KAIWA: A design framework for knowledge discourse in the transition phase of offshore outsourced projects

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Abstract: The challenge of knowledge transfer in distributed team settings is often underestimated and ineffective or failed knowledge transfer is a major cause of project delay or failure. Globally distributed teams can face difficulties overcoming the challenges of physical and cultural distance and can struggle to develop systems that support the effective identification andtransfer of knowledge that is critical to project success. In the case of offshore outsourced software development, the commonly ad-hoc nature of project teams compounds thesechallenges, since team members are often unknown to each other ahead of projectcommencement.Despite knowledge transfer being recognized simultaneously as critical and problematic, theliterature provides little guidance for developing solutions. This paper builds on existing research into the problem of ineffective or failed knowledge transfer in the transition phase of offshore outsourced software development projects. Following a Design Science Research approach, we seek to establish design elements, including an instantiation of a method structure, which will provide a sound basis from which to develop a method for knowledgetransfer in globally distributed projects.

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Keywords knowledge transfer, transition phase, design science

ABSTRACT

The challenge of knowledge transfer in distributed team settings is often underestimated and ineffective or failed knowledge transfer is a major cause of project delay or failure. Globally distributed teams can face difficulties overcoming the challenges of physical and cultural distance and can struggle to develop systems that support the effective identification and transfer of knowledge that is critical to project success. In the case of offshore outsourced software development, the commonly ad-hoc nature of project teams compounds these challenges, since team members are often unknown to each other ahead of project commencement.

Despite knowledge transfer being recognized simultaneously as critical and problematic, the literature provides little guidance for developing solutions. This paper builds on existing research into the problem of ineffective or failed knowledge transfer in the transition phase of offshore outsourced software development projects. Following a Design Science Research approach, we seek to establish design elements, including an instantiation of a method structure, which will provide a sound basis from which to develop a method for knowledge transfer in globally distributed projects.

INTRODUCTION

The transition phase of an IT offshore outsourced project is considered to be the most critical phase for overall success (Beulen et al. 2009; Carmel and Tija 2005; Tiwari 2009). Transition includes the first joint operational steps amid the uncertainty that follows pre-execution and contract signing and involves the critical, but time-constrained knowledge transfer, as illustrated in figure 1 {Lacity, 2009 #1268}. The purpose of knowledge transfer in outsourcing situations is the conveyance of information from client to service provider (SP) that the service provider needs in order to deliver its services. Ineffective or failed knowledge transfer early in projects is a common reason for offshore outsourced software development (OOSD) projects experiencing difficulties, delays or failure (Chua and Pan 2008; Rottman 2007). The goal of this research is to establish design elements from which to develop a solution for improving the transfer of knowledge from client to service provider that is critical to the success of globally outsourced projects.

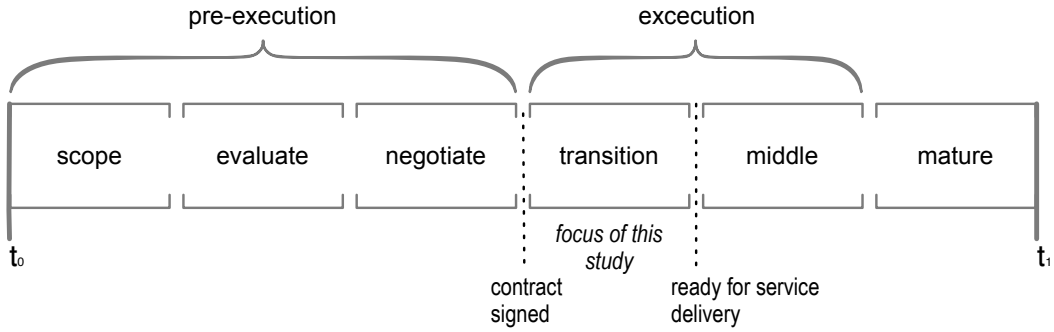

Figure 1 Outsourcing relationship lifecycle (adapted from Lacity 2009)

We address this goal through investigating knowledge transfer in the transition phase of offshore outsourced software development (OOSD) projects. Software development depends on knowledge transfer, acquisition, information sharing and integration, and the minimization of communication breakdown (Walz et al. 1993). It is a knowledge-intensive process and has challenging information demands, requiring operators to have in-depth knowledge and expertise in applying that knowledge. It requires implicit and explicit knowledge, general and contextual knowledge (Markus et al. 2002). Explicit knowledge may be successfully transferred in the form of documentation and data, whereas implicit knowledge is generally more difficult to articulate and more challenging to transfer (Blumenberg et al. 2009; Nonaka 1994), requiring interactivity between communication partners to support an on-going process of sense making. With respect to implicit knowledge particularly, the success of knowledge transfer is moderated by the quality of the relationship between group members (Vlaar et al. 2008). If knowledge recipient and source do not have a trusting relationship (Robert et al.

