KNOWLEDGE TRANSFER IN IS OFFSHORING: PROCESSES, ROLES, AND SUCCESS FACTORS

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Abstract

IS offshoring research regarding knowledge transfer processes, roles involved, as well as influencing factors is characterized by its diverse and heterogeneous nature. Covering the last fifteen years of IS offshoring research, this paper provides a consolidated view of the field of study. It presents a generic knowledge transfer process consisting of four stages and five milestones. These stages are characterized and evaluated according to their relevance for knowledge transfer, the types of knowledge transferred, the main activities and methods for transfer and testing, as well as the goals pursued. Furthermore, we aggregate the diverse literature findings relating to individuals who facilitate knowledge transfer processes into a general role. We label this role "offshore coordinator" and present its core tasks and necessary skills. In addition, we identify and cluster core factors that influence success or failure of knowledge transfer. In summary, our study answers calls to discontinue with empirically derived definitions in favor of theory-based conceptualization of the IS offshoring research field with respect to knowledge transfer processes, roles, and success factors. Future studies can build on these results and examine questions with respect to particular characteristics of knowledge transfer processes and their influencing success and failure factors.

Keywords: Offshoring, Knowledge transfer, Knowledge management, Information systems.

1 INTRODUCTION

Information systems (IS) offshoring is the transfer of IS services to a service provider outside the service consumer's home country. There has been an increase in IS offshoring driven by benefits such as cost savings, concentration on core competences, and access to IS skills (e.g., Dhar & Balakrishnan 2006; Gonzalez et al. 2010; Klimpke et al.; Westner & Strahringer 2010). However, IS offshoring is also associated with numerous risks, e.g., different culture and mentality, language problems, higher hidden costs as well as unsuccessful knowledge transfer which could result in project failure (e.g., Gonzalez et al. 2010; Klimpke et al. 2011).

Prior research found that knowledge transfer plays a crucial role for the success of IS offshoring projects (Avison & Banks 2008; David et al. 2008; Gupta & Raval 1999; Levina & Ross 2003) while unsuccessful knowledge transfer is one of the main reasons for IS offshoring initiatives' failure, in particular during the first years (Carmel & Tjia 2005; Chen et al. 2013). In addition, knowledge transfer between onsite clients and offshore vendors to ensure service quality and continuity faces many challenges and difficulties which could result in excessive costs (Chua & Pan 2008; Dibbern et al. 2008; Krogh et al. 2000; Larsen et al. 2013). Hence, a range of studies examine knowledge transfer processes, the roles involved as well as influencing factors from different perspectives in IS offshoring. Although there has been research on specific aspects of knowledge transfer and building, a holistic and consolidated perspective on this particular research field is missing. With the motivation stated above, we pose the following research questions:

1) How does knowledge transfer between client and vendor companies take place?

2) Which roles are important to facilitate knowledge transfer and what are the characteristics of these roles?

3) What are the factors that influence the knowledge transfer between client and vendor companies?

These questions are addressed by analyzing the academic literature related to knowledge transfer in IS offshoring. Covering the last fifteen years of research regarding knowledge transfer processes, roles, as well as critical success and failure factors in IS offshoring, this paper answers these questions by consolidating respective results of the field of study and integrating them within a conceptual framework. In addition, our study lays a first foundation to discontinue with empirically derived definitions in favor of theory-based conceptualizations of the IS offshoring research field (King & Torkzadeh 2008; Wiener et al. 2010).

The remainder of this research paper is structured as follows: Section 2 gives a brief overview over the theoretical foundation of knowledge transfer processes and roles as well as critical knowledge transfer factors. In the subsequent section 3, we combine and aggregate findings from different studies within a new conceptual framework and thus try to extend the IS offshoring body of knowledge. Specifically, we conceptualize a generic knowledge transfer process, the major role to facilitate this process as well as the core factors influencing success or failure of knowledge transfer processes. The final section 4 concludes with a discussion of the research findings and outlines potential future research areas.

