Bridging what we know:

Mol, Machiel; Brandl, Kristin

DOI:
10.1016/j.ibusrev.2017.11.003

Document Version
Peer reviewed version

Citation for published version (Harvard):
Mol, M & Brandl, K 2017, 'Bridging what we know: The effect of cognitive distance on knowledge-intensive business services produced offshore', *International Business Review*.
https://doi.org/10.1016/j.ibusrev.2017.11.003

BRIDGING WHAT WE KNOW: THE EFFECT OF COGNITIVE DISTANCE ON THE PRODUCTION OF KNOWLEDGE-INTENSIVE BUSINESS SERVICES

Michael J. Mol[a*] & Kristin Brandl[b],

[a]Copenhagen Business School, Department of Strategic Management and Globalization, Kilevej 14A, 2000 Frederiksberg, Denmark, mmo.smg@cbs.dk

&

Birmingham Business School, University of Birmingham

[b]University of Victoria, Peter B. Gustavson School of Business, PO Box 1700 STN CSC, Victoria BC, V8W 2Y2, Canada, kbrandl@uvic.ca

* Corresponding author. Earlier versions of this paper were presented during mini-conferences at the University of Reading and Copenhagen Business School and the annual meetings of the Academy of Management and Academy of International Business. The authors acknowledge helpful discussions with and comments from Peter Ørberg Jensen, Bent Petersen and Steve Tallman.

BRIDGING WHAT WE KNOW: THE EFFECT OF COGNITIVE DISTANCE ON KNOWLEDGE-INTENSIVE BUSINESS SERVICES PRODUCED OFFSHORE

ABSTRACT

The rise of offshoring of knowledge-intensive business services (KIBS), causing a physical separation between clients and service providers in co-created services, is a major trend in practice but challenges existing theories. International business literature has addressed many types of distance that may affect (service) offshoring, such as cultural or geographic distance. However, limited emphasis has been placed on the implications of differing cognitions of individuals that produce a *cognitive distance* (CD). We address this gap and ask how increased CD through offshoring affects KIBS production processes. This conceptual paper focuses on how CD interacts with the modularity of different process stages in service production and what effect CD has on repeated production processes. In order to do so we first predict what stages of KIBS production processes can be offshored and what implications offshoring has on these services. We contribute to literature by deepening the understanding of CD and providing a process perspective on KIBS offshoring that looks at modularity within services, rather than firms as bundles of modular production, and on the impact repeated production processes have on service characteristics.

Keywords: Cognitive distance; knowledge-intensive business services; offshoring; service modularity

1. INTRODUCTION

Knowledge-intensive business services are a major and increasing contributor to economic activity, particularly in advanced economies, and have therefore been studied widely in recent decades (e.g. Kipping & Kirkpatrick, 2013; Murray, Kotabe & Westjohn, 2009; Starbuck, 1992). For example, it has been conservatively estimated that these services made up 5.3% of U.S. economic activity in 2012 (US Census Bureau, 2013). We define knowledge-intensive business services (KIBS) as "value added activities [that] consist of the accumulation, creation, or dissemination of knowledge for the purpose of developing a customized service […] to satisfy the client's needs" (Bettencourt, Ostrom, Brown, & Roundtree, 2002: 100-101), i.e. services that are co-produced by knowledgeable experts of service providers and clients (Starbuck, 1992; Schein, 1990) due to their embeddedness in the client's context. Thus, KIBS have various characteristics that distinguish them from less knowledge-intensive services and manufacturing (Murray et al, 2009).

Undoubtedly the most important change affecting KIBS over the past decade has been the previously unimaginable rise in offshoring of KIBS (Larsen, 2016; Metters & Verma; 2008; Mudambi & Tallman, 2010), such as the offshoring of legal services (Harmon, 2008), research and development (Bertrand & Mol, 2013), and financial services (Jensen, 2011). Offshoring is viewed here as the sourcing of activities, either within a firm (captive) or from an outsider firm (outsourcing), from another geographic location, to support a firm's domestic or global operations (Manning, Massini and Lewin, 2008). This geographic relocation of services can be seen as a drastic case of decoupling the service production process, i.e. separating services production and consumption, which should significantly affect these services and their characteristics. Decisions to source services across country borders are often driven by the dual aims of capitalizing on cost advantages, similar to manufacturing, but also and maybe even more importantly by the desire to access skilled and knowledgeable labor (Manning et al., 2008; Maskell, Pedersen, Petersen, & Dick-Nielsen, 2007), which in turn increases the capacity to create new knowledge.

Thus, offshoring and perhaps any physical separation of production and consumption of high value activities, challenges traditional theories of international business (IB), which have assumed that

high value activities ought to be undertaken at home or are only offshored for efficiency seeking purposes (e.g., Dunning, 1993).

Moreover, IB theory has paid much attention to the impact of distance on cross-border activities, but the types of distance discussed most commonly, such as cultural distance (see Kogut & Singh, 1988 and in a service context Peeters, Dehon, & Garcia-Prieto, 2015), or geographic distance, do not directly address knowledge creation. Even knowledge distance is a type of distance most commonly measured through patents (Berry, Guillen, & Zhou, 2010), i.e. it addresses knowledge outputs, not inputs. A small literature (e.g., Bertrand & Mol, 2013; Ceci & Prencipe, 2013; Fainshmidt, White, Cangioni, 2014; Xu & Shenkar, 2002) has used another type of distance called cognitive distance (CD). As we explain in more detail below, CD focuses on knowledge creation at an individual level, which stands in contrast to cultural distance that remains on the collective level. This characteristic makes CD highly relevant for our study of KIBS, as services are dependent on knowledgeable individuals (Starbuck, 1992), and are co-produced by individuals of the client and service provider (Schein, 1990).

Specifically, we draw from cognitive and behavioral theory, which focuses on how individuals create knowledge (Gavetti, Greve, Levinthal, & Ocasio, 2012; Levinthal, 2011; Nooteboom, 2009) and propose that offshoring induces an increase in CD among the individuals producing knowledge. Our focus is predominantly on trying to understand KIBS, not on the firms producing and / or consuming these services, and we compare offshoring to the default option of domestic (onshore) production. We focus on location as the driver of distance, only briefly addressing questions of ownership (outsourcing), which literature has already tackled (e.g., Bals, Jensen, Larsen, & Pedersen, 2013; Jahns, Hartmann & Bals, 2006; Murray & Kotabe, 1999).

Therefore, the central objective of this paper is to explain what CD is and investigate how various stages of a KIBS production process are more or less likely to be offshored (in propositions 1a-e below). Then we study the indirect impact of CD on the modularity of different production stages (propositions 2a and b) and the repetition of service production processes (proposition 3). We argue that a) stages of production processes differ in their likelihood of offshoring due to CD; b) where

production processes are modular, CD encourages offshoring of production stages; c) repetition of a production process in an offshoring relationship can help to bridge CD between individuals.

Our research produces two main contributions that provide insights going beyond existing theory. First, we present CD as a separate form of distance, at the level of individuals, which is crucial in KIBS contexts that involve co-production of knowledge by the client and service provider. CD has potential implications for a wider variety of IB phenomena. We show how CD changes the production process of services and as a result also service characteristics. These insights are novel to the international service management literature. Second, we help progress theory in offshoring and global operations management by providing a process view of KIBS production, which examines modularity of service production and repeated interactions between service providers and users while taking a cognition perspective. This approach creates a detailed picture of the phenomenon and provides stronger theoretical underpinnings.