2009), the willingness to transfer background information and implicit knowledge is inhibited (Chow and Chan 2008), thereby hindering the acquisition of knowledge.

Establishing effective team relationships and successful communication can be challenging in the context of OOSD, since it typically involves ad-hoc project teams that do not share a national or corporate culture. The size of participant organizations on both sides of the offshoring process is trending downwards, with more SMEs entering the field (Richardson et al. 2008), which are less likely to have established boundary spanning capacity than larger enterprises. Furthermore, unlike some other remote sourcing models, or other IT related projects (Krancher and Dibbern 2012), it is rare in OOSD for there to be any on-site placement during the knowledge transfer process. Operational (i.e. non-managerial) staff generally do not meet their offshore partners face-to-face at any stage in the project cycle but interact via communications media only, which is known to slow the development of relationships (Olson and Olson 2013) and effective communication between team members.

Cultural and experiential differences between client and service provider, as well as differing organizational practices, often results in discrepancies in levels of project relevant knowledge. Cultural difference between client and service provider is recognized as a common cause of communication difficulties and can present significant problems to the development process (Dibbern et al. 2008; Liukkunen et al. 2010). In particular, globally distributed teams often face difficulties developing systems that support the transfer of contextual and implicit knowledge (Oshri et al. 2008).

The existing research literature provides little guidance or understanding that assists project managers in setting up and managing knowledge transfer in the transition phase of OOSD (Beulen et al. 2009). Furthermore, there is a lack of guidance on how to foster relationships in intercultural virtual work teams, such as partners in offshore outsourced projects.

This study fulfills part of a larger research project, which seeks to develop and test a method for knowledge transfer in the transition phase of globally distributed projects. Adopting a Design Science Research (DSR) approach, this paper builds on existing research (Wende et al. 2013) by establishing design elements, including an instantiation of a phase structure, for a knowledge transfer methodology.

In conceiving a solution, we focus particularly on the client – service provider relationship, which is fundamental to effective knowledge transfer (Jarvenpaa and Keating 2011). Recognizing that the client contracts the service provider, and initiates and owns the project, we frame the offshore outsourcing relationship, and transition set-up, primarily from the perspective of the client.

METHODOLOGY

Over recent years DSR has become an established method for producing artifacts in the form of constructs, models, methods or instantiations, which deliver a solution to an important and relevant business problem (Hevner et al. 2004). The DSR process includes six stages: problem identification and motivation, definition of objectives for a solution, design and development, demonstration, evaluation, and communication (Peffers et al. 2008).
This study builds on existing research, which addressed the first stage of the DSR process (problem identification) by investigating the issue of ineffective and failed knowledge transfer in OOSD. More specifically, the research sought to investigate the question of why clients fail to effectively transfer that knowledge which is critical for the service provider to successfully complete its work. In this paper, we address the second stage of the DSR process, through defining objectives of a solution to ineffective and failed transfer and completing preliminary design and development of a solution. The aim of the wider research project, of which this study is part, is to establish a method, which is a practical solution for knowledge transfer in globally distributed projects. In this paper, we seek to establish design elements that provide the basis for developing a solution, specifically solution objectives, design requirements and an instantiation of a method structure (see figure 2).

