Delivering Knowledge across Boundaries: A Process Model of Knowledge Delivery in Offshoring Projects

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DELIVERING KNOWLEDGE ACROSS BOUNDARIES: A PROCESS MODEL OF KNOWLEDGE DELIVERY IN OFFSHORING PROJECTS

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Abstract

The lack of understanding on how to successfully deliver knowledge across boundaries in global offshoring projects, and on why the vendors cannot fully absorb the knowledge delivered from clients, is a gap in the existing literature that may account for the inefficient mechanisms used to deliver knowledge by clients and the shift of project management strategy from total outsourcing to global teamwork. To address this gap, an integrated framework is proposed to explain how the different types and amounts of knowledge are delivered across boundaries between vendors and clients in the outsourcing arrangements by combining the framework of knowledge boundaries and absorptive capacity. Applying the new theoretical lenses to analyze the case of BankCo offshore outsourcing project, the stages are identified, through which various types of knowledge are delivered from clients to vendors by sequential processes in each stage. In particular, our study reveals that the strategic shift from total global offshore outsourcing project to global distributed teamwork lends its opportunity to the hindrance of pragmatic boundary and insufficient knowledge absorptive capacity of the vendor organizations.

Keywords: Knowledge Boundary, Absorptive Capacity, Knowledge Delivery, Case Study

1 The three authors have equal contributions for this paper
1. **INTRODUCTION**

Global offshoring has become a piece of growing attractive cake in global service market in recent years, with revenues leaping from only U.S. $119 billion in 2000 (Kearney 2007) to U.S. $300 billion in 2008 (Beugre and Acar 2008). However, some practitioner outlets frequently report low success rates with offshoring deals. For example, a Gartner survey revealed a 50% failure rate for offshore outsourcing initiatives (Aron and Singh 2005). One of the key causes for low success rates of offshore projects falls into the excessive costs incurred in knowledge transfer between onsite teams and offshore teams (Carmel and Agarwal 2002). Those excessive costs derive from delivering critical business knowledge and requirements from onsite clients to offshore vendors to ensure service quality and continuity (Chua and Pan 2008; Von Krogh et al. 2000). In offshore outsourcing project, the process of knowledge delivery from onshore teams to offshore teams is inhibited by the tacit nature (Von Krogh et al. 2000) and path-dependent nature of knowledge (Chua and Pan 2008). Delivering high level of client-specific knowledge about idiosyncratic business processes and software systems generates extra costs for vendors in offshore project (Dibbern et al. 2008). In order to decrease the cost and ensure the quantity and quality of knowledge delivered, to understand and facilitate the delivery process of knowledge of high level of novelty and specialization could be necessary. Thus it is important to explore and examine how the knowledge is effectively delivered from clients to vendors in the offshore outsourcing context.

However, outsourcing studies dwelling on the issue of knowledge delivery have thus far mainly focused on how clients leverage on the knowledge delivered from vendors (e.g., Ko et al. 2005; Willcocks et al. 2004), while scant attention has been paid to vendor’s perspective. Within the paucity of works devoted to knowledge delivery from vendors’ perspective (e.g., Dibbern et al. 2008; Modi and Mabert 2007), the emphasis has been primarily on causal models exploring and examining antecedents for successful knowledge delivery, rather than a close inspection of the actual delivery process. The delivery processes will change with the level of novelty, specialization, and dependence of knowledge (Carlile 2002) while previous studies cannot explain the shifting of knowledge delivery mechanisms. Thus, a detailed investigation of the actual process of knowledge delivery incorporating various levels of knowledge delivery mechanisms is needed to enrich our understanding of knowledge delivery processes. In addition, previous literature on knowledge delivery has also discovered that clients’ heterogeneous capabilities, such as absorptive capacity, can influence their abilities to take advantage of external knowledge (Ko et al. 2005). Applying this logic to vendor’s perspective, we believe that the efficiency and effectiveness of various types of knowledge delivery mechanisms for delivering processes may hinge on vendors’ absorptive capacity. The notion of absorptive capacity can explain the speed of knowledge delivery in the outsourcing project.

