok, 2001), the recombination of knowledge and skills of individuals within and across firm boundaries (Gittelman and Kogut, 2003); and integrating diverse knowledge bases (both internal and external to the firm) (Henderson, 1994; Iansiti and Clark, 1994). Our focus in this paper is on operational or functional capabilities, which allows a firm to make a living and develop its technical knowledge (Amit and Schoemaker, 1993; Prahalad and Hamel, 1990; Winter, 2003) and recombinative or integrative capabilities (Grant, 1996; Henderson and Clark, 1990; Kogut and Zander, 1992), as such capabilities allow firms to absorb knowledge from external sources and combine the different technical competencies developed in various units within the organization.

Firm capabilities are also a theme in IB research. Here, the dominant concern is how location abroad (for instance, in a cluster) influences the capabilities of the MNE and its foreign subsidiaries, defined as operational units controlled by the MNE situated outside the home country (Birkinshaw, 1997). Arguably, the process of capability development unfolds differently in MNE subsidiaries and local firms undertaking international business activities.

The latter, defined as independent locally-owned exporters, often perform offshored activities, i.e. supplying components or services according to a set of predefined metrics (Lewin, Massini and Peeters, 2009). Compared with locally owned firms, subsidiaries experience faster capability development due to their ability to leverage the knowledge residing in the parent company (Argote and Ingram, 2000; Kogut and Zander, 1993). Subsidiaries typically have stronger capabilities compared to local firms, which, is reflected in shorter innovation cycles and order fulfillment lead times (Erhun and Tayur, 2003; Sahin and Robinson, 2002; Sanders and Premus, 2002). Furthermore, knowledge from parent companies may allow managers of the local subsidiary to detect environmental trends, earlier inflection points and respond to changing competitive rules. Finally, capabilities may also be transferred to subsidiaries through transfer of employees (Grant, 1996). However, capability development is path dependent, and is influenced by past experiences and knowledge (Amit and Schoemaker, 1993), therefore if the subsidiary mandate is limited to straightforward tasks such as local market adaptation, then its relative absorptive capacity (Lane and Lubatkin, 1998) and receiver competence (Mudambi and Navarra, 2004) will be low, and will limit the nature of capabilities the subsidiary develops.

Local firms that export and supply international clients often perform specific aspects of the client's value chain. Until recently, IB research focused on local firms performing less complex and modularized activities, however, increasingly, scholars point to local firms attracting more value added activities (Lewin et al., 2009; Manning et al., 2008). In extant research, local firms have been considered subordinate in relationship to their clients; however, recently there has been more focus on understanding local firms' capability development and catch-up in the terms of 'leapfrogging' or 'springboarding' into global markets (Hobday, 1995). One exception is Ethiraj et al. (2005), who examine two specific types of capabilities crucial for

local service providers who supply international clients: client-specific capabilities and project-management capabilities. Some research has emphasized relational capabilities and social exchanges that relate to the offshore outsourcing context with its client-provider relationship (see Vivek, Richey, and Dalela, 2009). Relational exchanges between a client and a local firm foster the transfer of knowledge and intangible assets, and can lead to the development of joint capabilities (Vivek et al., 2009). Through interaction with the client located in an advanced region, arguably possessing more knowledge in some domains (D'Agostino, Laursen and Santangelo, 2012), local firms located in less advanced regions can develop the capability to reconfigure resources to meet client requirements, leading to an efficient use of resources and the development of commitment between partners (Nooteboom, 2004). Consequently, local firms benefit from improved performance, lower coordination costs, development of in-house capabilities, which in turn makes them more attractive to other clients (Vivek et al., 2009). By meeting the clients' demands, the local firms can develop knowledge and capabilities that are essential to the client and can develop further competences to cater to the clients' future needs (Barthélemy and Quélin, 2006). The capability development of local firms acting suppliers to international clients can also be viewed through Matthews (2002, 2006) linkage-leverage-learning model. Though the model was developed to explain the accelerated internationalization of dragon multinationals, it can also be applied in the context of the growth of local service providers (Matthews 2002, 2006). The main mechanism explaining the capability development for local firms has been through client interaction; local firms form a link between themselves and foreign clients; use these linkages to leverage knowledge and resources, and move up the value chain; and repeated linkages and leveraging leads to the local firm developing their in-house capabilities such as pace of diffusing knowledge, organizational stock of knowledge, ability to assemble a team etcetera.

Firm capabilities and cultural distance

One type of capabilities that has received particular attention in the literature are those that compensate for "cultural distance", defined as differences in routines and established practices (Edquist and Johnson, 1997), norms and beliefs (Kogut and Singh, 1988)[15]. Potential costs of cultural distance faced by all firms that operate across locations characterized by different cultures (Johanson and Vahlne, 1977). Local firms exporting to culturally different markets experience challenges with supplying components or services with the correct content and quality levels, as well as, coordinating processes across different expectations and practices (Johanson and Vahlne, 1977). MNEs investing in unfamiliar locations may find it difficult to operate effectively (Gomez-Mejia and Palich, 1997; Hennart and Larimo, 1998). Lack of familiarity with local demand may make them unable to appeal to the local consumers or clients and establish local sales channels, (Zaheer and Mosakowski, 1997). Subsidiaries may also face high transaction costs in their negotiations with local suppliers and partners, because culturally distant firms will need to renegotiate deals and find it more difficult to share tacit knowledge reluctant to share (Shenkar, 2001). They will also take longer to establish mutual trust and relational contracts (Baker, Gibbons, & Murphy, 2002; Sako and Helper, 1998).

Therefore, firms that operate internationally need to invest in developing capabilities that allow them to compensate for the costs of operating across cultural distance (Kogut and Singh, 1988; Anderson and Gatignon, 1986; Agarwal, 1994). The literature on local firms conceptualizes this as a learning process of gradually acquiring cultural knowledge of their most important export markets, a process which takes time and incurs high costs (Johanson and

[15] The notion of 'cultural' distance builds upon Johansen and Vahlne (1977)'s early work on 'psychic' distance (Håkansson and Ambos, 2010).

Vahlne, 1977). In the IB literature on MNE, the emphasis has been on entry mode (Barkema, Bell and Pennings, 1996) and subsidiary management (Roth and O'Donnell, 1996), and how these relate to performance (Gomez-Mejia and Palich, 1997; Morosini, Shane and Singh, 1998). The dominant view is that MNEs should invest in locations that are similar to MNE home countries and hence entail low cultural distance (Johanson and Vahlne, 1977), and if that is not possible, then MNEs should choose a mode of entry that compensates for cultural distance. Joint ventures are low-control and should only be used if there is a need to access technology from strong local firms (Brouthers, 2002; Hamel, 1991; Mowery, Oxley and Silverman, 1996). Greenfield investment is higher-control, but entails lengthy processes of becoming familiar with the local landscape (Hymer, 1976) and entering into network relations with other local firms (Johanson and Vahlne, 2009; Johanson and Vahlne, 2009). Acquisition is a fast process of obtaining local knowledge and becoming locally embedded (Dunning, 1993; Petersen and Pedersen, 2002; Slangen and Hennart, 2007; Lorenzen and Mahnke, 2004). However, this shifts the problem of cultural distance inside the MNEs: The challenge is now to build capabilities of understanding and managing across the different routines, norms and beliefs of the locally embedded subsidiary and the MNE parent abroad. Therefore, headquarter-subsidiary relationships need to be carefully designed in order to compensate for cultural distance existing within the firm (Singh, 2007).

Cluster capabilities and cultural proximity

We can analyze capabilities not just at the organizational level, but also at the level of networks among firms and organizations such as trade associations, universities and public service providers. Dense and geographically concentrated networks in similar or related

industries in particular geographical locations is what is typically referred to as "clusters" (Humphrey & Schmitz, 1996; Bresnahan, Gambardella and Saxenian, 2001; Manning et al., 2010). Even if there is high competition among clustered firms (Porter, 2000; Shaver and Flyer, 2000), such firms are typically more responsive to opportunities and environmental risks and experience comparatively high growth (McCormick, 1999). MNEs may also be attracted to being located in clusters in order to 'plug into' local dynamics (Lorenzen and Mahnke, 2004).

Such competitive advantage accrues from what we, by analogy to firm capabilities, may refer to as 'higher-order' capabilities (Foss, 1996), 'regional competences' (Lawson, 1999), or simply 'cluster capabilities' (Zaheer et al., 2009). Such capabilities that may arise as "*the result of the combination and interaction of all the localized elements self-reproduced and self-reinforced in the spatial context, including the strategies of located firms (Porter 1990), all of them generating competitive advantages capable of upgrading the territory"* (Hervás-Oliver and Albors-Garrigos, 2007: 114). The most fundamental cluster capability is the existence of a specialized local labor pool (Morosoni, 2004). The availability of highly skilled labor is, of course, an advantage to all firms in a cluster. However, the level of experience as well as the degree of flexibility in the local labor market is an important cluster capability, in particularly for project-based industries relying on freelancers and temporary employment of project workers (Grabher, 2002). Another, much cited, cluster capability is spillovers of technical knowledge between firms, and between firms and universities. In well-functioning clusters, technical knowledge may be, with Marshall's words "in the air") (Marshall, 1920).