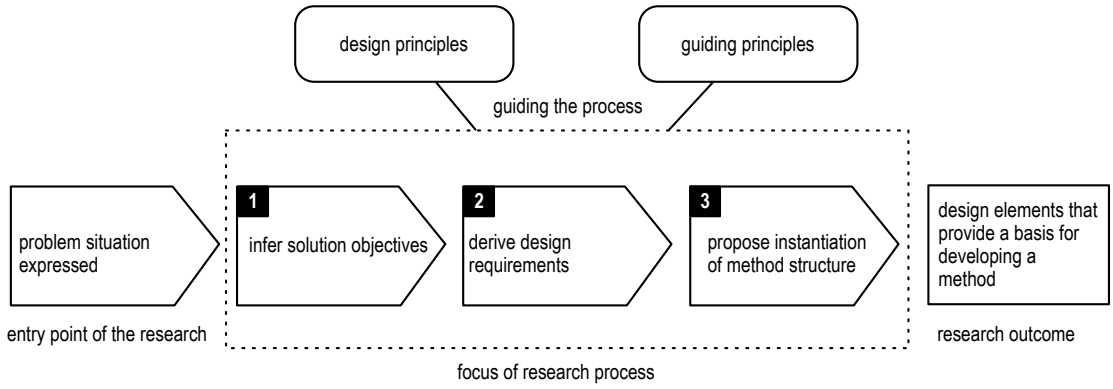

Figure 2 Research process

To guide us in conceiving and developing the design elements, we define two design principles, which respond to the question *'How should the artifact be designed?'*
Commonly in OOSD projects, primary responsibility for assuring successful knowledge transfer sits with the SP itself, with the client providing a project specification and advising sources of knowledge for the SP to analyze in order to gain the knowledge needed for the project. We contend that this passive approach to knowledge transfer from the client is an important contributor to the problem of ineffective or failed knowledge transfer. It is recognized that a project manager can have a positive influence on establishing effective communication through adopting instruments of control and motivation (Foss and Pedersen 2002). It is the

client that initiates the project, defines the terms and signs the contract. Furthermore, in many instances, it is the client that ultimately benefits most from successful project outcomes. We contend it follows that projects would benefit from the client project manager taking a pro-active approach to assuring effective knowledge transfer and we define the first design principle: Design from the client's perspective.

The second design principle is defined with respect to the ultimate aim of the wider research project (to establish a method for knowledge transfer in globally projects). A method only has utility value if it is practicable and can be readily adopted by users (Braun et al. 2005). A method that is inconvenient or difficult to implement is unlikely to become standard practice and will thereby fail to produce the intended outcomes. We define the second design principle: The method should be easy to adopt and use.

PROBLEM SITUATION – FAILED AND INEFFECTIVE KNOWLEDGE TRANSFER IN GLOBALLY DISTRIBUTED SOFTWARE PROJECTS

The success of knowledge transfer is defined by the ability of knowledge recipients to use what was learned to solve new problems, answer new questions, or facilitate learning new subject matter (Mayer and Wittrock 1996). The challenge of knowledge transfer in distributed team settings (Argote and Ingram 2000; Szulanski 1996) is often underestimated (Dibbern et al. 2008) and is a major cause of project delay or failure. From existing research and literature analysis we delineate five problems of knowledge transfer in OOSD, which are summarized here.

(P1) Clients fail to adapt to the context

Whilst knowledge transfer within units located in the same country can be challenging, that challenge increases with geographical and cultural distance (Bresman et al. 1999). Transferring knowledge across cultural and semantic distances increases the likelihood of miscommunication and misinterpretation of messages, which can inhibit knowledge uptake (Chua and Pan 2008). Clients often fail to accommodate or adequately plan for the influence of cultural (Kaiser and Hawk 2004; Powell et al. 2004) and experiential differences between local and offshore team members on knowledge transfer (Goles et al. 2008). Existing research (Wende et al. 2013) has found that clients attempt to manage the knowledge transfer process in OOSD projects in much the same way that they would manage a locally sourced project, thereby not recognizing the potential need to adapt communications choices and media selection with respect to contextual issues, such as suiting the communication capabilities within the team.

(P2) Poor communication and team cohesiveness

Cultural differences between client and SP can also impact on the quality and frequency of communication in OOSD, particularly if the client does not take these differences into consideration adequately when determining communication actions and interaction patterns. For example, commencing a project and seeking to transfer project information via a rich, synchronous form of interaction, such as video conference, may work well with a culturally homogenous group, but may result in communication breakdown (Wende et al. 2013) or information overload (Krancher and Dibbern 2012) within a diverse team.

Low levels of interaction between client and SP are at the root of knowledge transfer problems in OOSD, resulting in poor team cohesiveness. It is often the case that operational staff on the SP side have limited involvement, with communication being controlled by or mediated through project managers (Wende et al. 2013). These types of communication restriction reflect cultural differences between client and supplier, and in particular the influence of strong organizational hierarchies that are typical in supplier countries such as India. This lack of regular interaction with clients can result in operational team members having poor communication and collaboration skills. Furthermore, with the commonly ad-hoc nature of OOSD teams, clients often do not know about the offshore team members' communication skills ahead of project commencement (Wende et al. 2013).

(P3) Success critical knowledge is not transferred.

The overriding problem of failed or ineffective knowledge transfer in OOSD is that the knowledge transfer process fails to result in the service provider gaining the knowledge that it needs to fulfill its tasks effectively. This sometimes stems from clients failing to identify what knowledge is critical to the project, and in particular not recognizing the importance of implicit as well as explicit knowledge (Wende et al. 2013). In addition, differences in interpretation can often result in explicit knowledge not being transferred effectively.

(P4) Clients lack control and are not aware of the status of knowledge transfer.