Next, we discuss KIBS and the concept of CD, to lay out the mechanism driving our later analysis. Then we dissect the KIBS production process into five stages, to allow us to discuss each of these stages and the impact of CD on the propensity of offshoring this stage. Then, we are able to study the interrelationship between the stages within the production process and the repetition of the process. The key contribution of the paper comes from propositions that use the CD mechanism to investigate two key aspects of KIBS production processes, namely modularity and repeated relationships (McDermott, Mudambi, & Parente, 2014; Miozzo & Grimshaw, 2005; Tiwana, 2008). Finally, we develop the implications of our work and conclude the paper.

2. KIBS AND COGNITION

2.1 Characteristics of knowledge-intensive business services

There has been some work describing the design and characteristics of KIBS as well as their production process (Den Hertog, 2000), although research efforts have mainly focused on the design of services in general (c.f. Goldstein, Johnson, Duffy & Rao, 2002). Goldstein et al. (2002) emphasize

the service concept in the production and design of services and produce a service design-planning model with three consecutive stages including inputs and outputs. Den Hertog (2000) emphasizes service innovations and client interaction, service delivery and technological dimensions of services design. However, this work does not incorporate the idea that a service production process consists of multiple stages (Stabell & Fjeldstad, 1998), nor does it examine physical separation of clients and providers as evident in KIBS offshoring. A further point from IB studies is that use of KIBS is associated with export intensive firms, although this seems to be driven by the innovativeness of these firms than by their export behavior as such (Shearmura, Doloreux, & Laperrièred, 2015).

Before discussing the production process of KIBS further, the unique characteristics of the services need to be understood as they play a major role in the process. KIBS are often deeply embedded in client contexts through organizational processes and are used for the production of value, which is not always easy to decipher (Bowman & Swart, 2007) but is primarily derived from the creation of new knowledge. This knowledge is co-produced by experts from the client and service provider (Schein, 1990) and involves a high degree of tacitness, which is difficult to transfer effectively across locations and organizations (Szulanski, 1996). We follow Grant (1996) in arguing that knowledge is primarily an individual-level attribute, due to their strong reliance on these individual experts (Bowman & Swart, 2007). Moreover, the tightness of the link and co-production intensity can vary between different services (Bettencourt et al., 2002). There can even be variation between different stages of the production process of a single service; KIBS consist of multiple stages that are required to turn an initial customer signal into a finalized service (Stabell & Fjeldstad, 1998).

As a result of KIBS characteristics, the services are socially constructed, context specific, and ambiguous, based on personal judgments. These characteristics, taken together with the difficulties of standardizing activities that arise from the need for service customization (Løwendahl, 1997; Bettencourt et al, 2002), imply that KIBS offshoring was long seen as impossible (Stabell & Fjeldstad, 1998). Moreover, traditional IB theories have also predicted difficulties in offshoring of knowledge-intensive activities, due to the specific assets of KIBS that are impossible or costly to transfer across borders (Buckley & Casson, 1976) and that KIBS were argued to relate to client core

competencies (Prahalad & Hamel, 1990). However, recent practical developments have severely put this conclusion into question.

We see KIBS offshoring as an ideal setting for understanding why these traditional theories no longer seem to provide correct predictions and suggest that the study of CD between individuals is the best place to start theorizing about new mechanisms. A summary of several existing perspectives on offshoring can be found in table 1. We suggest that as firms increasingly consider different production stages separately (as modules), it has become possible to offshore some of these modules while retaining others onshore, instead of keeping everything onshore. This choice is evidenced by the observed increases in offshoring. Furthermore, we believe that experience generated from repeated interactions between providers and clients may be helpful, as it potentially bridges CD and supports firms' offshoring activities.

INSERT TABLE I ABOUT HERE

2.2 Cognitive distance

Given that knowledge production in KIBS is dependent on individual experts and occurs as a direct consequence of people's cognitions, we adopt a cognitive perspective. This cognitive perspective builds on recent theoretical developments in behavioral theory (e.g. March, 2006). Work on CD (e.g. Nooteboom, 2009) stresses diversity in the cognitions of senders and recipients, which can be a source of value according to research in economics (Nelson & Winter, 1982) and organizational psychology (Van Knippenberg & Schippers, 2007). However, differences may also be problematic if they cannot be bridged sufficiently, for example, when individuals in an organization cannot recognize the value of new, external information and assimilate it, i.e. when there is a lack of capacity to absorb new knowledge (Cohen & Levinthal, 1990).

Additionally, research by Levinthal (2011) discusses the complementarity of cognitive (behavioral) theories, vis-à-vis the more established 'economizing' (Williamson, 1991; 1999) approach of transaction cost economics and the resource-based view that is 'principally concerned with efficiency theories' (Williamson, 1991: 75). Gavetti et al. (2012), Bertrand and Mol (2013) as well as Ceci and Prencipe (2013) extend the cognitive perspective into the offshoring context. CD means that "*people will perceive, interpret, understand and evaluate the world differently to the extent that they have constructed their cognition along different, weakly connected life paths*" (Nooteboom, 2009: 66-67). *Ceteris paribus* this means that the average CD between individuals from different countries will be greater than that within countries, since life paths will be more weakly connected. Although prior IB research has used the concept of CD (e.g. Fainshmidt et al, 2014; Xu & Shenkar, 2002), this work simply defines it as 'distance in the cognitive pillar' of Scott's (1995) work on institutional theory. By contrast our approach of CD starts at the level of the individual and builds directly upon behavioral theory.

Thus, we put individuals and their interaction at the center of attention, analogous to Coleman's "bathtub" concept (Coleman, 1990) used in the literature on micro-foundations (Felin and Foss, 2005). The bathtub is a visual representation of a model that describes how social facts (institutions), labeled as "A" in the bathtub model, lead to social level outcomes ("D"). More specifically, Coleman (1990) argues that these social conditions ("A") produce conditions for individual action ("B"). The conditions then shape the actions of individuals ("C"), which eventually aggregate into social level outcomes ("D"). In other words, the concept provides a mechanism to explain the role of individuals in producing outcomes at the social level, such as in organizations, rather than going directly from social level conditions to social level outcomes.

To clients and providers of KIBS, the decision to offshore an activity is usually an exogenously imposed change that affects the work they do. More particularly, offshoring implies that clients and providers are based in different locations, and as noted, average CD between individuals from different countries will be greater than that within countries. Thus, similar to the Coleman bathtub, we see offshoring as a social circumstance (the A) that imposes certain conditions on

individuals from the client and service provider side, such as a larger CD (B), which enable and constrain their actions (C). These individual actions in turn produce social outcomes (D), in this case the service. In other words, in line with the bathtub concept, there is a process from social antecedents through individual conditions and actions to social outcomes that results in the multiple levels of analysis. The focus on individuals and their CD is novel to international service management and service offshoring literatures (Jensen, 2011).