With the motivations stated above, we propose a processual framework by integrating Carlile (2002)’s framework of knowledge boundary with literature in absorptive capacity. We separate the actual knowledge delivery lifecycle of a multinational bank offshore project into sequential stages and delineate how different types of knowledge are delivered across boundaries to vendors and how boundary objects are coupled with absorptive capacity in enhancing delivery efficiency. In particular, we investigate the underlying reasons behind the difficulty of knowledge delivery in this offshore outsourcing project. We reach the conclusion that the knowledge boundary can only explain which types of knowledge are delivered and must be complemented by absorptive capacity, which explains how much knowledge of a specific kind can be delivered.

2. **LITERATURE REVIEW**

Knowledge has long been recognized as a valuable resource for organizational growth and competitive advantage sustainability, especially for organizations competing in uncertain environments (Miller and Shamsie 1996). According to the knowledge-based view of the firm, knowledge is the foundation of an organization’s competitive advantage (Grant 1996) and, ultimately, the primary driver of an organization’s value (Teece 2000). However, some strategic transfer and migration of it (e.g. joint venture) is usually impeded by the tacit nature of knowledge (Von Krogh et
al. 2000), and its stickiness (Suzlanski 1996). Knowledge stickiness makes it laborious for organizations to absorb it from their partners and utilize it in their own innovation processes (Carlile 2002). This barrier for efficient knowledge delivery has been denoted as knowledge boundary by Carlile (2002, 2004), which would incur great efforts and costs for organizations sharing their knowledge with each other.

### 2.1 Knowledge Boundary

Knowledge boundary was derived from the problem solving and knowledge creation across functions (Brown and Duguid 2001). The framework of knowledge boundary is developed by Carlile (2002, 2004), and is further reconfirmed and extended by Ferlie et al (2005). The basic argument of this framework is that knowledge within a function actually hinders problem solving across functions because knowledge is localized, embedded and invested in practice (Carlile 2002) and also in professionals (Ferlie et al. 2005). This specialization of knowledge in practice, and social and cognitive boundaries (Ferlie et al. 2005) make especially difficult working across functional boundaries and accommodating the knowledge developed in another practice.

According to Carlile’s framework, knowledge differs from each other in terms of the degree of novelty, specialization and dependence (Carlile 2004). Specialization means the difference in type and amount of knowledge which consumes great effort to adequately share and assess each other’s knowledge (Carlile 2002). Dependence refers to a condition where two entities must take each other into account if they are to meet their goals (Carlile 2002). As the novelty increases, the specialization and dependence will also increase (Brown and Duguid 2001).

Different levels of novelty, specialization, and dependence will create different knowledge boundaries (i.e., syntactic, semantic and pragmatic boundary) which require different boundary objects and approaches to overcome (Carlile 2004). For the basic level, when the knowledge is low in novelty, specialization and dependence, a common lexicon which is created by storage and retrieval of knowledge (Davenport and Prusak 1998) can facilitate the explicit knowledge transfer across the syntactic boundary. In sum, actors in knowledge delivery require a common dictionary to transfer explicit knowledge across syntactic boundary.

For the intermediate level, when the novelty, specialization and dependence of knowledge arise, a common meaning referring to a set of terms and habits shared by both parties of knowledge delivery is required to ensure accurate translation and interpretation of the knowledge across the semantic boundary. By paying attention to the challenges of conveyed meaning and the possible different interpretations by individuals, this translating approach recognizes the individual and contextual aspects in knowledge delivery, and pays particular attention to the tacit nature of knowledge (Polanyi 1966). In a nut shell, when novelty of knowledge arises, a common understanding is a must for parties to grasp the actual meaning of knowledge delivered from counterparts and to avoid misinterpretation.