An outcome of poor communication and low levels of interaction between team members can be that the client is largely in the dark as regards the status of knowledge transfer and the acquisition of knowledge by the SP team. Clients often lack a reliable means of monitoring the knowledge transfer process in order to gauge whether the SP is successfully gaining the knowledge needed to complete the work (Wende et al. 2013).

(P5) SP developers do not meet client expectations in terms of background and technical knowledge.

As well as in respect of communication capabilities, SP developers often do not meet client expectations in terms of background and technical knowledge (Wende et al. 2013). This problem reflects both the ad-hoc nature of OOSD teams, in which the client often has minimal information about the SP team members before project commencement. Low levels of interaction between client and service provider can result in gaps in background and technical knowledge not being identified until well into the knowledge transfer process or in a subsequent project stage (Wende et al. 2013), potentially causing difficulties in the development process.

RELATED CONCEPTS AND GUIDING PRINCIPLES

In this section we describe related concepts from the literature and delineate guiding principles for the solution. Guiding principles answer the question, *what are the key concepts that should influence development of the artifact?* They are established principles that we contend are fundamentally important to the conception of the design elements.

With a complex problem solving activity like software development, projects generally entail a high degree of ambiguity and uncertainty (Davidson 2002). As such, implicit knowledge is often considered at least as important as explicit knowledge for successful task performance (Spohrer et al. 2012) (Hsu et al. 2012). By definition, implicit knowledge is not directly expressed or not readily apparent. Although it may be critical to project success, the hidden nature of implicit knowledge not only makes it difficult for the client to transfer, but also difficult to know *what* to transfer. Furthermore, in practice, the distinction between (and interrelation of) implicit and explicit knowledge is blurred and difficult to define, since even explicit knowledge must rely on being tacitly understood and applied (Polanyi 1966). The incompatibilities and incongruence of knowledge may only come to light as it is put to use by the recipient (Argote et al. 2000). Knowledge, which has been codified by a source, may be incompatible with a recipient's beliefs, experiences or practices. As a result, such knowledge could lack legitimacy in the recipient's context, and the recipient may be less motivated to take ownership of, and become committed to, this knowledge (Cummings and Teng 2003).

Cummings (2003) identifies the phenomena that influence knowledge transfer in distributed work settings, which include the nature of knowledge itself, in terms of the level of 'articulability' and embeddedness (Cummings and Teng 2003). Cummings' model also highlights the relevance of differences between knowledge source and recipient, in terms of contextual discontinuities and distance (organizational, physical, knowledge and norm) for knowledge transfer.

We define the first guiding principle: *The duality of knowledge.* This reflects the importance of implicit as well as explicit knowledge.

The physical distance between individuals in distributed teams mean that members can only interact via communications media. It is widely agreed that for such teams, the ongoing selection of communication medium channels (media selection) is of crucial importance for effective task performance (Staples and Jarvenpaa 2000). There is a large body of research on media selection in collaborative work environments, and several common theories (egDaft et al. 1987; Dennis et al. 2008) that address the question of matching the capabilities of media to the communication context in order to optimize the conveyance of information and the development of shared meaning (or convergence) within teams.

The complex nature of OOSD, combined with physical and cultural distance between team members means that there is a high risk of misunderstanding and misinterpretation, and the exchange of documents is generally insufficient for successful knowledge transfer (Davidson 2002). Key aspects of knowledge transfer, such as requirements determination, are characterized by ongoing sense making among stakeholders, and it can be chaotic, nonlinear and continuous (Curtis et al. 1988; Walz et al. 1993). Successful knowledge transfer requires interactivity between knowledge source and recipient in the form of effective knowledge discourse (Wende et al. 2013), involving back-and-forth questioning and answering, in order to uncover and address any knowledge gaps or misunderstandings.

The concept of 'transactive memory' provides further insight for understanding how knowledge needs can be identified and addressed in a group. A Transactive Memory System (TMS) is a system through which groups collectively encode, store, and retrieve knowledge (Wegner 1987), which is based on individuals establishing an understanding of 'who knows what' within the team. The development of an effective TMS is dependent on the establishment of relationships between actors and, as Wegner's work indicates, that the quality of TMS correlates with the strength of social relationships. Other researchers cite the importance of relationships between team members, indicating that the quality and performance of implicit knowledge transfer is highly dependent on the level of trust and the quality of relationship between the source and recipient (Griffith et al. 2003; Szulanski 1996). If knowledge recipient and source do not have a trusting relationship (Robert et al. 2009), the willingness to transfer background information and implicit knowledge is inhibited (Chow and Chan 2008), thereby hindering the acquisition of success critical knowledge and the development of a TMS.