However, this positioning also leads to the question how CD differs from cultural distance. We suggest there are two key differentiators. First, CD is an individual level construct, describing cognitive differences between two individuals, while cultural distance is by definition a collective trait, describing differences between two groups (Caprar, Devinney, Kirkman, & Caligiuri, 2015). Since the focus of this paper is on knowledge created at the individual level (Grant, 1995), it is more appropriate to use CD rather than cultural distance. Second, while CD focuses on knowledge production (Nooteboom, 2009), which is directly relevant for KIBS, cultural distance is applied to broad behaviors (Kogut & Singh, 1988). Of course, we acknowledge there are some connections between the concepts. For example, if two individuals are part of the same culture, in Nooteboom's (2009) terms their life paths become more strongly connected, and their CD should be smaller, all else being equal.

3. OFFSHORED KIBS PRODUCTION AND COGNITIVE DISTANCE

Cognition theory argues that an organization is seen as a cognitive focusing device (Nooteboom, 2009; Kaplan 2011), which somewhat limits CD within the organization. Likewise, CD within a country is small, due to shared institutions and a shared culture, in comparison to the CD between countries. The larger the CD in offshored activities, the more benefits for value creation purposes, as it allows for recombination of heterogeneous knowledge inputs (Bertrand & Mol, 2013; Rodan & Galunic, 2004).

However, IB research has shown that cross-national distance often produces positive and negative effects simultaneously (Reus & Lamont, 2009). The more KIBS production gets offshored and the more distant the sources are, the more heterogeneous knowledge will be. Yet, the marginal returns of adding further heterogeneity will decrease, simply because as the stock of heterogeneity of knowledge in an activity goes up, any knowledge encountered from further sources is less likely to be novel. More importantly, any knowledge recipient has a limited capacity to absorb new knowledge and additional heterogeneity may have a negative effect (Cohen & Levinthal, 1990). Thus, the relationship between CD and knowledge creation is negative curvilinear, as also supported in a large sample of technology alliances by Nooteboom, Van Haverbeke, Duysters, Gilsing, and Van den Oord (2007) and in samples of R&D agreements in the pharmaceutical and ICT industries by Wuyts, Colombo, Dutta, and Nooteboom (2005). Furthermore, it is known to take time to bring together such heterogeneous knowledge (Van Knippenberg & Schippers, 2007). In contrast to the work of Nooteboom et al. (2007) and Wuyts et al. (2005), our focus is explicitly on the cross-national component of CD and on knowledge creation in KIBS. In conclusion, we can draw two lessons from this discussion. First, in theory, decision-makers can choose 'cognitively optimal' offshoring levels for KIBS production stages. Second, in reality, they often end up with a less than optimal or more than optimal CD. To study the cognitively optimal offshoring level, we unpack the KIBS production process into its underlying production stages. We do so by drawing from the work of Stabell and Fjeldstad (1998) who suggest that there are five such stages:

- "*Problem-finding and acquisition*. Activities associated with recording, reviewing, and formulating of the problem to be solved and choosing the overall approach to solving the problem" (Stabell & Fjeldstad, 1998: 423-424, emphasis added).

- *"Problem-solving*. Activities associated with generating and evaluating alternative solutions" (Stabell & Fjeldstad, 1998: 423-424, emphasis added).

- *"Choice.* Activities associated with choosing among alternative problem solutions" (Stabell & Fjeldstad, 1998: 423-424, emphasis added).

- *"Execution*. Activities associated with communicating, organizing, and implementing the chosen solution" (Stabell & Fjeldstad, 1998: 423-424, emphasis added).

- *"Monitoring and evaluation*. Activities associated with measuring and evaluating to what extent implementation has solved the initial problem statement" (Stabell & Fjeldstad, 1998: 423-424, emphasis added).

Stabell & Fjeldstad (1998) argue that the stages are reciprocal and interdependent and that KIBS production normally consists of both a hierarchy and a sequence. The hierarchy implies that there is some overall service that can only be delivered through various smaller services, each of these being stages in the production process. Moreover, the process is cyclical meaning that one production process can lead to a new production process. Within service (operations) management literature, similar service production models with production stages are discussed and applied (see for example Aarikka-Stenroos & Jaakkola, 2012 or Maister, 2012). Moreover, Stabell and Fjeldstad's (1998) model has been applied in various contexts, including knowledge intensive business services (e.g. Brandl, 2017).

3.1 CD in production process stages

We are now in a position to start offering novel insights on offshoring of KIBS[1] and investigate the impact of CD on their production process. We acknowledge differing degrees of complexity of offshoring arrangements, and the fact that offshoring can take place in nearby and far-away destinations (where 'near' and 'far' refer to how distant individuals, on the client and provider side, are from each other). Given co-production, there is a question what it means for an activity to be offshored. We consider this to be the case if the ownership of a stage lies with the offshore provider, even if the onshore client makes a significant contribution.

[1] Stabell and Fjeldstad (1998) use the term value shop to refer to the combined stages in any KIBS production. They (1998: 421) maintain that value shops cannot be offshored as organizations "often both improve performance and reduce costs by incorporating the object worked on." This was perhaps a reasonable argument at the time of writing, however, empirical reality has changed and many offshored activities are ostensibly KIBS. We will, however, demonstrate below that parts of KIBS are still difficult to offshore.

As discussed above, the problem finding stage is highly uncertain, context dependent and important to the entire production process because the cyclical process format implies that subsequent stages will be influenced by previous decisions and activities (Mintzberg, Raisinghani, & Théorêt, 1976). This requires extensive organizational knowledge and a direct connection to the project (Lewin et al., 2009). A distribution of information across country borders will likely fail due to difficulties in transferring the vast amount of tacit knowledge in the stage (Szulanski, 1996) and, once experts become removed from the origin of the problem, they find it (increasingly) difficult to produce the service. This combination also implies that an offshore location is not able to provide valuable insights on the finding and acquisition of the problem. For example, in Brandl (2017) the KIBS production process of a marketing intelligence service outlines the activities of the client and service provider in the stage. In this stage, the client identifies the need for information, a report, or update of an operations model. The service provider simultaneously tries to understand these requests, but is restricted with the contribution it can make. Consequently, CD could hinder the service production process, as the sense-making of participants is too diverse and potentially too disconnected from the service. CD is not beneficial for the service production and offshoring of this stage will have a negative impact.

The second stage of problem solving, by contrast, involves more analytical work (Stabell & Fjeldstad, 1998). There is significant involvement of professionals in the stage, but as the nature of the problem is now known, the codification of this knowledge into a set of problem responses can be developed in a relatively straightforward manner (Laundry et al., 2001). Managerial attention is shifted towards the acquisition and allocation of appropriate resources, a task where the onshore client firm does not necessarily hold production cost advantages over the offshore provider (Maskell et al., 2007). In the example above, the client explains the model and shares knowledge on possible locations of information. The service provider establishes how the models are updated and where required information can be found (Brandl, 2017). Thus, the potential benefits of increased CD associated with problem solving are vast, as solutions have been framed and can be understood fairly easily (Stabell & Fjeldstad, 1998). CD between individuals in onshore and offshore locations have the potential to benefit the production of services as more knowledge can be created, in view of the

inverted U-shape of knowledge creation from CD. As a consequence, there are high benefits from offshoring this stage, primarily taking the form of novel knowledge production.