The last level is the pragmatic level, in which a common interest has to be achieved when participants negotiated with each other on the scope, consequences and conflict solutions of knowledge delivery. Despite the previous two processes, in some cases of high knowledge novelty, specialization and dependence, conflicts among stakeholders will surface when their goals of knowledge delivery contradict with each other. To solve the conflicts and preserve the fruits of knowledge delivery, there must be an overall process for transforming existing knowledge to deal with the negative consequences that arise. This transforming approach refers to a process of altering current knowledge, creating new knowledge, and validating it within each function and collectively across functions (Carlile 2002). It highlights the importance of understanding the consequences that exist between things that are different and dependent on each other. To sum up, common lexicon and meaning cannot guarantee the success of knowledge delivery when knowledge is highly novel, specific and path-dependent; knowledge has to be transformed to reconcile and coordinate the interests of different participants.
The whole framework of knowledge boundary is presented in figure 1 (adapted from Carlile (2004)). The process of knowledge delivery between two parties consists of three sub-processes: transfer, translate and transform.

**Figure 1. Framework of knowledge boundary (Adapted from Carlile 2004)**

### 2.2 Absorptive Capacity

Absorptive capacity, which was coined by Cohen and Levinthal (1990), has been frequently used by researchers to interpret the organizational and individual’s learning (Lane et al. 2001), knowledge sharing (Cummings 2004) and innovation behaviors (Gupta and Govindarajan 2000). An organization’s absorptive capacity is defined as the ability of the firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends (Cohen and Levinthal 1990). They argued that absorptive capacity of a firm is critical to its innovation capabilities. Exposing to external knowledge, firms have to go through three processes (i.e. acquisition, assimilation and application) in order to utilize and benefit from the external knowledge in their innovation activities.

Absorptive capacity is nurtured in a prolonged process of investment and knowledge accumulation. As suggested by Cohen and Levinthal (1990), organizational units with a high level of absorptive capacity invest heavily in their internal development (e.g., R&D and personnel training) and thus possess strong capability to utilize external knowledge to produce innovations. When the absorptive capacity is low, organizational units will be greatly paralyzed and cannot exchange knowledge and learn from each other. For example, in a study of 122 best-practice transfers in eight companies, Szulanski (1996) found that lack of absorptive capacity marked a major barrier to internal knowledge transfer within organizations. Apart from this, the absorptive capacity of a firm may also stem from its openness towards knowledge sharing such as the strategic alliance and participation in collaboration (Caloghirou et al 2004). Furthermore, it has been also noted that a firm’s absorptive capacity is largely a function of the firm’s level of prior related knowledge (Cohen and Levinthal 1990).

As the offshore outsourcing activities involve various types of knowledge (e.g. technological and business) being intensively delivered from clients to vendors across vendor-client knowledge boundaries, and vendor’s absorptive capacity for these various kinds of knowledge determines the amount of knowledge delivered, we believe that integrating the framework of knowledge boundary and absorptive capacity theory is elucidative in explaining how the knowledge is delivered across the intellectual boundaries between vendors and clients and why the total offshore outsourcing project ends up with a global teamwork.

### 3. METHODOLOGY

Given that the targeting phenomenon of our research, which is the underlying process through which knowledge is effectively delivered in offshoring arrangements, is a newly-emerged and highly multi-
faceted complex practice, we employed the interpretive case study approach to address our research questions (Walsham 1995). As our research topic requires contextually rich descriptions with emphasis on language and social relationships rather than numbers and variables, the qualitative data collection technique was preferred (Yin 1994). Based on the methodology we have chosen, BankCo, a multinational banking organization, is selected as the single research site as its IS function is sent offshore for software development and maintenance.

The case study was carried out using both structured and unstructured interviewing. Project and programme documentation, published sources, follow-up e-mails and telephone calls were also used as other sources of information (Yin 1994). Formal interviews were conducted at the different levels of the organization (See Table 1). At the organization level, three interviewees from the program management team were interviewed to get an understanding of the objectives, procedures and outcome of the whole program. At the group level, one team-specific senior manager and five project managers were interviewed on the planning and execution of the transition project. Finally, at the individual level, seven systems analysts and programmers were interviewed on the actual execution of the knowledge transfer. Interviewees comprised of a mix of onshore and offshore staffs from two business application teams. The interviewees were asked to describe the role they played in the transition, their experience, feelings, and concepts of success about the transition processes.