Teams can develop effective TMS in conditions that are far removed from the origins of TMS theory that dealt with the distribution of expertise in American intimate couples. TMS can

emerge even when team members are in dispersed settings and have no prior experience working together (Jarvenpaa and Keating 2011), assuming that the team can establish strong communication ties resulting from frequent, intense, reciprocal, and personal interactions (Yuan et al. 2010). We define the second guiding principle: *The sociality of knowledge.* This reflects the socially embedded nature of knowledge and that complex knowledge needs can only be identified and resolved through social interaction.

As noted, cultural difference between client and service provider has a significant impact on achieving the kind of social interaction needed to successfully transfer complex knowledge. Cultural compatibility between individuals is often described as an important factor in determining the success of international software development teams (Gallivan and Srite 2005). The work of Dubé (2001) and Diamant (2009) found that team members with different cultural backgrounds can have differing communication styles (Dubé and Paré 2001) and can have contrasting ways of conveying information (Diamant et al. 2009). This can lead to team members struggling with cross-cultural communication, as they have not considered cultural differences nor the potential impact on the team's performance (Powell et al. 2004). Considering this and the often large amount of knowledge that has to be transferred in a relatively short time it is not surprising that information overload is a common problem (Krancher and Dibbern 2012) and can contribute to communication breaking down or never being effectively established in the first place (Wende et al. 2013).

A number of other researchers have investigated intercultural virtual teams (Dibbern et al. 2008; Gallivan and Srite 2005; Krishna et al. 2004; Walsham 2002; Whitaker et al. 2011) and they suggest that the cultural approach in IT research needs to take a broader view of culture. Culture should not be considered as just a single influencing variable but rather as a set of variables that influence a project on multiple levels. This approach to understanding culture sees many different layers, including national, organizational, professional groups, and individuals. These are seen as being intertwined in a complex, non-hierarchical way (Gallivan and Srite 2005; Karahanna et al. 2005).

TOWARDS A DESIGN FRAMEWORK FOR KNOWLEDGE TRANSFER

We begin the process of developing design elements by defining the goal orientation for the solution, then proposing design requirements, which will allow us to suggest an instantiation of a phase structure for the prospective method.

The overarching goal of this research, which motivates development of the design elements, is: *to improve the transfer of knowledge from client to service provider that is critical to the success of globally outsourced projects.*

Solution objectives

To complement this overarching goal, and to provide criteria to measure the success of the solution against, we infer specific solution objectives for the method, which relate directly to our understanding of the problem of ineffective or failed knowledge transfer in OOSD. In design research endeavors, solution objectives relate to the question of what a better artifact would accomplish [Peffers et al. 2007:54]. From the atomized problem situation we infer four solution objectives (SOs).

In response to P1 (Clients fail to adapt to the context) we infer the solution objective:

SO1. Increase responsiveness to the communication context and individual capabilities.

This solution objective also contributes to addressing the problem of poor communication and team cohesiveness (P2), in the sense that implementing measures to improve communication and team cohesiveness requires taking into account contextual issues such as cultural difference and the communication capabilities of team members.

In response to P2 (Poor communication and team cohesiveness), and influenced by the second guiding principle (the sociality of knowledge) we infer the solution objective:

SO2. Increase participation of SP team and improve team cohesiveness.

This solution objective also responds to the problem of SP developers not meeting client expectations in terms of background and technical knowledge (P5), in the sense that increasing the level of contact between SP team members (including developers) and the client would support identification of SP knowledge gaps earlier in the knowledge transfer process.

In response to P3 (Success critical knowledge is not transferred) we infer the solution objective:

SO3. Improve identification of knowledge need and uptake of success critical knowledge by the SP.

This solution objective also contributes to addressing the problem of clients lacking control and not being aware of the status of knowledge transfer (P4). In order for the client to be able to assess the effectiveness of knowledge transfer and make informed management decisions, it follows that the client must be aware of the SP's knowledge needs.

In response to P4 (Clients lack control and are not aware of the status of knowledge transfer) we infer the solution objective:

SO4. Increase client controllability of the knowledge transfer process.

Fulfilling this solution objective would also contribute to addressing the failure of clients to adapt to the context (P1), in the sense that improving clients' ability to monitor and manage knowledge transfer supports a greater capacity to adapt to the project circumstances.

Design requirements

We now propose design requirements (DRs), which derive from the solution objectives and seek to answer the question, *what should the artifact afford to accomplish its objectives?* The DRs are influenced by the guiding principles described earlier and are based on established understanding from the literature.