The third stage, choice, requires high-level involvement in designing the service, an activity that is less labor- and time-intensive (Stabell & Fjeldstad, 1998). This stage determines consecutive stages and outcomes in a path dependent manner (Sydow, Schreyögg & Koch, 2009), since an execution method is chosen. In the market intelligence service example, the client decides what information should be used, while the service provider acknowledges the choice made by the client (Brandl, 2017). Consequently, CD between a client and an offshore provider should be relatively low for choice of activities, since the client context is important and the service provider will lack knowledge, information and influence in contributing to this choice. CD negatively impacts this stage and offshoring presents a risky choice due to the importance of the stage for overall outcomes.

The fourth and largest stage of a production process will often be its actual execution, taking both most of the time and human resources (Stabell & Fjeldstad, 1998). The implementation of processes strongly depends on middle managers and frontline employees (Hutzschenreuter & Kleindienst, 2006). Since this is a highly labor intensive stage, it provides the greatest potential for production cost savings (Lewin et al, 2009) and value creation through new knowledge (Brandl, 2017), which as we suggested in the introduction are key drivers for offshoring decisions. In fact, we would go so far as to suggest that when people discuss offshoring of KIBS, they most often refer to offshoring of the execution process, rather than offshoring of the entire production process; this suggests that in a colloquial sense the different stages are often not distinguished clearly enough, a point we will discuss in more detail below in the ‘modularity of production process stages’ section.

This argument is also supported when looking at the example of the market intelligence service we used in the discussion so far. The client is sharing information and data for the model or report if they have valuable knowledge on the market, while the service provider generates models or writes reports. The models/reports are then exchanged for a contractual agreed sum (Brandl, 2017). When drawing on our CD argument, as the execution stage is very labor intensive and ‘large’, this stage allows many opportunities to recombine the heterogeneous knowledge inputs that come with CD and

to create value through new knowledge. Such benefits will outweigh the hidden, transaction costs that offshoring also entails and we therefore expect to see relatively more offshoring of this stage. The increasing presence of professionals in far-off locations (Manning et al., 2008) provides some indicative evidence for this argument.

Finally, the fifth stage of monitoring and evaluation is an activity that normally requires involvement of high-level decision-makers and uses only a limited amount of labor (Stabell & Fjeldstad, 1998). The monitoring and evaluation stage measures the extent to which implementation has contributed to problem solving and involves further analysis to possibly initiate another production process. Based on the possibility of continuing a process, "outputs" of one process cycle can become inputs for another, the sequencing referred to earlier (Langley, 2007; Stabell & Fjeldstad, 1998). In the example, while the client integrates the model or report information, the service provider requests feedback from the client on the service quality and potential further services (Brandl, 2017). Thus, CD can help or hinder the production process of the services. However, this stage is predominantly dependent on the client firm and the implications of the activities on the firm rather than a focus on the service provider. The impact is based on both firms' organizational set up and relationship. Consequently, potential benefits from offshoring the stage are moderate. In conclusion, depending on the different activities within a production process stage and interaction between the client and the service provider, CD impacts the likelihood that different production stages are offshored. Table 2 summarizes the above arguments and resulting conclusions. They can also be stated as propositions concerning the likelihood of offshoring, relative to other stages, following the bathtub logic, i.e. if a high CD between individuals (B) leads to difficulties in achieving individual level knowledge creation (C) in the different production stages, the service outcome (D) is negatively impacted which is expected to lower the likelihood of offshoring (actual A):

> *Proposition 1a: CD is expected to challenge production in the problem finding and acquisition stage and thus, there is a low probability this stage is offshored, all else being equal.*

Proposition 1b: CD is not expected to challenge production in the problem solving stage and thus, there is a high probability this stage is offshored, all else being equal.

Proposition 1c: CD is expected to challenge production in the choice stage and thus, there is a low probability this stage is offshored, all else being equal.

Proposition 1d: CD is not expected to challenge production in the execution stage and thus, there is a high probability this stage is offshored, all else being equal.

Proposition 1e: CD is expected to moderately challenge production in the monitoring and evaluation stage and thus, there is a low to moderate probability this stage is offshored, all else being equal.

INSERT TABLE II ABOUT HERE

3.2 Modularity of production process stages

Although the above analysis of individual stages generates useful insights, we noted earlier that reciprocity between stages and the lack of perfect modularity (McDermott et al, 2014; Simon, 2002) is a key characteristic of KIBS production. A lack of perfect modularity makes it more difficult to offshore separate production stages. Thus, in order to truly understand the impact of CD on the service production process, we also need to consider the impact of CD on the interaction between the different production stages.

Theoretical support for such an analysis can be found in literature around service modularity (e.g. Simon, 1962; Langlois, 2002; Voss & Hsuan, 2009). KIBS modularity refers to the extent to which production stages can be undertaken on a stand-alone basis, without requiring inputs from other stages, i.e. the more reciprocity, the less modularity. As suggested by Simon (2002: 589), who frames

the modularity issue as decomposability, near decomposability occurs when interactions within a stage are more meaningful than those between stages. If, on the other hand, activities within a stage strongly depend on the input of and interaction with prior stages, leading to a high connectivity of stages, low modularity is evident.

Literature on service architecture and modularity also considers the degree to which components can be separated and recombined (Voss & Hsuan, 2009). The extent of modularity depends on both engineering / design of the process and strategic concerns related to the production of the services, which vary greatly across industries (McDermott et al., 2014). It is argued that modularity simplifies design and production processes and offers the potential for a greater division of labour within stages (Campagnolo & Camuffo, 2010). Hence, literature on the modularity of manufacturing production networks (e.g., Brusoni, 2005) and services (Voss & Hsuan, 2009) find that the more modular a production process, the easier it is to take separate governance decisions for each module (see also McDermott et al., 2014).

We further expect variance in modularity between different KIBS to depend on the service design and strategic intention of the services, but also on the organizational and environmental context. Some of this variance depends on the increasing CD in the context of offshoring and requires adjustments in the design of the offshored services. For instance, Brandl, Mol, and Petersen (2017) show through several case studies that the way a KIBS is produced, based on the service system (task resources, task execution and task output), changes as a consequence of offshoring. The authors study, for example, an intellectual property and R&D research service and find that task resources and their formal education, training, and business expertise changes from the pre-offshoring to the post-offshoring phase. While the expertise of the executing employees is high in the pre-offshoring phase, the level of expertise significantly decreases in the transition phase until it is restored to higher levels in the post-offshoring phase. Similarly, in the task execution process the service becomes standardized and more coordinated and the value of the service becomes high again in the post-offshoring phase. Thus, the service system needs to re-balance task resources, execution and output due to offshoring, which consequently impacts the way the service is produced (Brandl et al., 2017). Hence, we propose

that CD not only impacts the probability of offshoring of individual stages, but equally the production process as a whole.