Cluster capabilities may also entail a particular dominant culture in terms of shared norms, conventions and beliefs (Foss, 1996). Such culture facilitates a balance between competition and collaboration among local firms, and makes knowledge spillovers more

abundant (Maskell and Lorenzen, 2004). The dominant local culture in a cluster may not align with national culture: Compared to the rest of the country where it is located, a cluster may have a higher level of cultural proximity to particular other locations (Boschma, 2005; Knoben and Oerlemans, 2006). This is, of course, relevant to local service providers as well as subsidiaries in the cluster. Both may benefit from lower cultural distance, as a consequence of being located in the cluster, when doing international business with firms in international markets. This argument of cluster-level cultural proximity may explain the mixed results in research on how national cultural distance influences MNE entry modes (Barkema et al., 1996; Benito, 1997; Erramilli, Agarwal and Kim, 1997; Tihanyi et al., 2005).

What distinguishes cluster capabilities, both technical and in the guise of cultural proximity, is their emergent nature: They are the result of combinations and spillovers of knowledge and skills of single workers, firms and other local organizations (Schmitz, 1995). This beckons the question of how cluster capabilities and cultural proximity emerge as an aggregation of firm-level processes. We now turn to this problem.

Spillovers from firms to clusters

An initial observation in the analysis of how firms influence cluster capabilities and cultural proximity is that capabilities and culture are collective properties, and as such, cannot be transferred. However, the way firms develop capabilities and compensate for cultural distance crucially impacts their knowledge and skills spillover to other firms and to the local labor market and this, in turn, aggregates to the cluster level. In the literature, it is generally accepted that the level of spillovers is determined by local embeddedness and linkages, both

formal and informal (Johannisson, Ramirez-Pasíllas and Karlsson, 2002; Keeble and Wilkinson, 1999).

Spillovers of technical knowledge and skills, and hence the scope for the development of cluster capabilities, are increasingly well understood. Since technical knowledge often has a tacit component (Cowan and Foray, 2000), it typically spills over through face to face interaction and direct observation and imitation (Storper and Venables, 2004, Maskell and Malmberg, 1999), facilitated by supplier relationships (Visser, 1999) and collaboration between firms and local institutions such as universities (Dahl & Pedersen, 2004; Hervás-Oliver and Albors-Garrigos, 2007). The emergence of a flexible labor market with experienced freelancers and project labor may take decades of inter-firm mobility (Casper, 2007). Such labor mobility, particularly of knowledge workers, also make skills technical knowledge spill over between firms (Breschi and Lissoni, 2001). Furthermore, the general skill level in a cluster typically hinges upon investments in educational institutions and other labor market institutions, which typically takes joint action of local firms and policymakers (Breschi and Lissoni, 2001). Spillovers of cultural knowledge and the scope for development of cultural proximity in a cluster have been given less treatment in extant research. As cultural knowledge, for instance norms and beliefs, often is embodied in persons, it typically spills over through mobility of people, i.e. through job changes between firms or through employee spinoffs of new firms.

Extant IB literature examines how MNE subsidiaries engage and influence their local environment through frequent interactions with local suppliers, the use of common third-party suppliers, and inter-firm mobility of labor. Such interactions within the cluster all enhance the likeliness of local knowledge and skills spillovers from the subsidiary (Keeble and Wilkinson, 1999; Lawson, 1999), but are dependent upon the subsidiary's local engagement in the cluster

(Lorenzen and Mahnke, 2004). Investments in local training and education, and partnerships with local universities and other educational institutions, contribute to create knowledge jointly with other local actors. Arguably, firms with stronger capabilities have more to contribute but less to gain from involvement in the cluster, while the opposite is true for firms with weaker capabilities (Shaver and Flyer, 2007). Building upon the earlier discussion of the differences between MNE subsidiaries and local firms, arguably, the differences in pace and style of firm level capability development has implications for spillovers. MNE subsidiaries arguably have more sophisticated capabilities compared to local firms, who are attempting to catch-up; therefore, subsidiaries are in the position of contributing more to cluster capabilities than local service providers. However, despite possessing a comparatively lower level of capabilities, local firms have been known to play a significant role in shaping a cluster through entrepreneurial experimentation and inter-organizational learning (Athreye, 2005). Therefore, even though local firms possess weaker capabilities than MNE subsidiaries, their high engagement within the cluster and inter-organizational efforts mean that they may have significant spillovers to cluster capabilities.

Table 4-1 below sums up the extant arguments, core references, and remaining research gaps in IB literature regarding capability development and cultural distance.

Table 4-1 IB research on capability development and cultural distance

	MNE subsidiaries	Local firms	Research gaps
Capability development	Argued to develop strong capabilities through relationship with parent firms Bartlett and Ghoshal, 1989; Argote and Ingram, 2000; Kogut and Zander, 1992	Argued to develop weak capabilities and be subordinate in supplier relationships D'Agostino et al, 2012; Luo et al., 2012	Focus on end result, not process, of capability development Local firms' scope for capability development is largely ignored
Cultural distance	Argued that given high cultural distance, acquisition is most efficient entry mode Caves and Mehra, 1986; Dunning, 1993; Grant, 1996; Kogut and Singh, 1988; Slangen and Hennart, 2007	Argued to have modest capabilities compensating for cultural distance and hence target national markets with lowest cultural distance Ghamawat, 2001	Focus on entry mode overshadows research on other ways of compensating for cultural distance Brouthers and Brouthers, 2001; Shenkar, 2001 Local firms' capabilities of compensating for cultural distance is largely ignored
Cluster capabilities	Argued that MNE location influenced by attractiveness of clusters Lorenzen and Mahnke, 2004; Zaheer, 2009		No research on processes of developing cluster-level capabilities
Cluster cultural proximity			No research on development of cultural proximity Focus on only national level

In order to develop testable propositions addressing the theory gaps listed above, we now turn to evidence from the nascent DCI cluster in Bengaluru.

4.3 EMPIRICAL SETTING

The DCI sector

Our empirical setting is the digital creative industries (DCI): Animation, visual effects (VFX) and games. The sector is young: Digital games are half a century old, and digitalization of animation and VFX only gained speed since the 1990s. The DCI constitutes a fruitful setting because it is currently seeing new patterns of IB: DCI consumption as well as production originated in Western Europe, North America and Japan, but is spreading to new markets, coinciding with new patterns of outsourcing and MNE location.

At the heart of the DCI is digital animation. Animation is a century-old art form, and even with its current digitization (also called computer generation of images, CGI) and knowledge codification, it remains labor intensive and revolves around the creative (technical and aesthetic) skills of trained artists. Some DCI firms specialize in animation. While a few of these are producers (and IP holders) of end products the majority of specialized animation firms are sub-suppliers of content (jingles, ads, episodes, or segments) to the filmed entertainment, Internet, and advertising industries.

Since most clients outsource relatively large projects (for feature films or long-running TV-shows), and because modularity is low (the handover from one process to the next demands very intricate coordination), animation has notable scale economies. As a result, specialized animation firms often employ hundreds of artists organized in large teams. The capabilities of such firms hinge on being able to hire and organize animation artists, as well as instruct them to customize animated content to the exact quality levels and aesthetics expected by consumers or clients (Yoon and Malecki, 2010; Yoon, 2015).

The second main DCI, VFX, is more diversified, combining animation with matte (background) painting and digital effects with real photos or live action. VFX firms are suppliers to film and TV firms, and given the shorter duration of projects and lower scale economies in other processes than animation, VFX firms are typically organized in shorter projects and smaller teams compared to specialized animation firms, and the industry is more disintegrated.

Firms in the third segment, games, combine animation and other creative processes involved in game development (concepts, narratives, and designs) with technology-intensive processes (sequencing of games, the coding of engines and the technology aspect of user interfaces). Hence, while games firms need IP management as well as marketing and distribution prowess, their capabilities ultimately hinge upon their ability to combine creative skills with ICT skills, and typically also balance in-house production with the use of external suppliers of animation as well as coding and other ICT services, made possible by modularity in the development of games.

DCI production processes are highly labor intensive. Animation of content and production of VFX takes thousands of man hours, more for blockbuster films or long-running TV shows. While mobile and social games, popular on Asian markets, can developed in short projects, console games, dominant on Western and Japanese markets, are content-intensive and technologically advanced and hence, the cost of developing them sometimes match that of blockbuster films. Hence, to a great extent, early-mover DCI companies outsource the most labor-intensive processes, primarily to Asia. Early (2D) animation outsourcing focused on the Philippines, but CGI (including 3D animation) has brought about knowledge codification, facilitating finer slicing of value chains and allowing for entry of new firms. This has made

Taiwan, South Korea and India today's key outsourcing destinations (de Graf, 2004; Tschang and Goldstein, 2004).