2 THEORETICAL FOUNDATION AND LITERATURE REVIEW

Knowledge is defined as "justified true belief" and can be distinguished between tacit and explicit knowledge (Nonaka 1994). While tacit knowledge is difficult to communicate and cannot be easily formalized and transferred, explicit knowledge is transmittable in formal, systematic language (Nonaka & Takeuchi 1995; Polanyi 1966). According to Nonaka (1994) and Nonaka and Takeuchi (1995), the creation of knowledge occurs through conversion between tacit and explicit knowledge within four modes of knowledge conversion, the so-called SECI model: (1) creating tacit knowledge through shared experience ("s" for socialization), (2) conversion of tacit knowledge into explicit knowledge ("e" for externalization), (3) creating explicit knowledge from explicit knowledge ("c" for combination), and (4) conversion of explicit knowledge into tacit knowledge ("i" for internalization).

The transfer of knowledge is defined as a "process through which one unit (e.g., group, department, or division) is affected by the experience of another" (Argote & Ingram 2000, p. 151). A proven process model of knowledge transfer which includes four stages is provided by Szulanski (1996; 2000). The first initiation stage starts with identifying the problem and the required knowledge to address the problem within the organization. The discovery of the required knowledge may include a search for suitable solutions. All events required for decision-making take place. Once the decision to transfer is made, the implementation stage begins. In this stage the exchange of information and resources between source and the recipient takes place. When the recipient starts to use the transferred knowledge, the ramp-up stage begins. In this stage, the recipient identifies and resolves unexpected problems. At the end of this stage, the recipient should be able to take-over the responsibility associated with the transferred work as well as achieve satisfactory performance. The last phase, integration, begins after the recipient achieves satisfactory results with the transferred knowledge. It includes activities to remove obstacles and deals with challenges to routinize new practices.

Knowledge transfer in an offshoring context faces many challenges and difficulties (Larsen et al. 2013). The difficulty of knowledge transfer is often linked to the stickiness of knowledge which needs to be transferred and the lack of communication skills in IS teams (Carmel & Tjia 2005; Kogut & Zander 1992). Hence, the successful transfer of knowledge from an onshore to an offshore organization is not easy to achieve (Chen et al. 2013; Huong et al. 2011). The following parts present a review of prior conceptualizations of knowledge transfer processes, involved roles, and success factors in IS offshoring literature. In terms of research approach, interpretive research using case studies dominates the reviewed studies.

2.1 Knowledge transfer processes

Regarding knowledge processes between client and vendor companies, studies propose process models explaining how knowledge is delivered. The interpretive single case study of Feng et al. (2010) analyzes the knowledge delivery lifecycle of a multinational bank and proposes a process model explaining how knowledge is delivered from onshore to offshore teams. This model integrates Carlile (2002)'s framework of knowledge boundary and includes three phases: (1) transfer of syntactic knowledge containing project initiation, knowledge centralization, explicit knowledge impartation, and evaluation of knowledge acquisition to create a common lexicon between onshore and offshore teams and a check whether the explicit knowledge is sufficiently acquired by offshore members. (2) Transform pragmatic knowledge including cross-team interaction, knowledge interpretation and assimilation as well as an evaluation of knowledge assimilation to create a common meaning of the tacit knowledge assimilated by offshore members and a check whether the tacit knowledge is sufficiently assimilated by offshore members. (3) Translate semantic knowledge; by prototyping, interest negotiating as well as knowledge conversion and knowledge application, the

common interests of the applicability of knowledge between onshore and offshore teams are created and sufficiently applied to daily work. In another case study, Chen and McQueen (2010) take the viewpoint of the offshore service provider and examine the knowledge transfer process from an US-based organization to an offshore support center in China. From Lam (2000), they adapt four types of knowledge being transferred (embedded, embodied, embrained, and encoded knowledge) and subdivide (adapting Dreyfus & Dreyfus 1986) four different levels of knowledge (advanced beginner, competence, novice, and proficiency). The authors divide the knowledge transfer process between the US and China into a structured and an unstructured process. The structured knowledge transfer process is based upon Szulanski's (2000) four phases of knowledge transfer and is primarily utilized by novices to gain conceptualization knowledge (i.e., embrained and encoded knowledge). The first initiation stage encompasses the search for qualified knowledge resource people at the client side with the necessary cultural, technical, and business process knowledge. The second implementation phase includes the transfer of product knowledge so that novices can understand the basic concepts required. The third ramp-up phase comprises the transfer of pre-existing knowledge in such order that the knowledge recipient applies the acquired knowledge. The goal of the last integration phase is to get novices qualified to perform the basic functions required. The unstructured knowledge transfer distinguishes three types: unstructured copy, unstructured adaption, and unstructured fusion. The first type is used by advanced beginners to transfer encoded and embodied knowledge to get advanced beginners familiar with common issues and improve their problem-solving skills and speed. The other two types are preferred by recipients at the competence respectively proficiency level to transfer embodied and embedded knowledge to improve problem solving flexibility, efficiency and effectiveness as well as to create new knowledge and to solve tough problems.