Data analysis of the case started by breaking down the events in the chronological order of the knowledge transfer, translate and transform. Care was taken to ensure that equal attention was given to all stages (Yin 1994). Transcripts of interviews were scrutinized for patterns and recurring themes. For example, one of the themes that emerged was: depending on the types of knowledge that was being transferred, translated or transformed, different boundary spanning approaches were adopted. An iterative process of comparing empirical evidence with existing literature gave rise to possible theoretical conceptualizations. The data were further analysed using these theoretical concepts. Triangulation was done within a team, among onshore staffs and offshore staffs at different project management and systems analyst levels.

<table>
<thead>
<tr>
<th>Interviewee Type</th>
<th>No. of Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program management</td>
<td></td>
</tr>
<tr>
<td>Program director</td>
<td>1</td>
</tr>
<tr>
<td>Transition manager</td>
<td>1</td>
</tr>
<tr>
<td>Quality manager</td>
<td>1</td>
</tr>
<tr>
<td>Business application software teams</td>
<td>Onshore  Offshore</td>
</tr>
<tr>
<td>Senior manager-in-charge</td>
<td>1</td>
</tr>
<tr>
<td>Project management</td>
<td>3</td>
</tr>
<tr>
<td>Systems analysts and programmers</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

*Table 1: list of interviewees*

4. CASE DESCRIPTION AND ANALYSIS

4.1 Organizational Background

BankCo is a multinational bank with 30,000 staffs located in 50 countries. All the workers of BankCo in various countries with different cultural backgrounds share all kinds of knowledge with their colleagues every day, such as sharing business and technical knowledge with peers in the same location or cross-national locations. Before 2001, the onshore working sites of BankCo mainly located in United Kingdom, Hong Kong and Singapore. In 2001, after a review of its global technology business development and support organization, BankCo decided to progressively relocate its working sites to offshore locations, which are India and Malaysia.

However, some of the business of onshore locations had been retained in-house and the vendors’ human resources only amounted to about 25% of the total personnel of BankCo. This multi-sourcing strategy was due to two reasons. Firstly, some of the knowledge of onshore work was considered highly strategically sensitive or very hard to learn by offshore workers. Such kind of sticky
knowledge deeply embedded in onshore workers’ tacit behaviors and cannot be easily and fully delivered to the offshore teams. Secondly, the profit requirement of vendors makes it more cost effective for BankCo to have its own in-house resource.

Thus, to enact and enhance the knowledge delivery from onshore sites to offshore sites, BankCo sequentially went through three phases in which it conducted different processes and utilized different mechanisms to facilitate the delivery of knowledge across the knowledge boundaries between onshore and offshore teams. These three phases were labelled as: transfer, translation and transformation. The specific information about the three processes will be presented in the case analysis section.

Through the above three phases, BankCo had successfully delivered most of its knowledge to its offshore vendors. However, it was suddenly realized that although the technological knowledge of the systems analyst and programmers can be wholly delivered to offshore locations, some of the more specific business knowledge and domain knowledge of senior analysts and project managers could not be easily learnt and absorbed by offshore staff. In order to quickly utilize the intelligence of offshore members and make sure they shoulder their responsibilities, BankCo temporarily changed its total outsourcing strategy into global teamwork in which senior members of onshore teams cooperated with offshore workers. The global teamwork had been performing effectively in aligning different interests between BankCo and its vendors as well as facilitating the delivery of business knowledge. Although the outsourcing project was officially completed at the end of 2004, the replacement of onshore staffs with offshore staffs was still going on even though the scale was smaller.

4.2 Case Analysis

4.2.1 Transfer: common lexicon creation and knowledge acquisition

The knowledge delivery lifecycle starts with explicit knowledge transfer phase (See the S1: Transfer in figure 2). Firstly, project initiation was done by the BankCo onshore managerial team. The Programme Management Office decided which teams to be sent offshore and the percentage of onshore and offshore team composition planned the schedule of knowledge delivery and created transition guide and training contents.