DCI in India and Bengaluru

The Indian DCI sector is a late mover and is only 15 years old. However, it is rapidly growing. In 2011, it had an estimated size of 300 companies, 12,000 employees and a market value of USD 685 million (NASSCOM, 2015). Since then, annual growth rates have been as high as 20 percent, enabled by government training initiatives and incentives, co-production treaties, and new tax regulations (KPMG, 2013). The well-established Indian filmed entertainment industry contributes to driving particularly VFX industry growth, and a range of local firms as well as subsidiaries of major DCI MNEs are located in the filmed entertainment clusters in Mumbai, Hyderabad and Chennai. However, in parallel to other Indian industries (Lewin et al., 2009; Manning et al., 2008; Manning et al., 2010), foreign markets remain the major driver, and most Indian animation, VFX and games firms are suppliers at the lower end of global DCI value chains (KPMG,2013).

In Bengaluru, the south Indian city of 8.5 million inhabitants, digital industries and international business has been present for almost half a century. Since the 1980s, the city has developed into one of the world's largest ICT clusters, employing more than 150,000. With the global boom for ICT services (growing since the 1980s but booming with the millennium scare), the cluster attracted MNE subsidiaries on a large scale, subsequently grew local firms targeting international clients, and during the last two decades, the growth of a home market in India for ICT services has facilitated the emergence of very large local service providers such as Infosys and Wipro.

In comparison, the Bengaluru DCI cluster has emerged in the last ten years. With no notable local film, entertainment or advertising industry in Bengaluru, the DCI cluster focuses almost exclusively on supplying international clients, like the ICT cluster. Compared to the latter, it is much smaller with an estimated less than 100 active firms (aidb.com, accessed June 10, 2016). The nascent DCI cluster is in the process of developing its capabilities, and below, we outline how we designed our case study of that process.

4.4 STUDY DESIGN

An explorative case study

The purpose of our empirical study is to enrich theorizing in a field at an intermediate stage of development (Yin, 1984). A useful method for this purpose is an exploratory case study: Undertaking a rich description of a particular empirical case, using extant theory categories to make sense of data while acknowledging uncategorized themes and allowing new categories to emerge (Eisenhardt, 1989). Multiple comparative case studies hold the highest potential for generalization in the guise of theory of the necessary condition type (for example, that certain knowledge and skills always, given certain conditions, spill over from firms to clusters). A single case study is restricted to build theory of the sufficient condition type (for example, that certain knowledge and skills may spill over from firms to clusters) (Dul and Hak, 2008).

Due to resource constraints, we selected a single case study. We selected the DCI cluster in Bengaluru as our case purposively on the basis of extant theoretical categories of interest (George and Bennett, 2005), and because this case allows for collection of relevant empirical data that may enhance internal validity (Stake, 1995). Bengaluru is a latecomer to the DCI and currently in the process of developing its capabilities. Studying a cluster at such a nascent stage

makes is easier for us to discern relationships and causalities. Furthermore, Bengaluru is currently experiencing MNE entry, facilitating purposive sampling of interviewees and juxtaposing processes of capability development and spillovers of local firms as well as MNE subsidiaries.

Data collection and coding

We based our case study on extant secondary data combined with primary self-collected data. Access to informants in Bengaluru was difficult, and we used referrals from industry contacts obtained during earlier field work in Mumbai. Given our limited data access, we aimed to raise internal validity by purposive sampling (see below) and triangulating statements from informants with different positions and backgrounds, including several having worked in different Bengaluru firms and organizations. We halted our data collection after 19 interviews, when our sampling categories were covered and no further themes emerged from data coding (Guest et al., 2006). Given the explorative nature of the study, this was an acceptable level of data saturation, providing enough information to replicate the study in a future in-depth study (Gerring, 2007). Table 4-2 summarizes the three main segments in DCI and a breakdown of the local service providers and subsidiaries we interviewed.

Our data collection proceeded as follows. First, through library searches and through drawing upon DCI contacts obtained during earlier field work, we built two sets of secondary data on DCI in India and Bengaluru (listed as data sets 1 and 2 in Table 4-3 below). Next, we triangulated this with a set of primary data (data set 3): key informant interviews with industry observers, accessed partly through industry contacts, partly through cold calls. Two of these interviewees were also used at a later stage to discuss our data interpretations. Together, these sets of data pointed to rising DCI skills and the importance of a local DCI association in Bengaluru. Hence, in order to investigate these potential cluster capabilities, we then undertook

role informant interviews on site in Bengaluru with focal administrators and teachers (data set 4). We interviewed three different members of the executive committee of the local DCI association, in addition to two teachers, one central to the development of the association's activities, one responsible for the implementation of its educational initiatives.

Table 4-2 DCI Segments and Firms Sampled

Animation	**VFX**	**Games**
- Labor intensive - Long projects - Team driven - Low modularity - Entire projects are outsourced	- Combines animation with digital effects - Shorter projects - Smaller teams - Less specialized - Low modularity	- Combines animation with game development and coding - Use of external suppliers - High modularity
Local service providers		
Xentrix	Prime Focus	Dhruva Interactive
Subsidiaries		
Dreamworks Technicolor	Technicolor MPC	Technicolor, Rockstar, Zynga

Finally, to investigate firm-level processes and potential spillovers to the cluster, we built a set of primary data of role informant interviews with managers in DCI firms in Bengaluru (data set 5). To construct this data set, we sampled purposively. First, we applied theoretical sampling on our central theoretical category that we could observe *ex ante*: Ownership. We included the largest local firms as well as all MNE subsidiaries. Then, we applied empirical sampling on an important category suggested by our keynote interviews: Technology. We included firms from the all three DCIs of animation, VFX and games. In combination, these sampling principles yielded a data set with the three largest local firms, one in each industry segment, as well as all MNE subsidiaries, across all industry segments. To triangulate statements made by local firms, we used annual reports and online sources. Furthermore, we constructed a small data set of interviews with managers of two of their international clients, interviewed in Denmark (data set 6 in Table 4-3 below).

In our coding of data, we took departure in extant theory constructs with the aim of

allowing new empirical themes to arise, i.e. a structured middle position between open and theory-determined coding (Dey, 1993). After a first process of sorting data into empirical categories (technologies, products, markets, ownership), we aggregated data into interpretative categories (capabilities, cultural proximity, personal relationships, demand size, modularity). To enhance external validity (Numagami, 1998), we discussed our coding with several of our original interviewees, as well with industry observers in two additional interviews (data set 3).

Table 4-3 Data sources

	Data set	Method of building data set
1	Government reports on the Indian DCI industry	Secondary data. Full sample of all relevant reports published by CII; FICCI; IBEF; KPMG; PWC; and USIBC in the period 2005–2015. Summarized.
2	Newspaper articles and literature on Bangalore's development	Secondary data. Composite sample, by searching for newspaper articles and adding relevant journal articles and book publications.
3	Key informant interviews: Observers of the Bangalore DCI cluster	Primary data. 7 interviews with 6 informants. Purposive sample of observers with knowledge of the cluster's development: The former chairman of NASSCOM, the chairman of NASSCOM's Gaming Forum, a journalist, and a project broker. Open-ended, short unstructured protocol (Stake, 1995). Undertaken face-to-face in Bengaluru in 2015-2016, and on phone 2016. Lasted between 35 and 90 minutes. Taped and summarized.
4	Role informant interviews: Administrators, educators	Primary data. 3 interviews with 3 informants. Purposive sample of administrators and educators affiliated to ABAI. Semi-structured interview protocol. Undertaken face-to-face in Bengaluru in 2016. Lasted between 70 and 190 minutes. Taped and summarized.
5	Role informant interviews: DCI firms in Bengaluru	Primary data. 8 interviews with 7 informants. Purposive sample of Bengaluru's largest DCI firms, covering 3 local and 4 MNE subsidiaries. Replicated design, semi-structured interview protocol. Undertaken in 2016 face-to-face in Bengaluru (1 on phone). Lasted between 48 and 130 minutes. Taped and transcribed. Triangulated with annual reports, online sources, and cross-referencing information from informants who had worked in several of the sampled firms.
6	Role informant interviews: Client firms in Denmark	Primary data. 2 interviews with 2 informants. Convenience-based sample of firms that outsource DCI activities to Bengaluru firms in (5). Replicated design, semi-structured interview protocol. Undertaken in 2016 by phone. Lasted between 20 and 35 minutes. Taped and transcribed.

Note: Some interviews are listed in more than one category. The total number of interviews is 19.

4.5 FINDINGS

Cluster capabilities and cultural proximity

It was a shared opinion by all interviewees that Bengaluru is currently in the process of developing DCI cluster capabilities. Contrary to many investors' expectations, the DCI does not piggyback on the ICT cluster. As explained by one of the interviewed CEOs, a veteran in the cluster, entrepreneurs during the early years tried to project the nascent DCI cluster as Bengaluru's 'next big ICT miracle'. However, the fluctuating growth rates of the DCIs disappointed investors and the hiring of local ICT-trained staff proved unsuccessful. It turned out that, serving different client types and based on creative rather than ICT skills, DCI firms do not benefit from training or education investments sunk by ICT firms and policymakers. Furthermore, DCI firms have no scope for supplier relations to or from local ICT firms, even if they are all are all international service providers occupying the same Bengaluru technology parks and sometimes the same office blocks. Given such limited technology and skill spillovers from the extant ICT cluster, the current capability development of DCI cluster capabilities hinges on the activities of local DCI firms.