In a second publication using the same sample, Chen et al. (2013) develop a model that helps to understand how knowledge is transferred and built at the individual, group, and organizational level. For this purpose, they employ Nonaka's (1994) SECI spiral process which suggests four modes of knowledge conversion (socialization, externalization, combination, and internalization). The individual level focuses on the dynamic interaction between individuals to build up shared experience, articulate their tacit knowledge by using different metaphors, concepts, etc., combine the shared solutions for future reuse, and assimilate and accommodate the transferred knowledge into a knowledge memory. At the group level, the technical and the group leaders expand experiential knowledge and share knowledge amongst groups. Further on they capture and centralize the group knowledge in a knowledge repository and learn as well as apply the new knowledge in their daily work. The organizational level illustrates the dynamic interaction between onshore and offshore organizations. This includes expanding corporate knowledge, advisors' and senior technicians' experiential knowledge, converting organization member's knowledge into a common terminology, standardizing and centralizing best practice solutions as well as converting corporate knowledge through daily practice.

From an organizational learning perspective, Chua and Pan (2008) conduct an interpretive case study investigating how knowledge is transferred for the five IS body of knowledge (BOK) areas (technology, application domain, IS application, organizational, and IS development process knowledge). They present a knowledge transfer process which is subdivided into an organizational level, a team level, as well as an individual level and encompasses four distinct stages – initiation and implementation (taken together), ramp-up, and integration according to Szulanski (2000). At the organizational level, the initiation and implementation stage include the creation of a transition guide and the decision-making about which team to send offshore respectively to decide the percentage of team composition working onshore and offshore. While the ramp-up stage is not applicable, the integration stage encompasses the reorganization into one team to ensure better cohesion. At the team level, the initiation and implementation stage starts with planning a knowledge transfer schedule and content of training (onshore project manager) as well as looking for suitably qualified new recruits

(offshore project manager). The ramp-up stage includes an intensive knowledge transfer through presentations, quizzes, support simulation, and playback. A team's readiness assessment and an audit of the team transition process comprise the integration stage. At the individual level, the initiation and implementation encompasses preparing training material by onshore team members and studying documentations by offshore team members. The ramp-up stage covers an intensive knowledge transfer through presentations, etc. (identical to the ramp-up stage at the team level) while the integration stage comprises oral tests to gauge deeper understanding of features, functions and processes.

Schott (2011) uses a single case-study and examines vendor-vendor knowledge transfer in an IS offshoring project with multiple globally distributed vendors. The goal is to analyze how the knowledge transfer between vendors is performed. She suggests a four stage-model of vendor-vendor knowledge transfer in global information system development projects with multiple vendors: The first stage includes the transfer of the fundamental technological concepts, i.e., detailed presentations of the architectural framework, the underlying theory, and the corresponding design principles. The second stage encompasses the transfer of practical design and implementation knowledge including examples to the particular setting of the project and the individual needs. The third stage is characterized by joint cross-vendor learning based on implementation experiences. An intense involvement of the party involved in knowledge transfer has to take place to ensure individual interactions especially between programmers and technical experts. The fourth stage comprises knowledge multiplication across the global delivery network, which includes transferring knowledge to all developers engaged in the project that could not participate personally in the knowledge transfer activities.

