DOCTORAL DISSERTATION

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Title:

KNOWLEDGE TRANSFER IN IS OFFSHORING

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PREFACE

The motivation to investigate knowledge transfer in information systems (IS) offshoring originates from previous work on the topic in the context of my master's thesis and within the scope of my consulting activities.

The thesis presents, among other things, motives, experiences, and difficulties of IS offshoring from Germany to India. The results indicate that German companies primarily offshore IS services to reduce costs and to achieve a competitive advantage. In particular, the open communication of problems, and the comprehension in communication cause difficulties for the companies surveyed. I have learned that there is great interest in finding solutions to the difficulties ahead.

This finding was also confirmed in practice. In my role as a consultant supporting software development projects in several companies, I was continuously faced with challenges associated with global cooperation. The transfer of knowledge from client to vendor was closely connected with enormous efforts and significantly influenced the progress of the project.

Hence, this topic appeared relevant to theory and practice and raised my interest in investigating it extensively. In order to contribute to the academic debate, I began with the definition and conceptualization of the IS offshoring research field. These were followed by several theoretical and methodological contributions, including the investigation of roles and determinants that influence the knowledge transfer in IS offshoring.

Overall, the dissertation consists of seven consecutive research articles. The results contribute to the understanding of IS offshoring in general and knowledge transfer in IS offshoring projects in detail. Furthermore, the results can facilitate organizations in ensuring their IS offshoring projects succeed.

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LIST OF ABBREVIATIONS

ABDC   Australian Business Deans Council

BIBD   Balanced Incomplete Block Design

BPO   Business Process Offshoring

BWS   Best-Worst-Scaling

CV   Coefficient of Variation

ERA   Excellence in Research for Australia

IS   Information Systems

UCF   Universal Competency Framework

VHB   Verband der Hochschullehrer für Betriebswirtschaft

WKWI   Wissenschaftliche Kommission Wirtschaftsinformatik

1. MOTIVATION

This dissertation views information systems (IS) offshoring as the partial or total transfer of information systems services (application development, business processes, or infrastructure) to an internal, partially-owned, or external offshoring service provider organization in a near or far away country different to that of the client organization. According to Willcocks, Lacity, and Sauer (2017), Kodak was the first fortune 500 company to outsource its IS services to another organization in 1989. Almost 30 years later, the transfer of IS services outside a service consumer's home country has evolved to an important component for organizations to remain competitive and strengthen their position in the market (Creon, Grover, & Teng, 2017; Oshri, Kotlarsky, & Willcocks, 2011). The major reasons for engaging in offshoring are to benefit from lower labor costs and to get access to talent and markets (Dedrick, Carmel, & Kraemer, 2011). However, IS offshoring is also associated with various detrimental effects; e.g., cultural differences and language problems (Gonzalez, Gasco, & Llopis, 2010; Klimpke, Kramer, Betz, & Nordheimer, 2011).

Academic research shows considerable interest in this subject, especially over the last 15 years (Willcocks et al., 2017). During this period, the number of IS offshoring publications per year has increased (Strasser & Westner, 2015; Westner & Strahringer, 2007; Wiener, Vogel, & Amberg, 2010). We identified three major shortcomings within this academic debate. First, a consolidated view of the IS offshoring research field including a broader consideration of leading IS journals and conferences is missing. Second, previous literature underlines the importance of empowering individuals who conduct the transfer of knowledge between organizations (Nguyen et al., 2014; Betz et al., 2014), whereby research of the characteristics of these individuals in an IS offshoring context is lacking. Third, there is only limited research available regarding the critical factors of knowledge transfer in IS offshoring. The dissertation aims to fill these gaps by investigating the following research questions:

RQ1: What is the state of research in IS offshoring?

RQ2: What are the characteristics of individuals conducting the knowledge transfer in an IS offshoring context?

RQ3: Which determinants influence the knowledge transfer in IS offshoring?

The answer to RQ1 aims to provide a conceptualization and the theoretical underpinning of the research field including a consolidated state of IS offshoring research. RQ2 aims to understand the crucial role individuals must fulfill within the knowledge transfer process. RQ3 aims to answer which determinants influence knowledge transfer in positive and negative ways.

The remainder of the first part (synopsis) is as follows: in Section 2, the research design of the dissertation is described by explicating its epistemological position, its research objectives, and the research methods used. Section 3 gives an overview of the academic publications and summarizes the key results of each paper. The synopsis ends with Section 4 by summarizing the main contributions for research and practice, the limitations, and the research perspectives.