The first and fundamental capability is the increasing level of local *animation skills*. As pointed out by a local educator, technical skills among Bengaluru animators are in the process of being upgraded from low-end to encompassing mastery of state-of-the-art CGI and knowledge of the quality standards that apply on international markets. Another educator suggests that another important dimension of the current skill upgrade is *cultural proximity*: Bengaluru animators, who often come from a local arts or crafts background, are currently acquiring knowledge of aesthetics, customs and preferences at international markets. She exemplifies: *Bengaluru artists are learning to animate figures doing tasks with both hands, Western style*

(rather than avoiding the left hand, considered unclean in India) and paint mattes in colours acceptable to international audiences (rather than the tropical colours common in India).

There are two drivers of the rising level of animation skills. In the first ten years since the emergence of DCI activities in Bengaluru, the cluster's firms have undertaken substantial in-house training. In DCI clusters in Western Europe and North America, project-based freelancing is high, and even full-time employed animators tend to move between firms. Given the nascent nature of the Bengaluru cluster, there is a lack of experienced local animators and the scope for freelancing is low. Hence, most firms offer their employees long-term employment and invest in training them, incidentally for years. A second and more recent driver is a notable growth in the quality of animation courses. The first interviewed educator points out that while the Bengaluru region has a sizeable pool of creative talent with an arts and crafts background, the offer of animation courses (mostly from small, independent schools) has hitherto been insufficient. The second educator added that upon the advent of the DCI in Bengaluru, many local youngsters were lured into expensive but low-grade animation courses, spending their savings without obtaining job opportunities. Now, the course offer is being upgraded. Certifications are being promoted across local educational institutions, and a handful of larger colleges are modelling their curriculums on leading international animation schools, employing foreign faculty, and offering guest lecturers and workshops by top international animators. A new internship and placement program, in collaboration between colleges and local DCI firms, also aims at increasing the capacity of the educational offer.

Interviews with observers of the Bengaluru DCI cluster pointed to the pivotal role of the local non-profit *Association of Bangalore Animation Industry* (ABAI). Interviewing role informants at ABAI, we found that while the association's scope is to promote the DCI across

India, its impetus is local: From its initiation in 2006, ABAI succeeded in obtaining support and part funding from the local state government, inspiring the Karnataka Animation, Visual Effects, Gaming and Comics (KAVGC) policy. One leg of the KAVGC policy is education, funding for which can also be obtained under the National Skill Development Policy. Acting as a broker between local industry and such public funding opportunities, ABAI is hands-on involved in investing in the upgrade of the local animation courses and negotiating the internship and placement program.

A second activity of ABAI, also supported by the Karnataka government, is an annual combined festival and training event for the DCI, the KAVGC Summit/ABAI Fest. Held annually in Bengaluru since 2006, the Summit is India's prime industry convention for the DCI, attracting industrialists and investors from India and abroad, and is playing an increasing role for attracting international clients. The Fest targets animation students and offers screenings, master classes and panels with international animators and clients, and career and networking activities. As pointed out by all three interviewed members of ABAI's executive committee as well as several interviewed managers, the Summit and Fest are invaluable in exposing both local industrialists and talent to international clients, technologies, and quality standards. Bringing local labor up close and personal with foreign animators is, as expressed by one of the executive committee members of ABAI, the most effective way of developing cultural proximity.

The current third main activity of ABAI is lobbying for infrastructures facilitating DCI startups. In spite of revolving around skilled labor, the DCI incur substantial entry costs for entrepreneurs in terms of office space and ICT infrastructures. ABAI currently coordinates efforts of local firms in order to obtain government funding of a dedicated DCI incubator.

In the following, we turn to our sample of DCI firms, investigating their processes of developing capabilities and whether and how these contribute to the cluster capabilities and cultural proximity described above.

Capabilities and spillovers from local firms

We investigate local firms first, sampling the three largest. First, we interviewed the CEO and co-founder of *Xentrix Studios*, the largest local animation firm. Founded in 2010 and with 500 employees today, this privately held firm is one of the largest specialized animation suppliers in Asia. Supplying clients in the European and North American TV industry, the firm follows a scale-based scale model with single projects occupying up to a fifth of its staff at a given time, and with emphasis on retaining and renewing deals with its major clients.

Second, we interviewed the CEO and founder of *Dhruva Interactive*, the largest local games firm. Founded in 1997, it is India's oldest games developer and currently employs 300. Focusing on consoles games for a Western audience, the firm focuses entirely on supplying content for games producers of console games producers in Europe and North America.

Third, we interviewed the chief creative director and co-founder of *Prime Focus*, the world's largest independent provider of VFX and DCI technology services (digitization, conversion, and content management). Originated and headquartered in Mumbai, the firm has 5,500 employees and founded a Bengaluru branch in 2008. Employing around 1,000, this Bengaluru firm serves global clients across all DCIs with technology services combined with VFX and animation produced by branches in Mumbai and Hyderabad.

Comparing these local firms, we find a range of similarities in their processes of developing capabilities and how they spill over to the Bengaluru cluster. These arise mainly as a result of firms' ownership type and the high level of personal involvement of their CEOs. We also find important differences, arising mainly due to differences in technologies between the different DCI industries.

One similarity is that these local firms develop notable DCI *capabilities* through supplying international clients. One dimension pertains to scale and speed. The interviewee in the local animation firm explained how clients had pulled the firm into a steep learning curve of task pre-production planning and project management, necessary to retain large international clients (in his example, supplying animated content for TV shows with many episodes). The interviewee in the local games firm explained that due to the abundance of ICT-based tasks (such as coding) in games production, it is a huge advantage for a supplier to access an ongoing development project on the client's cloud server directly, interacting with the client's own developers in real time. From one of its major clients, the firm has now obtained permission for such access and is in the process of learning the necessary procedures and technologies. Another dimension of capability development pertains to quality. The animation firm experiences very strict quality control from its clients and has developed its own quality management procedures. In all three local firms, production quality is boosted not through just by clients' feedback to supplied work, but also through their personal visits to Bengaluru. In the local animation firm, personal visits happen regularly, sometimes monthly. We interviewed the CEO of the European client of the local animation firm and the creative director of the European client of the local VFX firm. They concurred that since Indian DCI suppliers are scale-intensive, clients need to

invest in coordination, mainly in the guise of frequent personal visits to Bengaluru, to ensure communication and consistent quality.

Another similarity is that *international personal relations* play a role for how the firms develop capabilities compensating for cultural distance. In all three firms, CEOs (the interviewees) have been trained and worked in Europe or North America. In particular for the local animation and games firms, personal relations of the CEOs to friends and family in these locations continue to play an important role for business. The interviewees leveraged such relations when obtaining their first international clients and founding their firms, and even if sales have since been professionalized in agents and foreign sales offices, international personal relations of sales personnel remain important for obtaining clients and getting contracts renewed. Interviewees in both these firms remain personally involved in the coordination of projects and in visits by clients in Bengaluru. The interviewee in the local games firm also explained that the firm's online access to the client's projects was only possible due to a high level of person-based trust. Furthermore, the interviewees explained that their experiences abroad, and the personal relations they still maintain in Europe and North America, provide them with knowledge of quality levels and cultural preferences on international markets for animation. They stressed the crucial importance of disseminating this cultural knowledge to their employees, many of whom had not travelled abroad. They both constantly explain their cultural reference points to employees, and the interviewee in the games firms also voices his personal feedback to content and inputs his knowledge to employee training.

In terms of *knowledge spillovers* to the Bengaluru cluster, there are notable differences between the firms. Using no local suppliers and with no employees spinning off to form own firms, the local animation and VFX firms have modest technological knowledge spillovers. By

contrast, the local games firm uses occasional local suppliers of particular services that can be separated from its main workflow. The reason was mentioned by the interviewees in both the local games firm and the MNE subsidiary games firm (see below): Compared to animation and VFX, games development has higher modularity due to its combination of animation-based and ICT-based processes. The local games firm has seen several employees spinning off forming their own local firms, and has created an incubator to stimulate the emergence of new DCI firms. While some of the incubated firms are suppliers to the local games firm, others have become independent local competitors.

Concerning *skill spillovers*, they are modest for all three firms. Due to the low level of experience on the local labor market for DCI, all our sampled local firms are weary of using freelancers, and focus on long-term employment and in-house training. For technology reasons, the local VXF and animation firms do not use freelancers at all, and the local games firm uses them only rarely. However, this firm arranges a training academy and tournaments for local talent, and since it does not hire all attendees, it has some local skill spillovers. For all three firms, labor turnover is low. However, it is noteworthy that the employees that do leave the three firms are routinely hired by the rapidly expanding DCI MNE subsidiaries in Bengaluru.)

Finally, there was a difference in the firms' *local participation* to the industry association ABAI. The reasons are partly to do with ownership, partly with technology: The VFX firm is a local branch of a Mumbai-based firm and has a distinct technology-based focus, whereas the local animation and games firms are headquartered in Bengaluru and more based in animation skills. Hence, the latter two firms are dedicated and active ABAI members. In particular, the interviewee in the local animation firm expresses his firm belief that ABAI's political lobbying, education activities and the ABAI Fest are central to the development of the

DCI cluster, and stresses his firm's dedication to participating to the internship and placement program developed by ABAI and local animation colleges.