2.2 Roles in knowledge transfer

Previous literature on IS offshoring organizations has pointed out the special role of individuals who gather and translate information from the offshore consumer to the service provider (Hargadon 2003; Pawlowski & Robey 2004). Such roles are called boundary spanner (e.g., Cross & Parker 2004; Friedman & Podolny 1992; Levina & Vaast 2005; Wang et al. 2011), gatekeeper (e.g., Cranefield 2007; Nochur & Allen 1992; Tushman 1977), bridge system engineer (Huong et al. 2011; Min et al. 2010), or middle man (Mahnke et al. 2008; Willcocks & Griffiths 2010). Cross and Parker (2004) describe boundary spanners as individuals who facilitate the sharing of expertise by linking two groups of people that are defined by physical location, hierarchical level, or function affiliation. Levina and Vaast (2005) advance this definition and distinguish between a "nominated boundary spanner" and a "boundary spanner-in-practice". A nominated boundary spanner "refers to agents who were assigned by the empowered agents in a field to perform certain roles in spanning boundaries of diverse fields" (Levina & Vaast 2005, p. 342) while a boundary spanner-in-practice "refers to agents who, with or without nomination, engage in spanning (navigating and negotiating) boundaries of diverse fields" (Levina & Vaast 2005, p. 342). Wang et al. (2011) highlight the role of boundary spanners in an IS offshoring context developing a process model of boundary spanning and role transformation of boundary spanners and objects. In this context, the boundary spanner plays an important role to help organizations navigate and negotiate boundaries and effectively manage the post-implementation of IT strategy.

The gatekeeper role is described as "a high technical performer who connects an organization with outside sources of technology […] [and] is a very effective channel for transferring technical information into an organization from external sources" (Nochur & Allen 1992, p. 265). It is noticeable that the term "gatekeeper" is used similar to the term boundary spanner, describing it as a boundary-spanning individual who monitors external information that may be relevant for an organisation's innovation activities (Cranefield 2007; Katz & Tushman 1981). The roles of a bridge system engineer

and a middle man have similar areas of responsibility, too. The bridge system engineer is supposed to solve communication problems for technological members (Min et al. 2010) respectively to close the communication and cultural gap and thus improving the business relationship between the source and the recipient of the knowledge transfer process (Huong et al. 2011). The middle man provides offshore intermediation capabilities (Mahnke et al. 2008). This role manages internal as well as external teams and relationships.

2.3 Critical knowledge transfer factors

Few empirical studies examine which factors influence knowledge transfer between client and vendor organizations in an IS offshoring context positively or negatively. Williams (2011) determines that client-vendor knowledge transfer is positively associated with formal training and client embedment. Deng and Mao (2012) indicate that knowledge articulation is more important than interaction experience in knowledge transfer. In addition, they argue that clients' support to their vendor and its learning mechanisms have a positive impact on the transfer of knowledge. Furthermore, Smite and Wohlin (2011) argue that the receiving side's readiness to take over the responsibility and the avoidance of rushed and ad hoc execution facilitates knowledge transfer. Beyond this, Gregory et al. (2009) examine managerial mechanisms for effective knowledge transfer. The results indicate that stimulating motivation of client members to share knowledge and collaborate with the provider as well as finding the right balance between formal and informal techniques facilitate knowledge transfer.

Huong et al. (2011) argue that good impressions and willingness to cooperate facilitate knowledge transfer, while communication barriers, cultural differences, lack of equivalence in individual competence, and lack of common rules hinder it. Further factors negatively impacting knowledge transfer have been examined by Betz et al. (2014) as well as Wende et al. (2013). Betz et al. (2014) results indicate that the lack of transparency regarding to what knowledge is available and where, the missing backflow of knowledge, the unwillingness and disability to share knowledge, strong data protection laws in western countries, difficulties maintaining informal networks, latency time using IT and media, difficulties in knowledge cooperation as well as hidden (extra) costs influence knowledge transfer negatively. The findings of Wende et al. (2013) show six key factors slowing down knowledge transfer: lack of communication and cooperation competency, using usual media mix without any adaptation to the project context by the client, little background or business knowledge at the provider side, the challenge to address knowledge gaps in the midst of the project and to ask questions which would unveil a lack of technical knowledge as well as only following instructions and not using their initiative or experience to achieve positive results.

Only one study by Schott (2011) identifies factors influencing knowledge transfer between multiple globally distributed vendors. The results indicate that knowledge receivers' levels of knowledge and knowledge receivers' mindsets, the structure of the knowledge being transferred, and organizational characteristics influence the inter-organizational knowledge transfer between vendors positively.

3 CONCEPTUALIZATION

The previously described studies examined knowledge transfer processes, the roles involved as well as influencing factors for knowledge transfer in IS offshoring initiatives. The results indicate distinct similarities but also apparent differences. In the subsequent section, we develop a new conceptual framework in order to provide a holistic and consolidated perspective on this research field. This conceptualization includes a generic knowledge transfer process, a general role to facilitate the process as well as the core factors influencing success or failure of knowledge transfer.