Besides the detailed Transition Guide, the Programme Management Office also provided the offshore teams with the explicit information of this project. After initiating the project by careful planning process, various kinds of onshore knowledge were pulled together to prepare for the later delivery process. Onshore project managers called for different workers in different onshore locations to prepare training materials in their own expertise fields and collected them together. As one onshore project manager mentioned:

“... If there were certain topics that we ourselves couldn’t do because we were not familiar with it, we will bring in the people from Hong Kong or Singapore. We planned it such that when the person flew over [to the offshore location], they would take a few topics and do the training.”

These collective explicit knowledge repositories which offshore teams were assumed to know in order to form a solid knowledge hierarchy were presented in the manuals documents and presentation slides.

After the preparation of explicit knowledge, the detailed explicit knowledge was transferred to offshore members through face-to-face, one-to-many presentations. These presentations aimed at imparting as much explicit business and technological knowledge to all the offshore members as possible. As mentioned by an offshore project manager:

“The training was not a waste of time - it was more of giving us the awareness. I would consider it more of an awareness training. I don’t think that a person goes into a training room and becomes perfect. At least he is aware that we have this [functionality] and we have that [feature].”

The above processes including project initiation, knowledge centralization and explicit knowledge impartation were used to establish a shared and stable syntax which ensured accurate communication between both teams. Through these processes, BankCo had created a common lexicon as a boundary
object between onshore and offshore members and allowed offshore members to acquire explicit knowledge delivered across syntactic boundary.

In order to evaluate the amount of explicit knowledge acquired by offshore members, oral and written quizzes were provided by onshore teams to check whether the offshore members had formed a general impression and sufficient grasp for the syntactic knowledge delivered in this phase.

![Figure 2: Transferring Phase](image)

4.2.2 Translation: common meaning creation and knowledge assimilation

After delivering explicit knowledge across syntactic boundary, BankCo started to deliver more tacit knowledge in translation phase (See the S2: Translate in figure 2). This type of knowledge was stickier and required a deeper understanding by offshore members. The interpretation and assimilation of technological and business knowledge were facilitated by several processes launched by onshore teams. The first process was the on-job-training (OJT) in which onshore team members flew to offshore sites and showed the offshore members how to do the work. A group of offshore staffs sat next to the onshore staffs and observed the methodology used to solve a problem, and noted the business parties that onshore staffs had to get in touch with to update the status. By participating in this kind of “live show” of dealing with the job, offshore staffs had the chance to gain a deeper meaning of the explicit knowledge they had learnt in previous transfer phase. As mentioned by an onshore project manager:

“If that, OJT (on-the-job training) was more effective, whereby he is having to live situations and understanding it better and getting things done more effectively.”

Another process onshore members had used is the playback sessions. In these sessions, the offshore team members presented the knowledge they have acquired and assimilated back to the onshore teams. The onshore members then would make a trip to offshore location to check for the gaps in the knowledge and retrain the offshore teams on the areas that were lacking or unsatisfying. They would also observe whether the offshore teams had integrated their learning into the in-country processes correctly.

While the on-job-training was more about the knowledge flows from senders to receivers, the Playback session ensured the offshore members interpreting the knowledge by a form of learn-by-doing and also the onshore members learning of new knowledge born in the offshore context. The exchange and coordination of meanings of process between onshore members and offshore members was the main theme of these two activities. These processes were used to establish a shared and stable semantic understanding which ensured deep communication between both teams. Through these processes, BankCo had created a common meaning as a boundary object between onshore and offshore members and allowed offshore members to assimilate tacit knowledge delivered across semantic boundary.

The individual interview assessments and team reviews were used for the evaluation of assimilation progress of the offshore members. The amount and accuracy of assimilation of semantic knowledge by offshore members were assessed. During the individual interview assessments, the offshore members were asked to describe in detail the key areas in a particular topic or problem. They were
required to guess what questions they would receive and find out the answers by themselves. As an onshore project manager mentioned:

“Before the test, we actually told them the topics that we were going to cover. They had to go and guess the questions. We had all the questions ready but different people would get different questions. We will pick-and-choose which questions we wanted to ask them. So there were two or three of them that didn’t do so well. They had to go back and study again and then come for another test.”