Capabilities and spillovers from MNE subsidiaries

We now investigate MNE subsidiaries. Our sample contains all four currently having entered the Bengaluru DCI cluster. First, we interviewed the CEO and country head of *Technicolor India*, the Bengaluru subsidiary of the 100-year old MNE (current global employees: 15,000 including Bengaluru). Holding patents for many core technologies involved in filmmaking, Technicolor remains technology-focused, but after its acquisition by the French Thomson Group it has diversified into, amongst other activities, DCI services in terms of animation, VFX and games content. After building built a portfolio of large, mainly US, clients in the film, TV and games industries, Technicolor needed to expand capacity, and in 2010, it acquired the largest local Bengaluru animation studio (of then 1,000 employees). After the acquisition, Technicolor India increased its capacity and adjusted its target into offering content for games and VFX (including post production). Technicolor India's VFX activities are expanded particularly rapidly, under the banner Moving Picture Company (MPC), a Technicolor subsidiary and industry leader in supplying major blockbuster productions with effects and post production, and we also interviewed the general manager of *MPC Bangalore*. Together, MPC and the other Technicolor India activities (including the dedicated units, see below) employs 2,000.

Second, we interviewed the general manager of *DreamWorks Dedicated Unit*, the first large-scale foreign subsidiary of DreamWorks Animation (spun off from in 2004 from DreamWorks, the major US film production company, current global employees: 2,000

including Bengaluru). The unit focuses exclusively on supplying its parent with animated content, mostly for films. Currently employing 300, the unit entered in 2008 with a particular hybrid entry mode. While it operates like a DreamWorks subsidiary, it is legally owned by Technicolor India, who also takes care of the unit's legal and administrative obligations, such as employment contracts and interaction with local authorities. However, DreamWorks manages all tasks, owns all IP, designs the majority of procedures, and has imported much the unit's ICT infrastructure. This 'dedicated unit' entry mode, with rapid entry yet low commitment, has leveraged Technicolor India's existing animation workforce, and, through aggressive expansion and hiring of animators, allowed DreamWorks to upscale its Bengaluru operations fast.

Third, we interviewed an asset manager in *Rockstar Dedicated Unit,* the Bengaluru subsidiary of US Rockstar Games (established 1998, global employees: 1,200 including Bengaluru). This MNE also entered Bengaluru using the dedicated unit entry mode. Founded in 2012 and currently employing 250, the unit is also owned by Technicolor, taking care of its daily management and administration, but is fully integrated into Rockstar Games global value chain.

Finally, we interviewed the country manager of *Zynga India*, the fourth MNE having entered Bengaluru. Established in 2007, US-based Zynga was one of the fastest-growing games companies and in 2010, it expanded capacity dramatically with acquisitions and new plants, including a greenfield investment with 30 employees in Bengaluru, the first and largest of Zynga's foreign subsidiaries. Zynga India since expanded to 450 employees. Fluctuating demand in the games industry made Zynga reduce its operations (current employees: 1,500, down with 25% since 2013). However, given its high productivity and a growing Indian home market, Zynga India has had layoffs of less than 10%.

We identify a range of similarities in these MNE subsidiaries' development of capabilities and spillovers to the Bengaluru cluster, as well as differences arising mainly as result of disparate home market potential.

The most fundamental similarly is that MNE subsidiaries *develop capabilities* planned, at a large scale, and fast: Parent firms transfer staff, standard operating procedure, and entire ICT infrastructures and layouts, and run year-long, specialized training programs for local employees. For instance, Technicolor employs what it calls "artists" (animators) as well as "researchers" (developers, managers, and technology-focused skills), and the entire 350-strong group of the latter was transferred to the Bengaluru subsidiary from abroad. This process also develops capabilities compensating for cultural distance. Training is not merely technical, but also aims at making Bengaluru employees understand the needed quality and aesthetics in the content they produce for parent firms and their international clients. The international managers and creatives placed in Bengaluru (some on a project basis, some for extended periods) bring with them a high level of cultural knowledge, making the subsidiary able to plug into the MNE global value chain with few cultural glitches. The capability development of MNE subsidiaries is focused on a small part of the value chain: Three of the four MNE subsidiaries focus exclusively on animation, with parent firms undertaking pre-development, planning, design and coding activities. The MNE subsidiary specialized in games production is developing capabilities in comparatively more value chain activities. The parent firm serves the social gaming market, and since this type of games (played online and on mobile phones) can be developed in relatively short projects, the Bengaluru subsidiary undertakes not just animation, but also more ICT-based value chain activities. In addition, since a sizeable local market for social games is emerging in India (console games are comparatively expensive), the Bengaluru

subsidiary is now given the mandate by its parent to develop new prototypes of games targeting the local market.

In the development of capabilities, we noticed that the interviewees in MNE subsidiaries, by contrast to those in local firms, did not mention *international personal relationships* as valuable. Since the subsidiaries rely on their organizational connections to parent firms, the family and friendship relations of managers and employees are not leveraged for business purposes.

Concerning *knowledge spillovers*, the MNE subsidiaries' use of local suppliers is extremely limited. A central reason is the subsidiaries' tight integration into the global value chains of parent companies, based on daily communication and real-time online access. Combined with strict procedures of security (clients are the major global film and TV production companies, highly concerned with preventing piracy and hacking), this leaves little scope for outsourcing tasks to other Bengaluru firms.

Skill spillovers are also limited. One reason is that security procedures and focus on integration with parent firms' value chains mean that MNE subsidiaries prefer to hire on a permanent basis rather than using freelancers. Like the interviewees in local firms, our interviewees in MNE subsidiaries also mentioned that the local labor market is sufficiently developed to allow for freelancing. Another and more fundamental reason is that labor moves into, but not out of, the MNE subsidiaries. Due to the capacity needs of their parent firms, the subsidiaries expand by hiring new talent as well as trained labor from other Bengaluru firms. It remains disputed among local animators whether working conditions and pay of MNE subsidiaries are at par with local firms, but MNE employment is far more attractive in terms of training as well as internal career opportunities. Related to career aspirations, one of our

interviewees pointed out those international personal relations can be a disadvantage rather than a benefit to the MNE subsidiary, since relations to friends and family in the USA inspire employees to seek career opportunities in the MNE headquarters abroad after having been trained in Bengaluru subsidiary.

The aggressive hiring and internal training activities of MNE subsidiaries mean that their involvement in the improvement of local education institutions is less than suggested by the size of their labor force. Generally, MNE subsidiaries' *local participation* to the industry association is modest. Offering year-long in-house training programs at a scale and level far surpassing local firms, they have little need for participating to the internship program developed by ABAI and local education colleges, and do not offer their agreed number of placements in the program. The two MNEs having entered in the low-commitment 'dedicated unit' mode are fully focused on their parents' global value chains and have left all interaction with the local cluster, including ABAI, to their local host. The latter, the first DCI MNE to enter Bengaluru, was initially very committed to local participation, but since it has doubled in size and now manages operations and logistics dedicated unites of two other MNE subsidiaries, it has limited capacity to contribute to ABAI. A final point, raised by key informants, is that while MNE subsidiaries are enrolled in ABAI's efforts of creating an DCI incubator, their involvement also disincentivizes local entrepreneurs from participating, because they are weary of having business ideas appropriated by foreign-owned firms.

4.6 DISCUSSION AND PROPOSITIONS

Our sample of interviewed firms covers the core of a small and nascent cluster and represents firms across theoretical categories (local firms vs. MNE subsidiaries, covering the largest of both categories and all of the latter) and empirical categories (all the three DCI

industries). However, the sample is still small, biased toward the largest firms, and even if it is triangulated with a sample of administrators, educators and key informants as well as secondary sources, it only allows for explorative theory development in what follows: Discussing our findings, we offer propositions for future testing.

Capability development

Capability development of MNE subsidiaries is a known theme in IB, and our findings align with extant research: Through sophisticated and well developed mechanisms to transfer knowledge, facilitate learning, and transferring existing organizational practises, subsidiaries have access to their parent's organizational capabilities and repository of knowledge (Bartlett and Ghoshal, 1989; Birkinshaw, 1997; Kogut and Zander, 1996). Not unexpectedly, we find that MNE subsidiaries are faster than local firms in developing capabilities. In Bengaluru, MNE subsidiaries are solely reliant on their parents for this process: MNEs did not come to access cluster capabilities, which are still at a nascent stage, but to leverage low costs of Indian labor.