The remainder of the second part (publications) includes an overview page, the content page, and unpublished appendices for individual publications.

2. RESEARCH DESIGN

This dissertation's research design is based on the framework of Becker, Holten, Knackstedt, and Niehaves (2003), cf. Figure 1. The research design's focus is the selection of a research method, which is influenced by the epistemological position containing basic epistemological, ontological, and linguistic questions (Becker et al., 2003). In addition, the definition of research objects, separated into cognition and design objectives, shapes the selection of a research method. The epistemological position and the research objectives are dependent; i.e., according to the procedure either the epistemological position influences the research objectives or vice versa. Sections 2.1 to 2.3 describe the selected epistemological positions, research objectives, and research methods in detail.
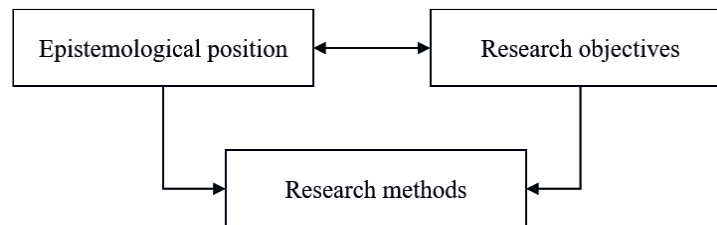

Figure 1: Framework to the definition of the research design (Becker et al., 2003)

2.1 Epistemological position

In order to define the epistemological position, Becker and Niehaves (2007) suggest answering five questions, cf. Table 1. The grey marked squares in Table 1 illustrate the selected epistemological positions for this dissertation.

Epistemological questions	Positions		
What is the object of cognition?	Kantianism	Ontological idealism	Ontological realism
What is the relationship between cognition and the object of cognition?	Constructivism		Epistemological realism
What is true cognition?	Consensus theory of truth	Correspondence theory of truth	Semantic theory of truth
Where does cognition originate from?	Empiricism	Kantianism	Rationalism
By what means can cognition be achieved?	Deductivism	Hermeneutic	Inductivism

Table 1: Epistemological position of this dissertation (Becker & Niehaves, 2007).

Regarding the object of cognition, we take the position of ontological realism. This position assumes "a real world, one that exists independently of cognition, for instance, independent of thought and speech processes" (Becker & Niehaves, 2007, p. 202).

The second question focuses on the relationship between cognition and the object of cognition. This relationship is determined by the subject assuming the cognition of an objective reality is interpreted by the subject, and thus constructivism.

This dissertation follows the consensus theory of truth. According to this theory, statements are true if they are acceptable to the group.

Regarding the origin of cognition, we adopt the Kantianism position. Kantianism is regarded as a conciliating position that recognizes both experience and intellect as sources of origin.

Finally, cognition is obtained inductively. We draw an inductive conclusion from individual expert opinions to universal phrases (Becker & Niehaves, 2007).

2.2 Research objectives

Research objectives in the IS field can be categorized into aiming at cognition or at design (Becker et al., 2003). Cognitive objectives try to understand given facts to make predictions about their changes, whereas design objectives concern the design or modification of existing facts to create new ones (Heinrich, 1999). The research objectives of this dissertation are summarized in Table 2.

Objective aim	Overall objective	Steps	Data source	Paper titles
Cognition	Presentation of the state of IS offshoring research from a managerial point of view	• Conceptualization of the overall research topic • Consolidation of the field of study between 2010 and 2013 • Consolidation of the state of the research between 2000 and 2013 • Presentation of research gaps	Literature	Information Systems Offshoring: Results of a Systematic Literature Review
Cognition	Theory-based conceptualization related to the topic of research	• Design of a theoretical model • Collection and definition of key constructs • Presentation of specific research gaps	Literature	Knowledge Transfer in IS Offshoring: Processes, Roles, and Success Factors
				IT-Offshoring
Cognition	Generating knowledge on the offshore coordinator role	• Identification of the main tasks and skills of the offshore coordinator	Empirical	Knowledge Transfer in IS Offshoring: A Delphi Study of the Offshore Coordinator Role

Objective aim	Overall objective	Steps	Data source	Paper titles
		• Development of a competency model • Identification and definition of implementation aspects		
Cognition	Generating knowledge on the critical factors influencing knowledge transfer	• Ranking of critical success factors by importance • Ranking of critical failure factors by importance	Empirical	Determinants of Success and Failure of Knowledge Transfer in IS Offshoring: A Ranking-Type Delphi Study
Cognition	Conceptualizing the research methodology	• Consolidation of key Delphi method variants and their characteristics • Development of a taxonomy of Delphi method variants	Literature	Delphi Method Variants in IS Research: A Taxonomy Proposal
				Delphi Method Variants in Information Systems Research: Taxonomy Development and Application
Design	Extending the research methodology	• Development of an approach for the design and evaluation of ranking-type Delphi studies	Literature	Design and Evaluation of ranking-type Delphi studies using best-worst-scaling