Thereby, we consider modularity as a mechanism that enhances or diminishes the impact of CD on the production process. More specific, if modularity is low the various stages have to be tightly coupled. This tight connection in combination with the earlier argued negative impact of CD could have negative consequences for the production process, as tight coupling benefits from a strong and shared understanding of tasks (Thompson, 1967). Building on this argument, we suggest that there are two important consequences of low modularity. First, if modularity is low, decision-makers cannot easily offshore individual production stages and will be reluctant to offshore an entire production process because doing so would significantly increase problems of knowledge transfer. In other words, if some stages are particularly hard to offshore due to CD and there is simultaneously low modularity, we expect then that onshore production to remain the default option for the entire KIBS. We suggest this is consistent with Stabell and Fjeldstad's original (1998) observation that KIBS cannot be offshored, as in their work they appear to assume that high modularity is not possible for KIBS.

A second and related consequence is that if modularity is low decisions on whether to offshore a given stage will need to depend more heavily on decisions made for previous stages to maintain the integrity of a production process. In other words, we suggest that if earlier stages are being offshored, this makes it more likely that later stages will be offshored too. This insight builds directly on our earlier observation of path dependence between stages (Sydow et al, 2009).

> *Proposition 2a: The less modular a production process (the harder it is to separate the respective stages), the less likely stages of a production process are to be offshored due to cognitive distance.*

> *Proposition 2b: The less modular a production process (the harder it is to separate the respective stages), the more likely it is that decisions on whether to offshore one particular*

stage coincide with decisions concerning other, particularly earlier, stages, due to cognitive distance.

3.3 Repetition of production processes

All of the above discussion took a rather static perspective, because we assumed the CD between two individuals to be given, which may be realistic at first contact. However, we must also take into account whether and how CD can change in an offshoring relationship because a) individuals of the provider and client typically interact over a longer period of time and b) the assumption that CD is fixed over time is highly simplistic. Changes in CD can appear if the distance between individuals reduces as their life paths come together, for example through repeated interactions and learning (Nooteboom, 2009). Therefore, we now analyze the impact of repetition on production processes. Repetition leads to individual and organizational learning and either enhances absorptive capacity or reduces costs (Nooteboom, 2009).

For the service provider, the ability to value, assimilate and apply knowledge gained can lead to innovative activities and to the transfer of best practices (Szulanski, 1996) that can be reapplied in other settings. Similarly, the client learns how to better use knowledge, which improves its relationship with the provider, particularly through enhanced partnership management and interorganizational trust (Lane, Lubatkin, & Lyles, 2001). Information asymmetries between individuals of the client and service provider decrease through multiple iterations, as does the amount of information that needs to be exchanged prior to offshoring of new services. Jensen (2009) illustrates this point with examples of organizational learning in an offshored KIBS context, studying among other services an offshored engineering service and finds that there are strategic and systemic learning effects for the client and service provider firm. The client firm learns to interact internationally, which enhances the firm's internationalization activities and how trust related to offshoring activities is gained (strategic learning). It also capitalizes on changed project implementation models as well as streamlined, standardized and enhanced international experiences

(systemic learning). On the other hand, the service provider is able to gain confidence in own offerings and how to operate internationally, especially in Europe (strategic learning), and changes its systems, such as recruitment, training, project planning and implementation (systemic learning) to fit its offerings (ibid.).

We do not dwell on the reasons why clients may decide to repeat production with the same provider, however, prior success is clearly one likely driver of such decisions, although less 'benign' motives such as organizational inertia (Mol & Kotabe, 2011) or personal preferences may also play a role. The literature has presented a strong case that repeated cooperation leads to the development of relationship-specific assets, knowledge-sharing routines, complementary resources and capabilities, and more effective governance through trust between individuals and organizations (Dyer & Singh, 1998; Gulati, 1995). Much of this argument rests on the notion of routines (Nelson & Winter, 1982), and in the case of offshoring this involves developing new routines for people in geographically remote locations to collaborate, which can be challenging (Lewin et al, 2009).

The effect of these repeated interactions on outcomes is paradoxical. On the one hand, those same knowledge-sharing routines and strong ties (Hansen, 1999) facilitate more effective sharing of knowledge between individuals. But, on the other hand, the effect of repeated cooperation is also to bring parties closer together, i.e., to bridge the CD between them (Wuyts et al, 2007). This closeness implies that apparent heterogeneity in knowledge resources in the relationship decreases, i.e. there will be fewer possible novel combinations of knowledge inputs as combinations start to get exhausted. Furthermore, repetition of production leads to routinization and standardization of knowledge sharing in the relationship and of the productive activity itself. In other words, the knowledge intensity of the production process decreases.

Prior commoditization of activities is precisely a key driver of the offshoring phenomenon (Lewin et al., 2009), yet over time commoditization is equally a product of offshoring. The effect of repetition therefore depends on which of these competing developments—better knowledge sharing through routines or less novelty due to bridging of CD—occurs faster. Behavioral and cognitive work has explained in detail how underperformance, in the form of misalignment, produces additional

effort to try and bridge the performance gap (Greve, 2003). We would therefore also expect that there is some kind of natural rebalancing, where clients and providers increase the pace of building interorganizational routines when the KIBS underperforms. Again, using the bathtub logic, we propose that there is an effect from the imposition of the social fact of repeated relationships (A) on CD at the individual level (B) and as a consequence on the interactions of the individuals (C) and service outcomes (D) as follows:

> *Proposition 3: Repetition of KIBS production processes in an offshoring relationship can bridge cognitive distance between individuals on the client and provider side, leading to fewer constraints in interactions.*

4. DISCUSSION AND CONCLUSION

4.1 Contributions

Our paper enriches work on offshoring and global operations and is among the first to focus on the offshoring process (cf. Jensen, 2011; Luo, Wang, Zheng, & Jayaraman, 2012). We provide a more detailed picture of service design than evident in existing literature (e.g., Goldstein et al, 2002). We argue that KIBS consist of multiple stages that are more or less modular. Building upon this, our paper confirms the notion that the production of KIBS may become even more modular (Voss & Hsuan, 2009), with some stages conducted onshore and others offshore (Lewin et al, 2009). Rather than thinking about such modularity along the lines of functional areas as is normally done in IB literature (Luo et al., 2012; Mudambi, 2008), we proceed to a more advanced level of aggregation by separating activities into stages and arguing that the notion of modularity applies to the services themselves.

Furthermore, we provide a distinct conceptual mechanism to KIBS and IB literatures, which argue that the physical separation of individuals of client and service provider organizations creates CD, which impacts upon service production processes. We particularly suggest that: a) stages of production processes differ in their likelihood of offshoring due to CD; b) where production processes

are modular, CD encourages offshoring of production stages; c) repetition of a production process in an offshoring relationship can help to bridge CD between individuals.

We believe these conclusions hold important implications for the IB literature and for practice. First, in line with prior IB research (e.g., Fainshmidt et al, 2014; Xu & Shenkar, 2002) we use the concept of CD given its applicability in knowledge intensive contexts. Contrary to existing work in IB, however, our interpretation of CD is driven by a behavioral perspective, stemming from individual cognitions, instead of an institutional perspective. This interpretation of cognition and of CD can be applied in other areas of IB as well, for instance to assess whether different cognitive frameworks lead to different market entry modes or to see whether cognitive differences drive the success of expatriation assignments.