As we have seen, a major cause of communication problems in OOSD is the implementation of communication tasks, interaction patterns, or modes of interaction that are beyond the communication skills of participants, which may result in information overload or communication breakdown. We propose the first design requirement

DR1. Communication choices that match the communication capabilities of the team. This design requirement responds primarily to SO1 (Increase responsiveness to the communication context and individual capabilities). It also contributes to addressing SO4 (Increase client controllability of the knowledge transfer process) in the sense that it necessitates a greater level of control of the project manager in determining communication choices.

As noted, the success of a software development project is dependent upon knowledge transfer, acquisition, information sharing and integration, and the minimization of communication breakdown (Walz et al. 1993). Significant cultural difference between client and service provider can make this challenging. Differences in communication norms, attitudes, values and working practices are all culturally embedded and can impede the establishment of communication and understanding among team members. Cummings (2003) identifies that a defining aspect of knowledge transfer in distributed work settings is the distance (organizational, physical, knowledge and norm) between knowledge source and recipient. We contend that bridging such differences is of key importance to establishing the communication capability in the team to support the transfer of implicit knowledge particularly. We propose the second design requirement:

DR2. Bridge distance between team members. This design requirement responds primarily to SO2 (Increase participation of SP team and improve team cohesiveness). It also contributes to SO1 (Increase responsiveness to the communication context and individual capabilities) in the sense that seeking to bridge distance requires that individual communication capabilities are taken into account.

Software development has complex knowledge demands, and although implicit knowledge may be as important, or more important than explicit knowledge (Spohrer et al. 2012) (Hsu et al. 2012), clients often fail to adequately attend to implicit knowledge requirements. Furthermore, as noted, in distributed work settings, transferring explicit knowledge is challenging since even explicit knowledge is context specific (Damian and Chisan 2006) and information that has been codified by the knowledge source may be incompatible with the recipient's understanding, leading to misinterpretation. We propose the third design requirement:

DR3. Address implicit knowledge needs and interpretation of messages. This design requirement responds to SO3 (Improve identification of knowledge need and uptake of success critical knowledge by the SP) and is influenced by the first guiding principle (the duality of knowledge). DR3 also contributes to addressing SO2 (Increase participation of SP team and improve team cohesiveness), in the sense that assuring correct interpretation of messages requires ongoing feedback from the SP team.

In response to SO4 (Increase client controllability of the knowledge transfer process) we propose the fourth design principle:

DR4. Effective mechanisms for monitoring communication and knowledge transfer.

Instantiation of method structure

From the four design requirements we now seek to derive an instantiation of a phase structure for a method for knowledge transfer in OOSD. Derivation of the phase structure is influenced by our two design principles. In respect of our first design principle (Design from the client's perspective) we frame the purpose of each phase in terms of what the client should seek to achieve in response to the design requirements. With reference to the second design principle (The method should be easy to adopt and use), we seek to propose distinct method phases, which break down tasks into a logical, sequenced structure.

We derive a prospective five-phase structure, which we term KAIWA, standing for the phases: *Kaleidoscope, Adapt, Initiate, Weave*, and *Analyze*. KAIWA is a Japanese word which means 'to meet and talk', which is intended as a metaphor for the transition phase and seeks to emphasize the importance of successful communication in effective knowledge transfer.

The first two method phases (*Kaleidoscope* and *Adapt)* derive from SO1 (communication choices that match the communication capabilities of the team). Kaleidoscope is an information gathering phase, with the purpose of eliciting information about team members' culture and communication capabilities. In order for communication choices to match the

communication capability of the team (DR1), it follows that the client must be aware of communication capabilities of the team (Watson-Manheim et al. 2002). The client needs to establish an understanding of the level of cultural difference (Shenkar 2001) between onshore and offshore team members and other factors that are likely to affect communication processes, including the communication and collaboration competency of members of the service provider team.

The Adapt phase comprises the client tailoring communication and media to avoid communication breakdown, misunderstanding and information overload. Manipulating media choices and how they are used is an important variable that project managers can influence (Niinimäki et al. 2010; Ramachandran 2005). In order for communication to match the capabilities of the team (DR1) and enable successful communication it is necessary to make communication choices that are tailored to those capabilities.

The Initiate phase reflects the concept that the first involvement of operational team members in a project and the first interaction with remote colleagues can set the tone for relationships (Kirkman et al. 2004). For instance, interaction patterns during the first contact could serve to either reinforce or challenge established hierarchies. The purpose of the Initiate phase is to commence the project and begin knowledge transfer appropriately to bridge distance between team members.