4.2.3 Transformation: common interest creation and application

Knowledge has to be transformed before it could be applied to real work (See the S3: Transform in figure 2). Although most of the current explicit as well as tacit knowledge had been substantially delivered to offshore teams, some knowledge which deals with the problems happened in the past was not likely to be experienced by offshore members only through the above phases. Support simulation was then used as a way of prototyping the past problems and solutions for the offshore members thereby enhancing their abilities to cope with all the possible problems encountered in their jobs. This kind of mechanism was created as an interest-free stimulation for innovation. As mentioned by the draft of our record:

“Not all technical issues could be experienced on-the-job. Many technical problems that happened in the past were unlikely to reoccur. However, they provided a good way of testing the offshore team’s knowledge of the system and the thought process on how to solve the problem. In support simulation, the onshore staff selected past problem tickets and got the offshore staff to work on them. The offshore staff, through thinking out loud, walked through how they would solve the problem.”

As increasing tacit knowledge was delivered across knowledge boundaries of the two teams, the offshore teams were assumed to take over their responsibilities to do the jobs on their own. Some onshore Quality Managers would audit the team Transition Process and check whether the business users were satisfied. Besides this, onshore and offshore project managers would jointly do a team readiness assessment. These two mechanisms can be seen as ways of negotiating the different interests among the different stakeholders. By applying the knowledge delivered to their work processes, offshore members performed the onshore work back to all the stakeholders and try to meet their needs. Only when every stakeholder was satisfied with the performance of offshore team members can the onshore staffs be replaced by the satisfying offshore staffs.

After the prototyping and interest negotiating processes, the interests of the onshore teams and offshore teams tended to be harmonious with each other. This established shared interest facilitated the knowledge delivering across the pragmatic boundary. However, some knowledge which was quite sticky was deeply rooted in the onshore organizational memory and practice, and was too hard to deliver to offshore teams either due to great effort needed for delivery or high sensitiveness of the knowledge. Some onshore senior analysts and project managers were reluctant to share their whole business knowledge with offshore teams in fear of losing their competence and their positions. Also they were tired of teaching the offshore members the depth of knowledge required to do analysis and design. These subjective and objective hindering factors resulted in the low application opportunity for the offshore members, which in turn undermined the application capability of the offshore members. Thus, some outsourced onshore jobs were not satisfactorily done due to the low application capability of the offshore members, eventually some of the more high-level onshore members were finally retained at the end of project.

Since some of the onshore members were not replaced at the end of project, and the offshore members were not ready to take over the whole production process on their own, BankCo quickly realized that they had to change the total outsourcing strategy into global teamwork. The personnel of the global teamwork were constituted by both senior managers or analysts from onshore teams and lower technicians (programmers) or analysts from offshore teams. The change of strategy, which can be seen as a kind of strategic knowledge conversion, was due to the insufficient knowledge delivery across pragmatic boundary between onshore and offshore teams at the end of project. The insufficient
knowledge delivery was in turn due to the insufficient common interest on the pragmatic boundary and unsatisfying application capability of the offshore members. Thus the strategy of global teamwork acted as a boundary object which temporarily enhanced the knowledge application on the pragmatic boundary and guaranteed the fluency of the service at the end of outsourcing project. In the global teamwork strategy, both the onshore and offshore members reported to one global team manager, the manager would continue to negotiate the interests between onshore and offshore members, which acted as a boundary object for continuous delivering of knowledge. The global teamwork seemed to work very well, as observed by an offshore manager:

“I think what helped most was the re-organization where all of us reported into one common manager. The mindset is so different now.”

5. DISCUSSION AND CONCLUSION

5.1 Knowledge delivery across boundary

From past literatures, we identified three types of boundary objects for enhancing knowledge delivery across three kinds of boundaries based on the framework of knowledge boundary and also discovered three capabilities by which offshore members absorb the knowledge flown from onshore teams. The following stream of reporting discusses how boundary objects are established and complimented or supported by offshore employees’ absorptive capacities in facilitating seamless knowledge delivery.