3.1 Generic knowledge transfer process in IS offshoring

The studies of Chen and McQueen (2010) as well as Chua and Pan (2008) are based on Szulanski (2000)'s process model and develop their findings along Szulanski's stages initiation, implementation, ramp-up, and integration. In addition Szulanski's model describes factors that are expected to correlate with difficulty at different stages of transfer. Feng et al. (2010) integrate Carlile (2002)'s framework of knowledge boundary for their knowledge delivery lifecycle. This framework describes how knowledge is structured by focusing on the objects and ends used in a given practice. Schott (2011) adopts a theoretical framework of inter-organizational knowledge transfer from the general management domain to provide a stage-model of vendor-vendor knowledge transfer. Finally, Chen et al. (2013) employ Nonaka's (1994) SECI spiral process to develop a knowledge transfer and knowledge building process. The central theme of the SECI model hinges on a dynamic interaction between the different modes of knowledge conversion supporting the creation of new knowledge.

These studies are based on different theory-constructs to describe how different types of knowledge were transferred from onshore to offshore organizations respectively between vendor organizations and how knowledge was built at the offshore organizations. Figure 1 presents a new generic knowledge transfer process in the context of IS offshoring, which is based on Szulanski (2000)'s process model and integrates the findings of the aforementioned studies. We decide to build upon Szulanski's model, because it is proven and well suited to serve as a starting point to develop a knowledge transfer process in the IS offshoring context. The milestones mark the beginning or end of a phase.

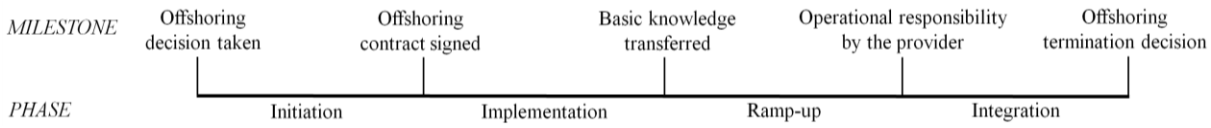

Figure 1. Knowledge transfer process in IS offshoring

Initiation: The initiation stage starts with the decision to offshore IS functions to an organization. In this stage the onshore organization searches for a suitable offshore service provider (OSP). This stage is not concerned with knowledge transfer itself. It is rather associated with preparatory activities including all events that lead to the decision to contract with a specific OSP. Once a provider with the necessary cultural, technical, and business process knowledge is found, an offshoring contract is signed and the second stage of implementation begins.

Implementation: At the beginning it is useful to plan steps for the whole delivery process as well as to establish a detailed sequencing of activities. In addition, this plan also includes the areas of knowledge to be transferred as well as the identified onshore team members who prepare the material and do the

training. The goal of the implementation stage is to transfer explicit knowledge and to create a common lexicon between onshore and offshore teams. The transferred explicit knowledge is formal, abstract, or theoretical and depends on the individuals' conceptual skills as well as their cognitive abilities. In addition, explicit knowledge is codified and stored, e.g., in blueprints, recipes, written rules, manuals, or procedures. Knowledge centralization ensures that all participants get access to appropriated knowledge. At this stage, trainers from the onshore team can provide face-to-face classroom-based training to transfer basic concepts, organization rules, etc. using techniques such as presentations, case studies, role plays, real call listenings, lab experiments, support simulations, playback, written tests, and quizzes. The last mentioned method can particularly be used to evaluate whether the explicit knowledge delivered is sufficiently acquired by offshore team members.

Ramp-up: Once basic knowledge is provided, knowledge recipients at the offshore side apply the acquired knowledge to operational work. Onshore team members provide support and take the responsibility for coaching offshore team members. Knowledge transferred at this stage is characterized by explicit knowledge that has been codified as well as tacit knowledge which is action oriented and builds upon practical experience. The explicit and tacit knowledge is used primarily for support simulation and solving operational problems in application. In support simulation, offshore members situate themselves in past problematic conditions and try to learn from onshore members' experiences in problem solving. In addition, organizational knowledge repositories play a critical role within the ramp-up stage in transferring best practices. These repositories include successful solutions, and make them available for solving the problem in question. The access to these expert problem solutions enables offshore team members to be more inquisitive for knowledge. Furthermore, onshore team members provide on-the-job-training and playback sessions to exchange and coordinate their interpretations for the jobs. These trainings or sessions facilitate the creation of a common meaning of tacit knowledge assimilated by offshore members. An evaluation of knowledge assimilation ensures that the knowledge delivered is sufficiently assimilated by the offshore member. A passed user acceptance test or a team readiness assessment proves that the offshore team members are ready to take over full operational responsibility.