Local firms are less studied in IB, and our study heeds the call in IB literature of identifying the mechanisms of catch-up of latecomer firms. Extant IB research points to local firms as subordinate in supplier relationships. Since they perform narrow sets of value chain activities, they do not obtain architectural knowledge that can be essential in order to upgrade capabilities. As a result, their capabilities develop in delivering specific outputs and catching-up in terms of end-product delivery rather than in innovation (Awate, Larsen and Mudambi, 2012). However, our findings challenge this: Local Bengaluru firms develop notable capabilities through supplying international clients. Our studied firms interact repeatedly with core clients, and while that provides the impetus of technical upgrading, it also transfers knowledge of

planning and management processes. More importantly, we find that the capability development of local firms is not narrow compared with MNE subsidiaries. The latter are designed to undertake very specialized activities in their parents' global value chains. Since their parents expand their activities, the activity rate is high and projects run on short deadlines. Given the tight coordination with parent firms to avoid slack, there is little scope for subsidiaries to experiment with and develop capabilities in other processes. By contrast, local firms are also highly specialized to deliver particular services to their clients, but this specialization changes over time. New clients and markets exert a pull to gradually develop new capabilities. This leads to the following proposition.

Proposition 1: *A firm's capability development is influenced by the nature of its ownership because this affects knowledge transfer. Specifically, compared to a local firm, a MNE subsidiary is likely to develop technological competence more rapidly, but in a narrower set of value chain activities.*

We find a notable shift in the process of capability development of MNE subsidiaries, driven by from changing local needs (Luo and Park, 2001; Ghoshal and Nohria, 1993). All Bengaluru subsidiaries originally had the typical mandate of an offshore subsidiary, specializing in a narrow set of value chain activities. However, one subsidiary obtained competence-creating mandate from its parent because of a change of perception of local market opportunities. Currently, one more MNE is currently considering a similar mandate for its Bengaluru subsidiary, given the growth of the Indian market for animated films.

Proposition 2: *Local market size moderates the influence of firm ownership on capability development. Specifically, the greater the local demand, the more likely a MNE subsidiary is to get obtain a competence-creating mandate from its parent.*

Connectivity

Comparing the processes of capability development of MNE subsidiaries and local firms, we find a notable difference in their role of international connections. As mentioned, subsidiaries take advantage of MNE ownership. We find that in lieu of this opportunity, local firms take advantage of personal relationships to develop capabilities. Such relationships have arisen through managers' past experience of working in Europe and North America, and are carefully nurtured and supplemented as valuable resources, not just for obtaining contracts, but to deepen collaboration and transferring knowledge. The understanding of personal relations, including how they compare with connections in the guise of ownership, is a new research agenda in IB under the heading *connectivity* (Beaverstock et al, 2002; Lorenzen and Mudambi, 2013; Cano-Kollmann et al, 2016). This research agenda compares different types of international connections between firms and clusters and investigates how the nature of these connections affects MNE strategy as well as, in turn, the connected clusters. It points to personal relations, in the guise of managers' and employees' family and friendship ties, as complementary to MNE ownership. Due to their (relative) autonomy from business strategy, personal relations between firms are vehicles for knowledge transfer and trust. This has the potential to spill over to business. For instance, IB research has documented that MNE investments across clusters often follow pre-existing personal relations (Qiu, 2005; Zaheer et al., 2009) The importance of personal relations has grown tremendously during the last decades, given developments in communication and transportation technologies (e.g. email, social media, and cheap airfares)(Agrawal, Cockburn and McHale, 2006). Furthermore, these technological developments also mean that personal relations between clusters can be reinvigorated even after years of being dormant (Lewin et al., 2011). In a description perfectly fitting the managers of the

Bengaluru local firms, Saxenian (2006) describes how specialized migrant labor is today's 'global Argonauts', developing personal relationships between the locations they have lived and worked, resulting in international business opportunities.

Focused on the innovation impact of international connections, Lorenzen and Mudambi (2013) suggest that since organization-based connections are strategic and align with business firms' relatively short-term profit focus; they facilitate focused search and innovation with a narrow scope. By contrast, since personal relations are emergent and have many potential objectives, they provide the impetus for more diverse search and broader innovation. This comparison offers a potential explanation for our finding that while Bengaluru local firms develop capabilities more slowly than MNE subsidiaries, they search broader and seek wider opportunities, and have the scope for developing more diverse capabilities.

Proposition 3: *A firm's capability development is influenced by the nature of its global connections because these have different modes of transferring knowledge. Specifically, while a MNE subsidiary is likely to rely on an organizational connection, a local firm is likely to use personal relations.*

Spillovers from firms to clusters

The literature on clusters illustrates that through local embeddedness firms may benefit from, and in turn contribute to, cluster capabilities. Through using local freelancers and spilling trained workers over to other firms, firms add to local levels of skill and experience (Marshall, 1920). Furthermore, through local formal and informal connections to other firms and organizations, firms participate to a broad range knowledge spillovers (Hervás-Oliver and Albors-Garrigos, 2007; Johanisson et al., 2002). Even if not focusing specifically on clusters,

the IB literature on subsidiary mandate aligns with these observations in prescribing MNE subsidiaries' local embeddedness. Since relationships with local managers and governmental authorities (Xin & Pearce, 1996) and connections with local suppliers, distributors, buyers and competitors facilitate local responsiveness (Luo, 2001); firms that are active in their local environment will benefit more from local factor endowments. Local participation is seen as a source of new knowledge and one of the mechanisms through which subsidiaries upgrade their capabilities, and eventually, position within MNEs (Andersson, Forsgren and Holm, 2002; Birkinshaw, 1997).

However, our findings challenge these observations. We do not find evidence of MNE subsidiary embeddedness in the Bengaluru cluster: Compared to local firms, they use fewer local suppliers and have a significantly lower level of participation with the local industry association. This finding is consistent with Shaver and Flyer's (2000) argument firms with comparatively strong internal capabilities benefit less from external (cluster) capabilities. In Bengaluru, local firms benefit from cluster capabilities and consequently engage in developing them. By contrast, MNEs entered the cluster for wage arbitrage, and potentially to gain first-mover advantages in accessing the rapidly expanding Indian animation market in the future. They are likely to bide their time until the DCI cluster develops stronger capabilities to consider participating more locally. The hybrid entry mode we identified, that of 'dedicated units' is an illustration of the current low level of embeddedness by two MNE subsidiaries. Leaving all administration, legal work and hiring to the local host, this entry mode is designed to build scale fast with a low level of local participation.

Proposition 4: *Spillovers from firms to cluster capabilities are influenced by the nature of firm ownership because this affects incentives to become locally embedded. Specifically, compared to*

a local firm, a MNE subsidiary is less likely to use local suppliers and freelancers and participate to the development of local supporting institutions such as industry associations.

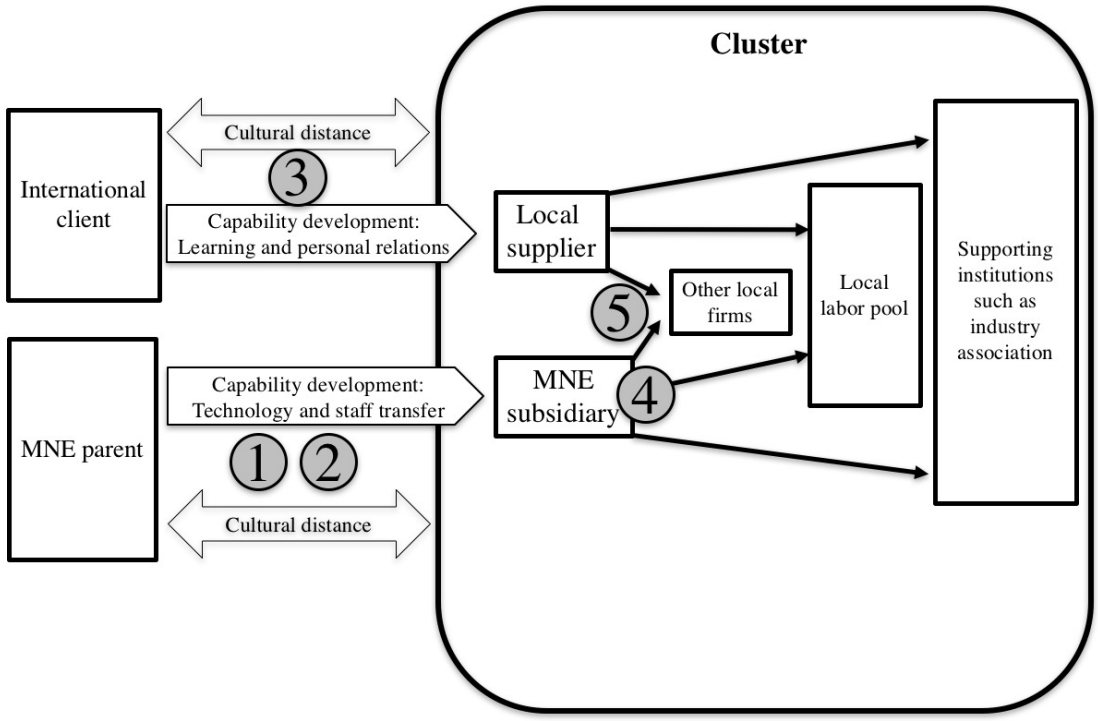
Our findings point to a moderating role of technology. Games firms, both local and MNE subsidiaries, use more local suppliers, more freelancers, and see more employees spinning off new firms than firms specializing in animation and VFX. The reason is that there is a greater diversity of both animation and ICT-related tasks in the gaming segment of the DCIs. This finding connects to literature on modularity, arguing that the greater the decomposability of value chain activities (component standardization, interface specification), the higher the scope for outsourcing (Sanchez and Mahoney, 1996). In the IB literature on the implications of value chain disaggregation for offshoring, this argument is echoed in the observation that highly modular interfaces are easy to outsource due to lower uncertainty (Mikkola, 2003; Sako, 2006). Hence, ceteris paribus, the higher the modularity of firm-level processes, the greater their potential for spillovers to cluster capabilities. When a MNE or international client offshores processes with high modularity to a firm in a cluster, this firm may outsource further to local suppliers, disseminating knowledge and impetus for capability development locally. Furthermore, it creates incentives for its employees to becoming local suppliers by spinning off their own firms. Further tiers of local outsourcing entails increasingly specialized tasks and less scope for capability development. However, local outsourcing is a seedbed for the development of new firms, who might, in time, step up to directly supply international clients and embark on a process of broader capability development.