5.1.1 Transferring across syntactic boundary

The transferring of knowledge across syntactic boundary requires two preconditions: (1) creating a common lexicon between onshore and offshore teams, (2) acquiring sufficient explicit knowledge from onshore teams by offshore teams. Based on the empirical evidence uncovered in BankCo’s project, first, by project initiation, knowledge centralization and explicit knowledge impartation, the common lexicon between onshore teams and offshore teams had been created. Project initiation created a consensus between both teams on the detailed schedule and steps for the whole delivery process. Knowledge centralization allowed the various kinds of knowledge distributed across onshore departments and locations to be aggregated into one point for delivery. Explicit knowledge impartation aimed at exposing the offshore members to as much as explicit knowledge and providing them with the opportunity to get access to the knowledge. Second, only when the explicit knowledge is sufficiently acquired by offshore members could the onshore teams start to deliver tacit knowledge. By evaluation for the knowledge acquisition, onshore managers can check whether the explicit knowledge delivered in the common lexicon is sufficiently acquired by offshore members. This could help onshore managers to control and improve the acquisition process and decide whether to start delivering tacit knowledge. Oral and written quizzes were used to evaluate this acquisition progress.

5.1.2 Translating across semantic boundary

The translation of knowledge across semantic boundary also requires two preconditions: (1) creating a common meaning between onshore and offshore teams, (2) assimilating sufficient tacit knowledge from onshore teams by offshore teams. In BankCo’s project, first, by cross-team interaction and interpretation, the common meaning between onshore teams and offshore teams had been created. Cross-team interaction and interpretation were facilitated by on-job-training (OJT) and Playback sessions. During these processes, onshore and offshore members exchanged and coordinated their interpretations for the jobs and created a common meaning of the tacit knowledge assimilated by offshore members. Second, only when the tacit knowledge is sufficiently assimilated by offshore members could the offshore members start to apply the knowledge. By evaluation of knowledge assimilation, onshore managers can check whether the tacit knowledge delivered via the common meaning is sufficiently assimilated by offshore members. This could help onshore managers to control and improve the assimilation process and decide whether to allow the offshore members to apply the knowledge. The individual interview assessment and team review were used to evaluate the assimilation results.
### 5.1.3 Transforming across pragmatic boundary

The transformation of knowledge across pragmatic boundary also requires two preconditions: (1) creating a common interest between onshore and offshore teams, (2) applying sufficient knowledge to real work by offshore teams. In BankCo’s project, first, by prototyping and interest negotiation, the common interest between onshore teams and offshore teams had been created. Prototyping was facilitated by support simulation. In support simulation, offshore members can learn the solutions for some past problems without injuring anyone’s interest. What they did was mainly situating themselves in past problematic conditions and trying to learn from onshore members’ experience and solutions. This is regarded as not hurting anyone’s interest. Interest negotiation was facilitated by the audit of Quality Managers as well as the team readiness assessment by onshore and offshore managers. By these processes, onshore and offshore stakeholders jointly checked the readiness of the offshore members and decided whether the jobs could be independently handled by offshore teams. Onshore and offshore members negotiated and parallelized their interests for the jobs and created a common interest of the applicability of knowledge by offshore members. Second, only when the knowledge is sufficiently applied by offshore members into real work could the outsourcing project be regarded as a success.

By making a distinction among the three phases of knowledge delivery and integrating different mechanisms and actions as boundary objects supporting the creation of common knowledge across the three temporal phases, a framework of the underlying process through which knowledge is delivered from onshore teams to offshore teams can be inductively derived (refer to the red circle in Figure 3).