Integration: The offshore team members start to work independently within their scope and apply what they learned to their daily job. The onshore team members support as necessary and supervise offshore team members. At this stage, explicit and tacit knowledge was transferred to get the offshore team members qualified to perform the services required. The applied techniques in this stage consist of monitoring and quality auditing. In monitoring, onshore team members supervise offshore teams in handling daily work processes and provide support. Oral tests may be used to gauge deeper understanding of features, functions, and processes and to verify if the offshore team has indeed absorbed the knowledge. Quality auditing is an ongoing assessment process carried out by the quality auditor to check daily work practices, give feedback, and to provide one-on-one coaching to overcome offshore team members weaknesses. Finally, the coherence between onshore and offshore teams should be facilitated to establish a cohesive team with members trusting each other despite being located in different geographical areas. These actions enable both teams to work together as well as to share knowledge and experiences in order to solve problems together in the future.

The main characteristics described are summarizes in Figure 2.

Phase	Initiation	Implementation	Ramp-up	Integration
Relevance to knowledge transfer	Low	High	High	Medium
Primary types of knowledge in focus	n/a	Explicit	Explicit and implicit	Implicit
Main activities	Finding qualified knowledge resource people	Codification, storage and centralization of knowledge	Applying knowledge and learn from experiences	Perform the services required with little support
Methods for transfer and testing	n/a	Presentations, case studies, role plays, real call listening, lab experiments, support simulations, playback, written tests, quizzes	Support simulations, using organizational knowledge repositories, on-job-training, playback sessions	Monitoring and quality auditing, oral tests, team readiness assessments
Aim	Identify	Learn	Apply	Operate

Figure 2. Overview of the knowledge transfer characteristics along proposed IS offshoring knowledge transfer process

3.2 Knowledge transfer roles in IS offshoring

The identified roles of a boundary spanner (Cross & Parker 2004), bridge system engineer (Huong et al. 2011), gate keeper (Katz & Tushman 1981), or middle man (Mahnke et al. 2008) have a similar area of responsibility in an IS offshoring context. They connect the onshore and offshore organization and facilitate the knowledge transfer processes. Several studies confirm that such individuals have to perform multiple activities (Cranefield 2007; Levina & Vaast 2005; Pawlowski & Robey 2004) and are critical for an effective offshoring initiative (e.g., Huong et al. 2011; Wang et al. 2011; Willcocks & Griffiths 2010). Nevertheless, research findings with regard to tasks and skills required for such roles are diverse. We aggregate the research findings into a general role which we label "offshore coordinator". Table 1 summarizes the core tasks of an offshore coordinator and presents the skills necessary to perform this role.

Tasks	Skills
Coordinate both teams	Communication skills
Cultivate and intensify the relationship	Distinctive skills and attributes
Eliminate the lack of equivalence	Higher education
Fill cultural gaps	IT-Skills
Overcome communication barriers	Work experience

Table 1. Main tasks and skills of an offshore coordinator

The offshore coordinator is positioned between the offshore and the onshore side. One main task consists of coordinating both teams. This includes all activities that ensure information exchange and building of communication networks, in particular during the early stage of the knowledge transfer implementation phase (cf. Figure 1, p. 6). Furthermore, the offshore coordinator mediates and enhances the business relationship. Both teams have to work collaboratively on a partnership basis

along the knowledge transfer process. For example, the offshore coordinator facilitates building of mutual trust and provides support to cultivate relationship. Moreover, the lack of equivalence, communication barriers, and cultural differences as well as any other problems during cooperation impact the transfer process in a negative way. By improving individual capacity, the offshore coordinator decreases the lack of equivalence in individual competences such as IT skills. Finally, communication barriers occur in particular when two organizations come from different countries without common language. The offshore coordinator removes such communication barriers and improves mutual understanding between the participants thus filling cultural gaps.