Proposition 5: *Technology moderates the influence of firm ownership on spillovers from firms to cluster capabilities. More specifically, the higher the task modularity in an industry, the more*

likely a firm operating in this industry is to use local suppliers and freelancers and spin off new firms.

Figure 4-1 below sums up the discussion, with our propositions illustrated with numbers 1-5.

Figure 4-1 Summary of the argument



4.7 CONCLUSIONS AND IMPLICATIONS

The paper investigated the development of capabilities of MNE subsidiaries vs. local firms, and how it may spill over to the development of capabilities, including cultural proximity, at the cluster level. From an IB perspective, it is interesting for MNE strategy to know more about MNE presence in a cluster relates to local competition, how it may in turn influence the further development of the cluster capabilities that first attracted it, and how this may change its

reasons for staying. From a policymaker perspective, it is highly relevant to know more about how different types of firms contribute to local development, and how the capabilities represented by MNE subsidiaries can be embedded in a cluster, so technologies and skills do not vanish if the MNEs relocate.

Given the early presence of both strong local firms and MNE subsidiaries, these questions are highly pertinent for the DCI cluster in Bengaluru. Our study suggests that for the early process of developing cluster capabilities, attracting MNE investment is not necessarily a silver bullet. We discuss the challenge of incentivizing MNE subsidiaries to participate in the development of the local labor pool and local supporting organizations, as well as the importance of local demand size and technology modularity for MNE's incentives for local participation. Our study also points to the notable potential of local firms for contributing to cluster capabilities, as well as the role of international personal connections plays for this process. Public policies that promote international connectedness, such as fairs, conferences, and student exchanges, are already being explored in Bengaluru to positive effect. Furthermore, while there are limited spillovers of technology and skills from the well-established Bengaluru ICT cluster to the nascent DCI cluster, the former cluster has greatly boosted Bangalore's global connectedness. Whether and how the fact that Bengaluru is one of India's most globally connected cities spills over to the DCI cluster is an interesting question for future research.

The Bengaluru DCI cluster is still modest in size and in an early stage of development. Our study, the first of this cluster, is itself small and exploratory. However, offering new evidence of a pertinent phenomenon, the study allows for developing propositions that complement extant IB theory. It is our hope that these propositions might lend themselves to future empirical testing.

Chapter 5: Conclusion

Guided by the research question – *what drives or impedes capability development in an offshoring context*– this thesis investigates the process through which capability development takes place at varying levels of analysis. Whether firms develop their capabilities in response to a change in mandate or to fulfil strategic objectives, this thesis argues that capability development is a path dependent process, requiring deliberate actions and trial and error in order to develop capabilities. Unless the organizational processes and sub-processes can be understood, the goal of capability development can be elusive to reach.

The thesis consists of three research papers using various datasets and qualitative methods that investigate the different aspects of capability development in an offshore context. The first paper (Chapter 2) argues that service provider firms who primarily perform outsourced activities engage in capability development through interactions with their clients. Activities carried out by the service provider firms can be classified by degree of interdependence - either sequential interdependence or reciprocal interdependence. The production of these two types of services leads to the development of human capital, organizational and managerial capital. However, it is argued that neither of the two activities leads to the development of all three capabilities, which has strategic implications for the service provider i.e. the service provider, must select clients that support the development of capabilities considered necessary by the service provider. This paper positions the service provider firm to be the central player contrary to previous studies which posit the service provider to be the subordinate in the client-service provider relationship.

The second paper (Chapter 3) examines how the process of capability development unfolds as a consequence of relocating R&D activities to a captive offshore unit performing

standardized activities. There are three salient phases in order for the captive unit to develop learning and integrative capabilities. The development of these capabilities allows the captive unit to begin performing R&D related tasks with measurable success. Performing R&D activities reduces the autonomy of the captive unit and increases their dependence on the home unit. This in turn leads to a change of routines and reallocation of resources within the offshore unit and leads to resistance to developing capabilities and performing R&D activities. This unexpected resistance by the captive unit adds to the understanding of subsidiary evolution, and mandates – if a change in mandate increases the dependence on the home unit and loss of autonomy for the offshore unit, it will be met with some degree of resistance. Three mechanisms are identified as assisting in the capability development of the offshore unit – informal training and mentoring, restructuring within the offshore unit and collaboration with the external network. In addition to the offshore unit, the home unit also needs to develop structural and interface management capabilities in order to adapt with the transition of relocating R&D.

The final paper (Chapter 4) examines how firm level processes spill over to the cluster level, and lead to the capability development of the cluster, thus expanding the understanding of how clusters emerge and evolve. Contrasting between the development of MNE subsidiaries and local firms (often fulfilling the role of service providers) leads to the identification of differences in capability development for these two types of firms. It is argued that though subsidiaries have a higher level of capabilities through linkages with the parent MNE, they have fewer spill overs in the cluster due to their limited involvement in the cluster. The local firms lag behind the subsidiaries in their level of expertise and as a result perform tasks that can be modularized; this allows them to utilize local players to perform the simpler aspects of the overall project. It is argued that cultural proximity at the cluster level can be

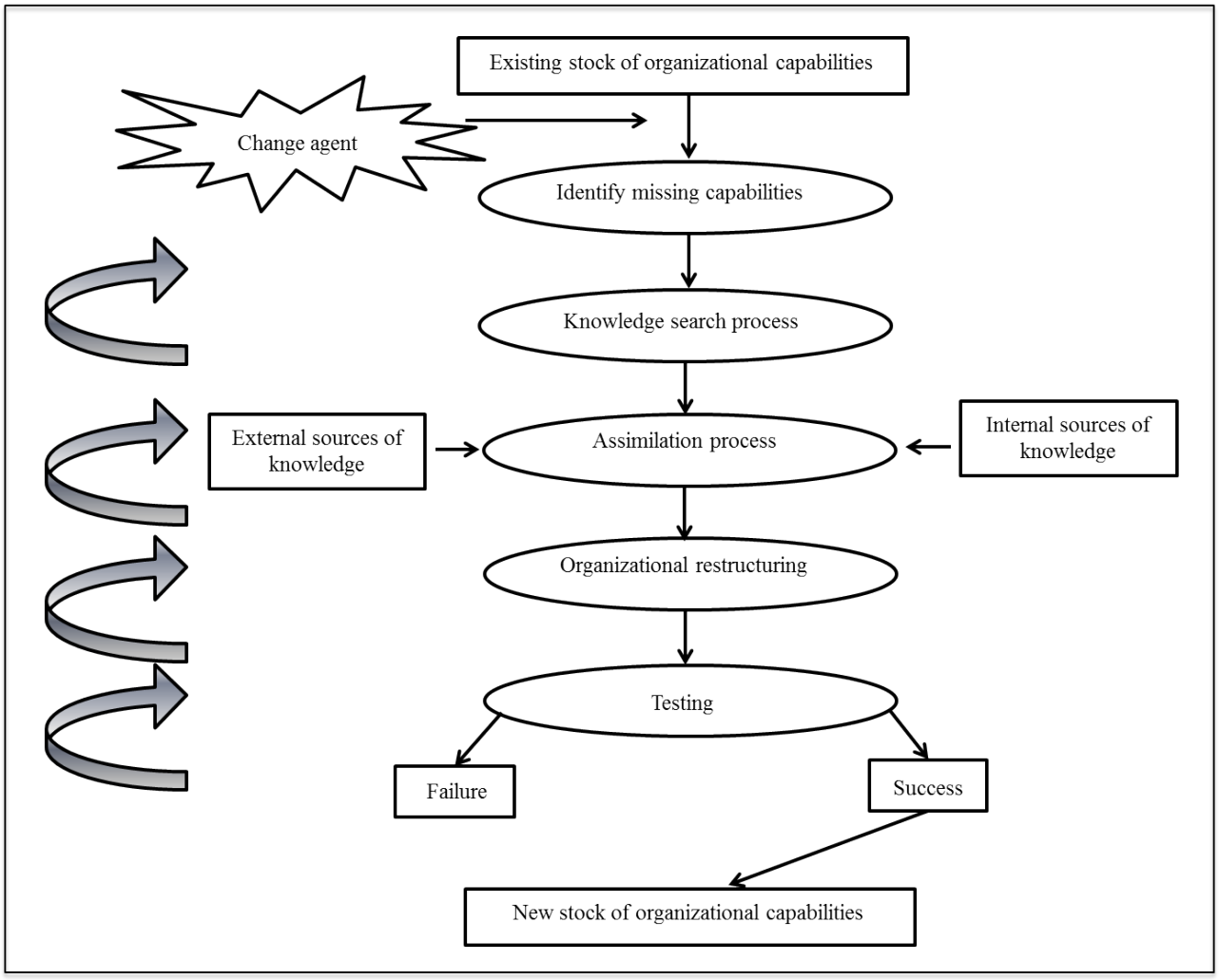
created through transfers of personnel and cultural knowledge from the parent MNE and connectivity with clients in international markets.