An appropriate communication inception can be used to get team relationships off to a good start, but in order to address implicit knowledge needs and interpretation of messages (DR3), strong communication ties between team members are needed, established through frequent, intense, reciprocal, and personal interactions (Yuan et al. 2010). The purpose of the Weave phase is to establish knowledge discourse for knowledge transfer and relationship development.

The final phase, Analyze, responds to DR4 (Effective mechanisms for monitoring communication and knowledge transfer) and reflects the understanding that monitoring and intervention by a project manager in the communication between operational team members can improve knowledge transfer outcomes. As noted, it is recognized that a project manager can have a positive influence on establishing effective communication through adopting instruments of control and motivation (Foss and Pedersen 2002). The purpose of the Analyze phase is to monitor communication and supervise knowledge discourse.

Figure 3 depicts the goals and the derivation of design requirements and phases.

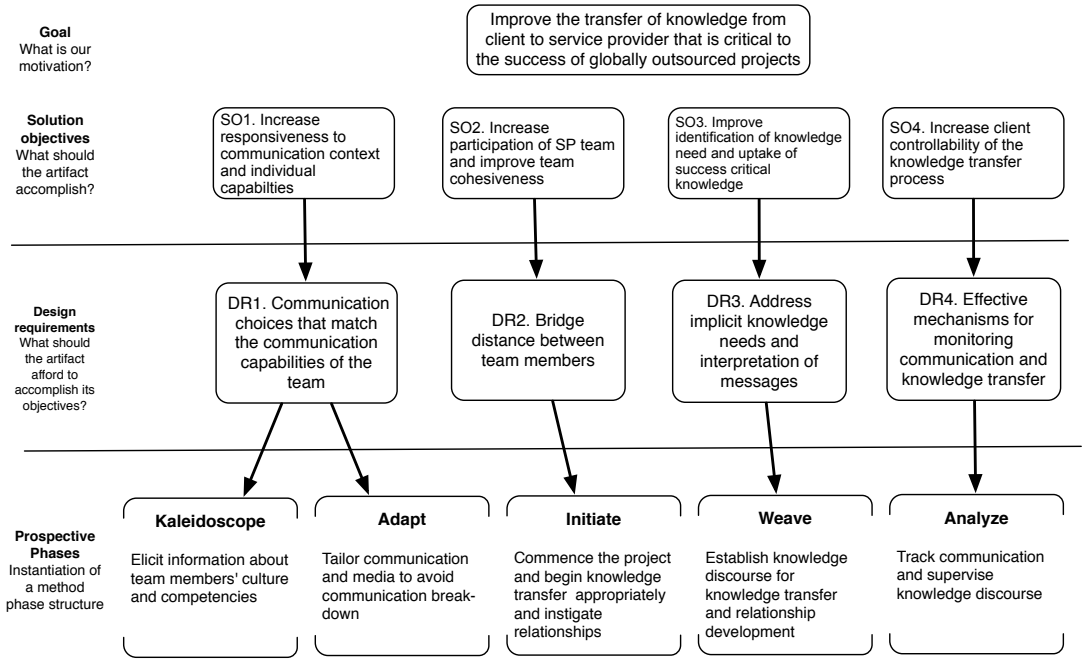

Figure 3 Establishing design elements

The purpose of KAIWA is to provide a logical sequence for knowledge transfer and a structure within which roles and responsibilities can be assigned, outputs can be defined and communication actions can be grouped. Further research is intended to define these elements and develop the KAIWA structure into a method for knowledge transfer in OOSD. To guide this further research, we put forward in the following table parameters and challenges relating to the design of each method phase.