In order to succeed in their tasks, offshore coordinators need certain skills. First of all, strong interpersonal and communication skills are essential to facilitate the communication-intensive knowledge transfer process which is characterized by misunderstandings. Furthermore, the offshore coordinator needs distinctive skills and attributes to perform multiple dimensions, e.g., leader, business systems thinker, contract facilitator, or translator, and interpreter (Cranefield 2007; Willcocks & Griffiths 2010). IT-skills are required due to the IT context of the endeavor itself. Finally, a background of higher education and several years of work experience are necessary to effectively fulfill this demanding role.

3.3 Critical knowledge transfer factors in IS offshoring

The factors which influence knowledge transfer between client and vendor positively can be divided into key preconditions for sharing knowledge as well as utilizing techniques that are used to facilitate the knowledge transfer process positively. The key constructs clustered by their focus are illustrated in Table 2. In addition, the last column of the table indicates whether the respective study provides qualitative (Qual) or quantitative (Quan) empirical evidence for its findings.

Focus	Construct	Reference	Evidence
Key conditions	Client support	Deng & Mao 2012	Quan
	Willingness to invest in knowledge articulation		
	Good impressions	Huong et al. 2011	Qual
	Willingness to participate and cooperate		
	Readiness to take over the responsibility	Smite & Wohlin 2011	Qual
Utilizing techniques	Codified knowledge through formal training	Williams 2011	Quan
	Tacit knowledge through embedment within the client		
	Learning mechanism	Deng & Mao 2012	Quan
	Right balance between formal and informal techniques	Gregory et al. 2009	Qual
	Stimulating motivation to share knowledge and collaborate it		
	Sufficient planning and careful performing	Smite & Wohlin 2011	Qual

Table 2. Factors influencing knowledge transfer positively

Few prerequisites must be fulfilled before knowledge transfer can occur effectively. First of all, effective knowledge transfer cannot occur without the support from the knowledge source as well as its willingness to invest in knowledge articulation. Both of these are important factors in promoting vendors' learning motivation by sending a signal of credibility and willingness to cooperate (Deng & Mao 2012). This is also confirmed by Huong et al. (2011) with the addition that good impressions motivate the knowledge transfer process, too. Good impressions are derived from national, cultural similarities, regarding economic strength, or favourable preconceptions about the respective team. Finally, transfer readiness has to be evaluated. The receiving site's readiness to take over the responsibility is another prerequisite for effective knowledge transfer (Smite & Wohlin 2011).

However, sufficient planning and progressing carefully to avoid rushed and ad hoc execution facilitate knowledge transfer processes in a positive way (Smite & Wohlin 2011). This is especially true in the early stages of initiation and implementation (cf. Figure 2, p. 8). During the implementation and ramp-up phase, explicit and tacit knowledge is transferred. According to Williams (2011), the understanding of the client is positively influenced by exposure to codified knowledge through formal training and by exposure of tacit knowledge through embedment within the client. In addition, using techniques to stimulate intrinsic and extrinsic motivations to share knowledge as well as finding the right balance between formal and informal techniques is critical in this phases of knowledge transfer (Gregory et al. 2009). In the last integration stage it is verified whether the learning mechanism worked. They are important to stimulate knowledge transfer (Deng & Mao 2012). In contrast, there are factors which influence knowledge transfer negatively. These factors can be distinguished between aspects related to capabilities, cooperation and strategy, culture and mentality, external influences, and management (cf. Table 3).

Focus	Construct	Reference	Evidence
Capabilities	Lack of communication and cooperation competency	Wende et al. 2013	Qual
	Little background or business knowledge at provider side		
Cooperation and strategy	Difficulties in knowledge cooperation	Betz et al. 2014	Qual
	Difficulty maintaining of informal networks		
	Latency time using IT and media		
	Missing backflow of knowledge		
	Unwillingness and disability to share knowledge		
	Communication barriers	Huong et al. 2011	Qual
	Lack of equivalence in individual competence		
Culture and mentality	Challenging to address knowledge gaps in the midst of the project and to ask questions which would unveil a lack of technical knowledge	Wende et al. 2013	Qual
	Only following instructions and not using their initiative or experience to achieve positive results	Wende et al. 2013	Qual
	Cultural differences	Huong et al. 2011	Qual