Taken together these three papers present an interesting challenge to understanding the process of capability development: *the drivers and impediments of capability development vary at different levels of analysis*. Therefore, capability development is not simply a matter of implementation, but also understanding the building blocks of capability development, and the contribution of different organizational processes. The dislocation and relocation of activities creates interdependencies between the home unit and offshore unit, capability development necessitates changes in these interdependencies, which in turn negatively impacts the status quo between the home and offshore units (Chapter 3). However, the captive offshore units, as compared to local service providers can benefit from linkages with the parent MNE (Chapter 4). While the service provider firms need to utilize their connections with the client firms in order to develop their capabilities (Chapter 2). The ability of subsidiaries to rapidly develop capabilities through the parent MNE can have positive implications for the service provider firms within a cluster (Chapter 4). Thus, in order to understand how the capability development process unfolds, these papers emphasise that the paths of learning, linkages outside the firm and interdependencies within the firm, presents a firms with a set of choices that when accompanied with deliberate steps towards capability development, leads to a measurable improvement in the firm's capability stock.

Based on the findings presented in this thesis, I offer a model of capability development (Figure 5-1). Several aspects of the model are impacted and challenged by the offshoring context, specifically identification of missing capabilities, the search process and restructuring. A key difference in the capability development process between captive

offshoring and offshore outsourcing is that the offshore unit and home unit need to aligned to ensure successful capability development. While in the case of local service providers, their response to the change agent, identification of missing capabilities and the knowledge search process takes place without the interaction of the client firms. Both the offshore unit and local service providers have the opportunity to acquire and assimilate knowledge from internal sources of knowledge, such as employees, the company's headquarters, other subsidiaries or the MNC's network, and from external sources, such as the client firm, suppliers, vendors or the cluster. Though is it likely that the type of transfers between home-offshore unit, and client-service provider will differ. Therefore, it is essential for the service provider firms to have a targeted search process to develop deliberate capabilities.

Figure 5-1 Capability Development Model



5.1 Contributions and implications

The findings presented in this thesis contain a number of theoretical contributions with implications for our current understanding of capability development and future research. Specifically, this thesis contributes to the literature by 1) examining capability development in an offshoring context; 2) identifying the different paths to capability development and at varying levels of analysis and 3) presenting a theoretical model of the capability development process.

First, studying capability development in an offshoring context suggests that this context presents certain idiosyncrasies that have implications for capability development. In this thesis I highlight the differences in capability development between captive units and service providers. Significant research has focused on performance outcomes (Mol, Van Tulder, and Beiji, 2005; Nieto and Rodriguez, 2011); however, less attention has been paid to the internal processes such as capability development, which also differ between the two governance modes. By focusing on the service-provider perspective, service providers' motivations and the relevant mechanisms of capability development, I address the research gap regarding the strategic behaviour of service-provider firms (Luo et al., 2012) and identify the steps service-provider firms take to further their strategic goals. Second, captive units are either viewed in the literature through a static lens – either as the back-office or the R&D centre of the firm (Jensen and Pedersen, 2011). By highlighting the transition and evolution of the captive unit, I aim to present a more realistic trajectory that is indicative of firms' learning paths and their experiences in offshoring. I highlight the differences between captive units and service providers located within the same cluster. Though much has been written about the rapid rise of firms from emerging markets, especially India (Athreye, 2005; Lewin et al., 2009), I find that service-providers need to enhance the knowledge repositories and capability stock found within their organizations. This supports extant findings that although firms from emerging economies are competing with MNCs, they still need to catch-up from a capability and technology standpoint (Awate et al., 2012). Finally, I add to the sparse stream of literature that adopts a process perspective and examines the dynamic nature of capability development during the relocation process. Extending the findings of Maskell et al. (2007), Manning et al. (2012) and Jensen (2009), I show that firms can gain capabilities through the disintegration and relocation process thereby increasing the competitiveness of the firm and fulfilling strategic objectives. Future studies

could adopt a longitudinal perspective, and establish typologies of capability development paths and identify specific capabilities developed through these processes. Additionally, quantitative studies could also study the efficacy of specific capabilities in an offshoring context.

Second, by identifying the different paths to capability development, I position capability development to be a path dependent process. Limited research has attempted to understand where capabilities come from (Ethiraj et al., 2005) and the underlying mechanisms supporting the development of these capabilities (Montealegre, 2002; Parida et al., 2013). I find that in the offshoring context, the offshore unit is limited by their previous role, which most often involves performing standardized activities. These units often possess a piecemeal understanding, specific to their tasks; while capability development requires trial and error experimentation, integrating resources among activities (Amit and Schoemaker, 1993; Montealegre, 2002), learning (Zollo and Winter, 2002), and the assimilation and exploitation of knowledge (Cohen and Levinthal, 1990). Therefore, offshore units are inevitably bound by their past experiences and previous role within the organization. Identification of capability development paths wields predictive power in explaining how future capability development is influenced by past roles. Organizations can therefore factor the future consequences of disintegration and relocation during the decision making process to ensure alignment between current and future strategic objectives. Though efforts have been made to understand the implications of past experiences and the history of a firm, this study is limited by its small sample size to predict the importance of historical events. Therefore, future studies can study the strength of path dependence in the capability development process, and identify factors that enable organizations to grow beyond the limitations presented by past experience.

I also address the calls for examining capability development beyond the organizational level of analysis (Foss, 1997; Un and Montoro-Sanchez, 2010). By examining capability development at the activity level, unit level and at the firm and cluster level, I have identified different salient mechanisms and the different capabilities developed at each level. The interplay between type of activity carried out and the resultant capabilities developed shows a clear path dependence relationship not just at the organizational level, but also at the activity level. Chapter 2 and 3 highlight that type of activities performed as part of organizational routines impact the capabilities developed at an organizational level. Furthermore, the interplay of firm and cluster level capabilities sheds light on the emergence of clusters and their evolution. This has implications for location selection strategy and also the catching-up processes of local firms. Future research can attempt to examine the link between the activity characteristics and pace of catching-up.

As identified in the introduction, the term 'capabilities' are used inter-changeably with knowledge, resources and even skills (Barney, 1991). In this thesis I have taken steps to theoretically delineate capabilities from other constructs, and capability development from other organizational processes. I define capability development as a *deliberate firm-level investment involving a search and learning process aimed at modifying or enhancing existing capabilities.* Through the case studies used in this thesis and their analysis, I show that capability development comprises of a number of sub-processes such as learning, knowledge search, trial and error, and modification of routines, among others. Capability development incorporates recognized processes such as learning and transferring knowledge but extends beyond them. The purpose of this thesis is to address the call for understanding how capabilities are developed (Eisenhardt and Martin, 2000; Winter, 2003; Zollo and Winter, 2002) and shed light on the

processes and sub-processes of capability development. It is my ambition that through this thesis I clarify the understanding and portrayal of capability development as deliberate *patterns of action and the combination of assets with routines and organizational processes (i.e., operational capabilities).* Each paper in this thesis has identified specific capabilities that have evolved or developed as a consequence of deliberate actions to develop capabilities. The overall picture of capability development cannot be drawn however; the study of replication and creation processes within an organization present a good starting point to extend our understanding of capability development.

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Appendix A

Table 1-A

Position of Interviewee	Number of Interviews	Location	Date
Head of engineering*	3	Denmark	November-December 2012; April 2013; May 2013
Head of procurement	2	Denmark	November-December 2012; April, 2013
Product manager fabric filters	4	Denmark & India	March 2013, April 2013, September, 2013; October, 2013
Product manager ESP	2	Denmark & India	March, 2013; May, 2013
Product manager systems design	3	Denmark & India	March 2013, May 2013, September, 2013
Head of Biztec India*	3	India	September, 2013; October, 2013
Head of engineering	2	India	September, 2013
Team lead ESP	1	India	September, 2013
Team ESP	1	India	September, 2013
Team Lead fabric filters	1	India	September, 2013
Team lead fabric filters	1	India	September, 2013
Structural support manager	1	India	September, 2013
Product manager fabric filters	2	India	September, 2013
Product manager ESP	1	India	September, 2013
Product manager systems design	1	India	September, 2013
Team member FF	1	India	September, 2013
Team member FF	1	India	September, 2013
Team member ESP	1	India	September, 2013
Team member structural	1	India	September, 2013
Team member systems design	1	India	September, 2013
Product manager small dust filters	1	India	September, 2013
Development team member	2	India	September, 2013
Development team member	1	India	September, 2013
Development team member	1	India	September, 2013

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