This paper also offers practical implications for those involved in managing high value activities. We maintain that there are opportunities to benefit from CD, which exists between individuals, and by extension organizations, located onshore and offshore. In other words, offshoring of KIBS can be used not just to lower costs but also to harness the knowledge creating potential that may exist when cognitively distant individuals produce knowledge inputs that can be (re)combined in novel ways (Bertrand & Mol, 2013). This implies that distance is not just a problem for managers, but also an opportunity (Reus & Lamont, 2009). We further highlight that decision-makers ought to carefully analyze different production stages, the modularity of a KIBS, prior client and provider experience, and the effect of repeated production in an offshoring relationship.

4.2 Boundary conditions and conclusion

There are further considerations that affect the analysis of offshoring of KIBS. First, we note that there is great heterogeneity in the composition of production processes. For instance, some services, such as clinical trials in pharmaceuticals, will have a very large execution stage, making them more suitable for offshoring (Contractor et al. 2010). Other services, particularly those at the beginning of a sequence of production processes, may not proceed beyond the problem finding and acquisition stage

(Stabell & Fjeldstad, 1998), meaning they are less likely to be offshored. Our framework is agnostic as to the precise nature of an individual production process, but actual decision-making must reflect such heterogeneity.

Furthermore, KIBS production processes are likely to involve significant learning, discovery, and experimentation. While we highlight how learning takes place in repeated production processes, individuals and firms also accumulate knowledge across different, completely unrelated, production processes (Grant, 1996). Individual cognitions are by definition limited due to bounded rationality (Simon, 1982), and experiments with offshoring may be determined by 'socializing' as much as economizing (Mol & Kotabe, 2011). This suggests that perfect alignment is a feature of academic models more than of empirical reality and that decision-makers only act in case of serious misalignment due to limited managerial attention, which is what the behavioral perspective predicts (Gavetti et al., 2012).

Of course, offshoring is not the only means through which CD emerges; for instance, at the cross-national level we note that inpatriation (Harvey, Speier, & Novicevic, 1999), the hiring of foreigners into a country, is an alternative mechanism to create CD, at least temporarily. It is likely that in many instances the majority of the CD between individuals does not come from their nationalities or where they happen to reside, but from factors such as their level of education, disciplinary background, age, gender, and so on.

In addition, activities may have recently been transferred from one location to another, were transferred some time ago, or started in the offshore location, which are all transfer processes that are well understood in the information systems literature. For example, Leonardi and Bailey (2008) contend that new work practices may have to be invented by client and supplier to effectively transfer implicit knowledge. The state of a transfer process has significant implications for the production of knowledge in offshored KIBS (Brandl et al., 2017). An ineffective transfer process, i.e. when the client's (knowledge) assets are not transferred across to the provider as needed, undermines benefits of CD.

While the current paper is conceptual, there is an underlying empirical research agenda. It may prove difficult to empirically separate production stages in large samples due to limited modularity. So, the most obvious way to study the impact of physical separation on the KIBS production process is to undertake multiple in-depth case studies. Such studies would work best if they contain before / after comparisons that capture the activity over a significant period of time and if variance can be created in the knowledge intensity of the activity, the importance of the different stages or the importance of the actors. Survey work could complement this by offering a more generalized perspective of KIBS offshoring. It could, for instance, focus on measuring CD through scales and relating that CD to outcomes of a large number of KIBS projects inside a single firm (a survey within a case method).

Our ideas also ought to apply to less knowledge-intensive services and manufacturing, but there will be some differences. The key observation we make here is that our analysis suggests offshoring of these other activities is generally easier because, unlike is the case for KIBS, execution is by far the largest stage in less knowledge-intensive activities and manufacturing and repetition is a much more common feature of these other activities. Thus, the CD logic of our paper extends to explaining why, historically, offshoring started with manufacturing, followed by business processes and has only recently been extended to KIBS (Murray et al, 2009). By the same token, it makes sense that earlier theorizing focused less on knowledge and cognition and more on transaction costs, some of those caused by cultural distance, and resources more broadly. Similarly, there is scope for applying the idea of CD to outsourcing relationships, even in a domestic context. For instance, how does CD affect the performance effects of outsourcing? To conclude, this paper analyzed how an increase in CD through offshoring affects the production process of knowledge-intensive business services. We developed a set of propositions focusing on how activity modularity and repetition changes these outcomes. We believe this paper contributes to academic discussions on IB, by elaborating the concept of CD in service productions and by providing an activity-driven framework of offshoring of KIBS production processes.

REFERENCES

Aarikka-Stenroos, L. and Jaakkola, E., (2012). 'Value co-creation in knowledge intensive business services: A dyadic perspective on the joint problem solving process'. *Industrial Marketing Management*, **41**(1), 15-26.

Bals, L., Jensen, P. D. Ø., Larsen, M. M., and Pedersen, T. (2013). '*Exploring Layers of Complexity in Offshoring Research and Practice. In The Offshoring Challenge'.* in Pedersen, T., Bals, L., Jensen, P.D.O. and Larsen, M. (eds.) *The Offshoring Challenge: Strategic Design and Innovation for Tomorrow's Organization*. London, UK: Springer Science & Business Media.

Barney, J. B. (1999). 'How a firm's capabilities affect boundary decisions'. *Sloan Management Review*, **40**(3), 137-45.

Berry, H., Guillen, M., and Zhou, N. (2010). 'An institutional approach to cross-national distance'. *Journal of International Business Studies*, **41**, 1460 - 80.

Bertrand, O. and Mol, M. J. (2013). 'The antecedents and innovation effects of domestic and offshore R&D outsourcing: the contingent impact of cognitive distance and absorptive capacity'. *Strategic Management Journal*, **34**, 751-60.

Bettencourt, L., Ostrom, A., Brown, S., and Roundtree, R. (2002). 'Client Co-production in Knowledge-intensive Business Services'. *California Management Review*, **44**, 100-28.

Bowman, C. and Swart, J. (2007). 'Whose human capital? The challenge of value capture when capital is embedded'. *Journal of Management Studies*, **44**, 488-505.

Brandl, K. (2017) 'Direct and indirect value creation in offshored knowledge-intensive services' *International Journal of Physical Distribution & Logistics Management*, **47**, 137-55.

Brandl, K., Mol, M.J. and Petersen, B. (forthcoming) The reconfiguration of service production systems in response to offshoring: A practice theory perspective. *International Journal of Operations and Production Management*.

Brusoni, S. (2005). 'The limits to specialization: Problem solving and coordination in 'modular networks'. *Organization Studies*, **26**, 1885-907.

Buckley, P. J. and Casson, M. C. (1976). *The Future of the Multinational Enterprise*. London, UK: Homes & Meier.

Budhwar, P.S., Varma, A., Malhotra, N. and Mukherjee, A., (2009). 'Insights into the Indian call centre industry: can internal marketing help tackle high employee turnover?' *Journal of Services Marketing*, **23**(5), 351-62.

Campagnolo, D. and Camuffo, A. (2010). 'The concept of modularity in management studies: A literature review.' *International Journal of Management Reviews*. **12**, 259-83.

Caprar, D. V., Devinney, T. M., Kirkman, B. L., and Caligiuri, P. (2015). 'Conceptualizing and measuring culture in international business and management: From challenges to potential solutions'. *Journal of International Business Studies*, **46**(9), 1011-27.