Focus	Construct	Reference	Evidence
External influences	Strong data protection laws in western countries	Betz et al. 2014	Qual
Management	Hidden (extra) costs	Betz et al. 2014	Qual
	Lack of transparency regarding to what knowledge is available and where		
	Lack of common rules	Huong et al. 2011	Qual
	Using usual media mix without any adaptation to the project context by the client	Wende et al. 2013	Qual

Table 3. Factors influencing knowledge transfer negatively

The factors with respect to capabilities, cooperation, as well as culture and mentality concern in particular the stages implementation and ramp-up (cf. Figure 2, p. 8). During these stages, frequent exchanges take place between both teams. Negative effects on the transfer of knowledge arise from insufficiently qualified personnel with lack of communication and cooperation competencies as well as little background or business knowledge (Wende et al. 2013). Furthermore, difficulties in collaborative work impact knowledge transfer in a negative way. These difficulties are due to communication barriers and lack of equivalence in individual competencies (Huong et al. 2011). In addition, difficulties arise, inter alia, from unwillingness and disability to share knowledge and missing backflow of knowledge (Betz et al. 2014). Beyond this, cultural differences affect the sharing of knowledge negatively (Huong et al. 2011). These include attitudes and behavior, i.e., challenges to address knowledge gaps in the midst of a project and to ask questions which would unveil a lack of technical knowledge as well as just following instructions and not showing individual initiative or contributing personal experience to achieve positive results (Wende et al. 2013).

Further influencing factors have negative effects on all phases of the knowledge transfer process. These are factors related to external influences and management aspects. Strong data protection laws in western countries may cause problems and impact, for example, joint tests of software and systems (Betz et al. 2014). In addition, management related aspects influence knowledge transfer in a negative way. These are a lack of common rules (Huong et al. 2011) and a lack of transparency regarding to what knowledge is available and where (Betz et al. 2014) as well as a lack of adaption to the project context using media by the client (Wende et al. 2013).

4 CONCLUSIONS AND FURTHER RESEARCH

The literature about knowledge transfer in an IS offshoring context is characterized by diverse and heterogeneous research findings. Covering the last fifteen years of IS offshoring research regarding knowledge transfer processes, roles as well as success and failure factors, the aim of this paper is to provide a consolidated view of the field of study and to integrate it within a conceptual framework. This research makes three main contributions to the IS offshoring body of knowledge. Firstly, we conceptualize a generic knowledge transfer process which consists of four phases and includes five milestones. In addition, we describe the main characteristics of each stage and summarize it. This process helps us to understand knowledge transfer phases and forms the foundation for more detailed research in the future. Secondly, research has found differently named individuals involved in knowledge transfer. We aggregate these findings and develop a general role which we label "offshore coordinator". Moreover, the core tasks of an offshore coordinator and main skills which are necessary to perform this role are presented. Thirdly, we identify and characterize core factors which influence success or failure of the knowledge transfer process between client and vendor. In summary, our study offers a contribution for theory-based conceptualization in the IS offshoring research field.

In reference to these results, several opportunities for future research become apparent. Due to the fact that our work has been conceptual so far, we consider qualitative interviews to be an interesting research opportunity to further investigate and develop the depicted concepts. More precisely, future studies could build on our generic knowledge transfer process and examine characteristics of this process in greater detail. Further on, there is a paucity of work devoted to knowledge delivery from vendors' perspectives and still a research gap regarding knowledge transfer between vendor companies (e.g., Bapna et al. 2010; Dibbern et al. 2008; Modi & Mabert 2007; Schott 2011). Thus, it is important to explore the vendors´ perspective and how knowledge is effectively delivered between vendors in detail. In addition, little is known about organizational roles involved in the knowledge transfer process. These roles are supposed to be critical to the success or failure of the offshoring process because they are able to affect the relationship between client and service provider. The general offshoring coordinator role as well as the resulting tasks and skills could form a starting point for future studies. Such studies could either qualitatively or quantitatively empirically verify and validate our findings to have a clearer view of the resulting tasks and skills of an offshoring coordinator and its effect on knowledge transfer. Further on, future studies could assign the tasks and responsibilities of this role to the activities of the individual knowledge transfer process steps. Finally, it would be promising to quantitatively investigate success and failure factors of knowledge transfer in the IS offshoring context.

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