![Figure 3. How knowledge is delivered from onshore teams to offshore teams](image)

#### 5.2 Barriers for knowledge delivery and their influences on offshore outsourcing strategy

##### 5.2.1 Different understanding makes interpretive knowledge delivery more difficult

From the processual framework above, we can see that knowledge is delivered with the help of boundary objects through the transferring, translating and transforming processes. In the translating process, common meanings are established between two parties when knowledge is not easily described or understood by the original understanding. In this process, knowledge is of highly practice-embedded and sticky to the practice and employees who hold them, which requires offshore team members to spend more time and efforts to assimilate the interpretive knowledge in this process than syntactic knowledge in the transfer process. The effectiveness of establishing the common meaning directly affects the amount of interpretive knowledge assimilated by offshore team members in this process. From the case, on-the-job training is one of the methods to establish common meaning and translate some knowledge into the daily knowledge for the offshore members to pick up them easily and demonstrate some practices. After this process, most of the interpretive knowledge is translated and properly absorbed by the offshore team members.
In the transforming process, two teams are endeavoring to establish common interest to deliver more competitive knowledge from onshore members to offshore members. The pragmatic knowledge delivered is a type of competitive knowledge that employees gain from the daily working and practice. Offshore members have to replace their competitive knowledge with the onshore member’s knowledge, which requires more time and efforts to master those types of knowledge and make sure the newly absorbed knowledge is enough to handle their jobs. Although the simulation process prototypes the real business routines, offshore members have difficulty in transforming the knowledge for their own use. They are not likely to convert knowledge they learned and put the new knowledge into application for the sake of its path dependence in the sense that they are not willing to discard their hard-won skills. Besides, pragmatic knowledge is embedded in clients’ experience and practices, thereby not easy to be transformed, converted and applied into practice for offshore members.

On the other side, the onshore team members are not willing to impart their unique knowledge to offshore team members who will be laid off after the project, because doing so will jeopardize their strategic advantages. In order to keep their own advantages, the onshore team members will hoard certain knowledge (Wasko and Faraj 2005). In the offshore team, the lack of motivations to spend time in converting and applying new knowledge into work by offshore teams makes the knowledge hoarding problem much worse, which could reduce vendors’ work efficiency and lower their performance level.

In conclusion, the source of pragmatic knowledge is insufficient and the absorptive capacity of offshore team member is not high enough to transform pragmatic knowledge for their own use. In the end, BankCo realized that the knowledge of the systems analyst and programmers could be replicated in the offshore locations. However, the more senior analysts and project managers possessed application domain knowledge, which were not easily transferred to the offshore staffs. The intention of replicating or “outsourcing” the whole onshore team capability into an offshore team did not seem viable. Therefore, the BankCo managers changed their original strategy as a result of the fact that the amount of interpretive and pragmatic knowledge absorbed by the offshore team is not enough for them to independently operate the routines that are previously conducted in the onshore company. By integrating both the remaining senior members of the onshore team with the offshore team into one cohesive team - one global team with members in different geographic locations, reporting into one manager, BankCo successfully facilitated the knowledge delivery. This enabled the global teams to work together, share knowledge and experiences, and solve problems together as one. Onshore team members with highly pragmatic knowledge do not have to be laid off and offshore team members have more time to absorb and transform the skills taught by onshore team members for their own use.

6. CONCLUSION

This article demonstrates at a deeper level why communication across offshore outsourcing participations is hard and how different types of knowledge are delivered, based on the knowledge boundary framework and absorptive capacity. The data of this study is collected by case study method which has been criticized as lacking of statistically generalizability.

Although limitations exist, this article bears a lot of merits. Theoretically, this article proposes an integrative framework by combining the framework of knowledge boundary and absorptive capacity concept. By doing so, this article extends the original knowledge boundary framework by discussing efficiency issues of knowledge delivery and explaining the success of knowledge delivery in the presence of appropriate boundary objects and high absorptive capacity of receivers.

Practically, this article provides a comprehensive and strong explanation for knowledge delivery in the offshore outsourcing process. Moreover, it gives inspiration for the creation of new and useful knowledge delivering mechanisms for the offshore outsourcing project. Third, it provides some strategies to facilitate inter-organizational knowledge delivery and prevent some kind of knowledge from leaking to competitors. Organizations can train all their employees the set of shared codes and norms in addressing the knowledge delivery in the whole organization.
Reference