Ceci, F., and Prencipe, A. (2013). 'Does distance hinder coordination? Identifying and bridging boundaries of offshored work'. *Journal of International Management,* **19,** 324-32.

Cohen, W. and Levinthal D.A. (1990). 'Absorptive capacity: A new perspective on learning and innovation'. *Administrative Science Quarterly*, **35**, 128-52.

Coleman, J. S. (1990) *Foundations of social theory.* Cambridge, Massachusetts: Harvard University Press.

Contractor, F.J., Kumar, V., Kundu, S.K. and Pedersen, T., (2010). 'Reconceptualizing the firm in a world of outsourcing and offshoring: The organizational and geographical relocation of high‐value company functions'. *Journal of Management Studies*, **47**(8), 1417-1433

Den Hertog, P. (2000) 'Knowledge-intensive business services as co-producers of innovation'. *International Journal of Innovation Management*, **4**, 491-528.

Dunning, J. H. (1993). *Multinational Enterprises and the Global Economy*. Wokingham, UK: Addison-Wesley.

Dyer, J. H. and Singh, H. (1998). 'The relational view: Cooperative strategy and sources of interorganizational competitive advantage'. *The Academy of Management Review,* **23**, 660–679.

Fainshmidt, S., White, G. O., and Cangioni, C. (2014). 'Legal distance, cognitive distance, and conflict resolution in international business intellectual property disputes'. *Journal of International Management*, **20**(2), 188-200.

Felin, T., and Foss, N.J. (2005). 'Strategic organization: A field in search of micro-foundations.' *Strategic Organization*, **3**(4), 441-55.

Gavetti, G., Greve, H. R., Levinthal, D. A. and Ocasio, W. (2012). 'The behavioral theory of the firm: Assessment and prospects'. *The Academy of Management Annals,* **6**, 1–40.

Goldstein, S.M., Johnson, R., Duffy, J. and Rao, J. (2002) 'The service concept: The missing link in service design research'. *Journal of Operations Management,* **20**, 121-34.

Grant, R. M. (1996). 'Toward a knowledge-based theory of the firm'. *Strategic Management Journal,* **17**, 109–22.

Greve, H. R. (2003). 'A behavioral theory of R&D expenditures and innovations: Evidence from shipbuilding'. *Academy of Management Journal,* **46**, 685–702.

Gulati, R. (1995). 'Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances'. *Academy of Management Journal,* **38**, 85–112.

Hansen, M. (1999). 'The search-transfer problem: The role of weak ties in sharing knowledge across organizational subunits. *Administrative Science Quarterly,* **44**, 82-111.

Harmon, A. (2008). 'The ethics of legal process outsourcing to India – Is the practice of law a "noble profession", or is it just another business?' *Journal of Technology Law & Policy*, **13**, 41-84.

Harvey, M., Speier, C. and Novicevic, M.M. (1999). 'The role of inpatriation in global staffing'. *International Journal of Human Resource Management*. **10**, 459-76.

Hutzschenreuter, T. and Kleindienst, I. (2006). 'Strategy-process research: What have we learned and what is still to be explored'. *Journal of Management*, **32**, 673–720.

Jahns, C., Hartmann, E., and Bals, L. (2006). 'Offshoring: Dimensions and diffusion of a new business concept'. *Journal of Purchasing and Supply Management*, **12**, 218-31.

Jensen, P. Ø. (2011). 'A passage to India: A dual case study of activities, processes and resources in offshore outsourcing of advanced services'. *Journal of World Business,* **47**, 311–26.

Jensen, P. Ø. (2009). 'A learning perspective on the offshoring of advanced services'. *Journal of International Management*. **15**, 181-93.

Kaplan, S. (2011). 'Research in cognition and strategy: Reflections on two decades of progress and a look to the future'. *Journal of Management Studies*, **48**, 665-95.

Kipping, M. and Kirkpatrick, I. (2013). 'Alternative pathways of change in professional services firms: the case of management consulting'. *Journal of Management Studies*, **50**, 777-807.

Kogut, B., and Singh, H. (1988). 'The effect of national culture on the choice of entry mode'. Journal of International Business Studies, **19**, 411-32.

Lane, P. J., Salk, J. E., and Lyles, M. A. (2001). 'Absorptive capacity, learning, and performance in international joint ventures'. *Strategic Management Journal*, **22**, 1139-61.

Langley, A. (2007). 'Process thinking in strategic organization'. *Strategic Organization,* **5**, 271–82.

Langlois, R.N. (2002). 'Modularity in technology and organization.' *Journal of Economic Behavior and Organization*, **49**, 19-37.

Larsen, M.M. (2016) Failing to estimate the costs of offshoring: A study on process performance. *International Business Review*, **25**, 307-18.

Leonardi, P. M. and Bailey, D. E. (2008). 'Transformational technologies and the creation of new work practices: Making implicit knowledge explicit in task-based offshoring'. *MIS Quarterly*, **32**, 411–36.

Levinthal, D. (2011). 'A behavioral approach to strategy—what's the alternative?'. *Strategic Management Journal*, **32**, 1517–23.

Lewin, A. Y., Massini, S, and Peeters, C. (2009). 'Why are companies offshoring innovation? The emerging global race for talent'. *Journal of International Business Studies*, **40**, 901–25.

Løwendahl, B. R. (1997). *Strategic management of professional service firms.* Copenhagen: Handelshøjskolens Forlag.

Luo, Y., Wang, S. L., Zheng, Q. and Jayaraman, V. (2012). 'Task attributes and process integration in business process offshoring: A perspective of service providers from India and China'. *Journal of International Business Studies*, **43**, 498–524.

Maister, D.H. (2012). *Managing the professional service firm*. New York, NY: Simon and Schuster.

Manning, S., Massini, S. and Lewin, A. Y. (2008). 'A dynamic perspective on next-generation offshoring: The global sourcing of science and engineering talent'. *Academy of Management Perspectives*, **22**, 35–54.

March, J. G. (2006). 'Rationality, foolishness, and adaptive intelligence'. *Strategic Management Journal*, **27**, 201–14.

Maskell, P., Pedersen, T., Petersen, B. and Dick-Nielsen, J. (2007). 'Learning paths to offshore outsourcing: from cost reduction to knowledge seeking'. *Industry and Innovation*, **14**, 239–57.

McDermott, G., Mudambi, R., and Parente, R. (2013). 'Strategic modularity and the architecture of multinational firm'. *Global Strategy Journal*, **3**, 1-7.

Metters, R. and Verma, R. (2008). 'History of offshoring knowledge services'. *Journal of Operations Management*, **26**, 141-47.

Mills, P.K., Chase, R.B. and Margulies, N. (1983). 'Motivating the client/employee system as a service production strategy'. *Academy of Management Review*, **8**, 301-10.

Mintzberg, H., Raisinghani, D. and Théorêt, A. (1976). 'The structure of "unstructured" decision processes'. *Administrative Science Quarterly*, **21**, 246–75.

Miozzo, M. and Grimshaw, D. (2005) 'Modularity and innovation in knowledge-intensive business services: IT outsourcing in Germany and the UK'. *Research Policy*, **34**, 1419-39.

Mol, M. J. and Kotabe, M. (2011). 'Overcoming inertia: Drivers of the outsourcing process'. *Long Range Planning*, **44**, 1160–78.