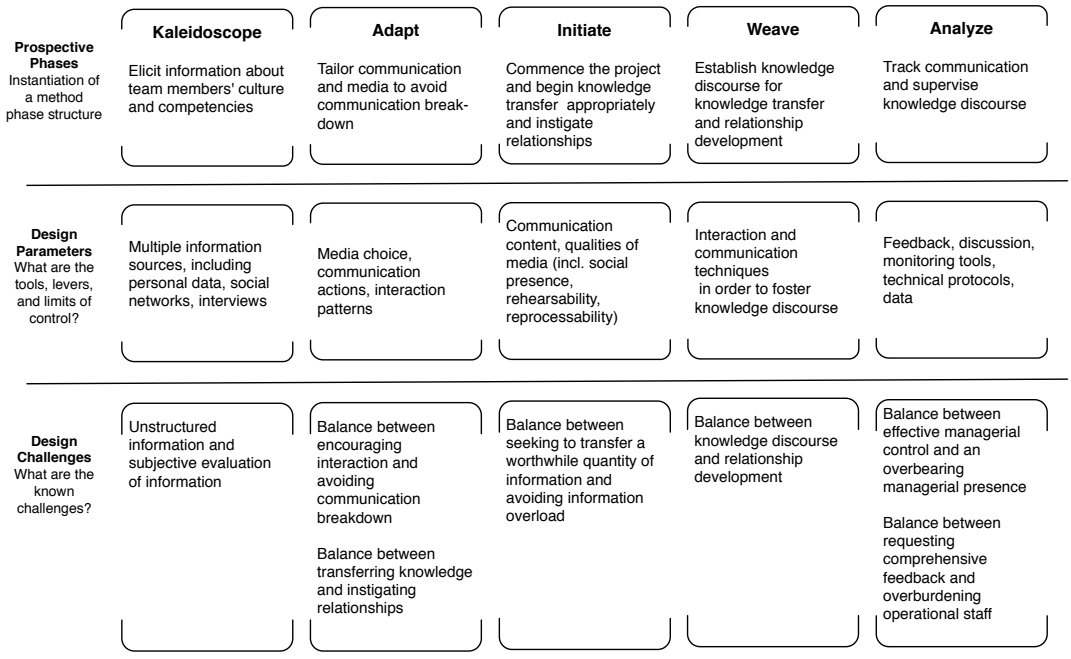

Figure 4 Design parameters and challenges

DISCUSSION AND CONCLUSIONS

This paper seeks to respond to the problem of ineffective or failed knowledge transfer in the transition phase of offshore outsourced projects, through establishing design elements, including an instantiation of a method structure, which are intended to serve as the basis for development of a knowledge transfer method.

We now evaluate the prospective method structure by reflecting on it in relation to the problems of knowledge transfer in OOSD, which formed the entry point of this research.

The problem of clients failing to adapt to the context (P1) is addressed through the Kaleidoscope phase, in which the client conducts background research in order to gain a greater understanding of the communication context in terms of cultural distance and the capabilities of team members. P1 is also addressed through the Adapt phase, in that the client should seek to make communication actions and media selections based on their understanding gained in the Kaleidoscope phase.

Furthermore the Adapt phase contributes to overcoming the problem of poor communication and team cohesiveness (P2) through demanding that the client makes communication choices which limit the possibility of communication break-down or information overload. The Initiate phase contributes to overcoming poor communication and team cohesiveness by requiring the client to plan and manage the instigation of team relationships. Through necessitating regular interaction between offshore and onshore team members, the Weave phase provides the basis for team cohesiveness to develop. Regular interaction between client and SP in the Weave phase is also the basis for addressing the problem of success critical knowledge not being transferred (P3), since it is only through frequent, intense communication that implicit knowledge needs can be uncovered and addressed, and the interpretation of messages can be checked and remedied if necessary.

The Analyze phase addresses both P3 and the problem of clients lacking awareness and control of knowledge transfer (P4), since improving the clients' capacity to monitor the knowledge transfer process improves their awareness of the effectiveness of knowledge transfer measures, thereby informing and directing potential interventions.

The problem of SP developers not meeting client expectations in terms of background and technical knowledge (P5) is not addressed by the KAIWA phase structure as directly as the other problems. Nevertheless, two project phases (Kaleidoscope and Weave) may contribute to improving management of this problem through potentially facilitating earlier client awareness of this problem. Through background research in the Kaleidoscope phase, and a

higher level of interaction between operational team members in the Weave phase, gaps in technical and background knowledge in the SP team may be identified earlier, allowing the client to address the problem more effectively.

This paper represents one of the rare attempts to follow a design process to establish design elements from which to develop a method. Whilst the paper fulfills only part of the design process, the evaluation of the outcomes indicates that the design elements form a sound basis from which to build a method for knowledge transfer in OOSD.

This paper has several limitations. Whilst we endeavored to base our argumentation in? developing the design elements on established concepts from the relevant literature, elements of the framework are based on our own inference. The problems that formed the entry point of our research were based on a combination of our own experience and commonly observed issues from the literature. Nevertheless, it cannot be considered a comprehensive list of knowledge transfer related problems in OOSD. In the absence of an alternative mechanism for assessing the prospective method structure, the evaluation above is based on our own supposition and should therefore be considered tentative. The design elements were considered and devised only with the transition phase of OOSD in mind and it remains to be seen whether the design process and outcomes are potentially relevant in other project phases, other applications or in other industries.

Further research is intended to build on the design elements in this paper through developing an instantiation of a methodology for knowledge transfer in OOSD, based on the five-phase structure presented here. Through subsequent research, we intend to fulfill the remaining DSR stages, including through demonstrating and evaluating the applicability of the method through deploying it in real OOSD projects.

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