Mudambi, R. (2008). 'Location, control and innovation in knowledge-intensive industries'. *Journal of Economic Geography*, **8**, 699–725.

Mudambi, S. M. and Tallman, S. (2010). 'Make, buy or ally? Theoretical perspectives on knowledge process outsourcing through alliances'. *Journal of Management Studies*, **47**, 1434–56.

Murray, J. Y. and Kotabe, M. (1999). 'Sourcing strategies of U.S. service companies: A modified transaction-cost analysis'. *Strategic Management Journal*, **20**, 791-809.

Murray, J. Y., Kotabe, M. and Westjohn, S. A. (2009). 'Global sourcing strategy and performance of Knowledge-intensive business services: A two-stage strategic fit model'. *Journal of International Marketing*, **17**, 90–105.

Nelson, R. R. and Winter, S. (1982). *An evolutionary theory of economic change*. Cambridge, MA: Belknap Press of Harvard University Press.

Nooteboom, B. (2009). *A cognitive theory of the firm: learning, governance and dynamic capabilities*. Cheltenham: Edward Elgar Publishing Ltd..

Nooteboom, B., Van Haverbeke, W., Duysters, G., Gilsing, V. and Van Den Oord, A. (2007). 'Optimal cognitive distance and absorptive capacity'. *Research Policy*, **36**, 1016–34.

Patel, C., Budhwar, P. and Varma, A. (2012). 'Overall justice, work group identification and work outcomes: Test of moderated mediation process'. *Journal of World Business*, **47**, 213-22.

Peeters, C., Dehon, C. and Garcia-Prieto, P. (2015) 'The attention stimulus of cultural differences in global services sourcing'. *Journal of International Business Studies*, **46**, 241-51.

Prahalad, C. K. and Hamel, G. (1990). 'The core competence of the corporation'. *Harvard Business Review*, **68**, 79–91.

Reus, T. H., and Lamont, B. H. (2009). 'The double-edged sword of cultural distance in international acquisitions'. *Journal of International Business Studies,* **40**, 1298-1316.

Rodan S., and Galunic C. (2004). More than network structure: how knowledge heterogeneity influences managerial performance and innovativeness. *Strategic Management Journal*, **25**, 541–62.

Schein, E. H. (1990). 'A general philosophy of helping: Process consultation'. *Sloan Management Review*, **31**(3), 57-64.

Shearmura, R., Doloreux, D. and Laperrièred, A. (2015). 'Is the degree of internationalization associated with the use of knowledge intensive services or with innovation?' *International Business Review*, **24**, 457-65.

Simon, H.A. (1982). *Models of bounded rationality: Empirically grounded economic reason*, Vol. 3. Cambridge, MA: MIT press.

Simon, H.A. (2002). 'Near decomposability and the speed of evolution.' *Industrial and Corporate Change*, **11**, 587-99.

Simon, H.A. (1962). 'the architecture of complexity.' *Proceedings of the American Philosophical Society*, **106**, 467-82.

Stabell, C. B. and Fjeldstad, Ø. D. (1998). 'Configuring value for competitive advantage: On chains, shops, and networks'. *Strategic Management Journal*, **19**, 413–37.

Starbuck, W. R. (1992). 'Learning by knowledge intensive firms'. *Journal of Management Studies*, **29**, 713–40.

Sydow, J., Schreyögg, G. and Koch, J. (2009) Organizational path dependence: Opening the black box. *Academy of Management Review*, **34**, 689-709.

Szulanski, G. (1996). 'Exploring Internal Stickiness: Impediments to the transfer of best practices within the firm'. *Strategic Management Journal*, **17**, 27–43.

Tiwana, A. (2008) 'Does technological modularity substitute for control? A study of alliance performance in software outsourcing'. *Strategic Management Journal*, **29**, 769-80.

US Census Bureau. (2013). The 2012 Statistical Abstract: Section 15 Business Enterprise. http://www.census.gov/compendia/statab/2012edition.html (accessed on 12 July, 2013).

Van Knippenberg, D. and Schippers, M. C. (2007). 'Work group diversity'. *The Annual Review of Psychology*, **58**, 515-541.

Von Nordenflycht, A. (2010). 'What is a professional service firm? Toward a theory and taxonomy of knowledge-intensive firms'. *Academy of Management Review*, **35**, 155-74.

Voss, C. A. and Hsuan, J. (2009). 'Service architecture and modularity'. *Decision Sciences*, **40**, 541-69.

Williamson, O. E. (1985). 'Reflections on the new institutional economics'. *Journal of Institutional and Theoretical Economics*, **141**, 187–95.

Williamson, O. E. (1991). 'Comparative Economic Organization: The Analysis of Discrete Structural Alternatives'. *Administrative Science Quarterly*, **36**, 269–96.

Wuyts, S., Colombo, M.G., Dutta S. and Nooteboom, B. (2005). 'Empirical tests of optimal cognitive distance'. *Journal of Economic Behaviour & Organization*. **58**, 277–302.

Xu, D. and Shenkar, O. (2002). 'Note: Institutional distance and the multinational enterprise'. *Academy of Management Review*, **27**, 608-18.

Table I: Characteristics and predictions of various perspectives

	Transaction cost economics / internalization	**Resource-based view**	**Cultural distance**	**Cognitive distance**
Fundamental work	Buckley & Casson, 1976; Williamson (1985)	Barney (1991); Wernerfelt (1984)	Kogut & Singh, 1988	Cohen & Levinthal (1990); Nooteboom (2009)
Basic premise	Firms minimize sum of transaction and production costs and operating across borders increases transaction costs	Production costs are heterogeneous across firms and locations	Variations exist in national cultures (collectively)	Individuals perceive, interpret, understand and evaluate the world differently
Application to offshoring	Lewin et al. (2009), Mudambi & Venzin (2010)	Kedia & Lahiri (2007), Jensen (2011)	Peeters, Dehon, & Garcia-Prieto (2015)	Bertrand & Mol (2013), Ceci & Prencipe (2013)
Effects of offshoring	Offshoring trades in production costs for transaction costs; asset specificity and uncertainty, especially in joint presence of asset specificity, make offshoring harder	Offshoring occurs when offshore resource endowment (production costs) is better than onshore endowment; when recombination of existing knowledge assets through capabilities is complex, onshore production will be preferred	Offshoring induces need to overcome cultural distance	Offshoring increases costs of overcoming CD; CD from offshoring creates value but also a need for absorptive capacity; repetition helps to bridge CD

TABLE II: Most Salient Features of the Stages of the Value Shop and Effects of Offshoring Relative to Other Stages.

Stage	**Salient features**	**Impact of CD on production stage**	**Likelihood of offshoring**
Problem finding and acquisition	High uncertainty Specific assets Context dependent knowledge Strong client resources	Can hinder	Low
Problem solving	Codified knowledge Strong provider resources	Can bridge	High
Choice	High uncertainty Context dependent knowledge Strong client resources	Can hinder	Low
Execution	Codified knowledge Strong provider resources	Can bridge	High
Monitoring and evaluation	Integrative capabilities Strong client resources Context dependent knowledge Specific assets	Can hinder and bridge	Low to moderate