Table 2: Overview of research objectives

We identified five objectives aiming at cognition and one at design and broke them down into steps. The first two objectives build on secondary data from scholarly literature focusing on the theoretical conceptualization of the selected field of research. The third and fourth objectives build mainly on empirical data to create new knowledge. The last two objectives focus on conceptualizing and extending the research methodology.

2.3 Research methods

A *systematic literature review* was conducted to illustrate the state of IS offshoring research (Cooper & Hedges, 2009; vom Brocke et al., 2009). For analysis and synthesis purposes, we applied a systematic research framework drawing on Dibbern, Goles, Hirschheim, and Jayatilaka (2004), as well as Wiener et al. (2010), and described the findings alongside the IS offshoring stages.

We developed a taxonomy for differentiating characteristics of Delphi Method variants. The *taxonomy development process* was based on Nickerson, Varshney, and Muntermann (2013) and comprises four process steps: (1) choose a meta-characteristic of the object of interest, (2) specify dimensions, (3) define necessary conditions for the taxonomy, and (4) conceptualize characteristics.

In order to investigate individuals who conduct the transfer of knowledge in IS offshoring initiatives, we used a *classical Delphi method* variant (Dalkey & Helmer, 1963) to elicit opinions and to seek consensus. *Content analysis* (Collis & Hussey, 2014) was used to group the ideas and issues suggested by participants in the first iteration. The intention of the second and third round was to gain stability and consensus (Dajani, Sincoff, & Talley, 1979; von der Gracht, 2012). The coefficient of variation (CV) was used to measure stability and consensus (English & Kernan, 1976).

The *ranking-type Delphi method* variant (Delbecq, van de Ven, & Gustafson, 1975; Schmidt, 1997) was conducted to investigate the critical determinants influencing knowledge transfer. The first round was qualitative, using *content analysis* (Collis & Hussey, 2014) to group the determinants and judgements suggested by the participants into common themes. The second and third round pursued the objective to gain stability and consensus (Dajani et al., 1979; von der Gracht, 2012) and to rank all determinants. As an innovative ranking approach, we used *best worst scaling* (Finn & Louviere, 1992; Kobus & Westner, 2016; Strasser, 2018).

3. STRUCTURE OF DOCTORAL DISSERTATION

This dissertation consists of seven consecutive research papers, which were published or are accepted to be published in journals and conferences between 2014 and 2018, cf. Table 3. In Sections 3.1 to 3.7 these research papers will be briefly summarized alongside the category's research focus, role within the overall dissertation, methodology, and research findings. The descriptions are partially extracted from their respective publications.

ID	Section in synopsis	Authors	Year of publication	Paper title	Journal / Conference name
1	3.1	M. Westner A. Strasser	2014	IT-Offshoring	WISU - Das Wirtschafts-studium
2	3.2	A. Strasser M. Westner	2015	Information Systems Offshoring: Results of a systematic Literature Review	Journal of Information Technology Management
3	3.3	A. Strasser M. Westner	2015	Knowledge Transfer in IS Off-shoring: Processes, Roles, and Success Factors	Pacific Asian Conference for Information Systems, Singapore
4	3.4	A. Strasser	2017	Delphi Method Variants in Information Systems Research: Taxonomy Development and Application	The Electronic Journal of Business Research Methods
			Earlier version: 2016	Delphi Method Variants in IS Research: A Taxonomy Proposal	Pacific Asian Conference for Information Systems, Taiwan
5	3.5	A. Strasser	2019	Design and Evaluation of ranking-type Delphi studies using best-worst-scaling	Technology Analysis & Strategic Management
6	3.6	A. Strasser M. Westner S. Strahringer	2019	Knowledge Transfer in IS Off-shoring: A Delphi Study of the Offshore Coordinator Role	Journal of Systems and Information Technology
7	3.7	A. Strasser S. Strahringer M. Westner	in press	Determinants of Success and Failure of Knowledge Transfer in IS Offshoring: A Ranking-Type Delphi Study[1]	International Journal of Information Technology and Management

Table 3: Overview of the consecutive research papers

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[1] This article is accepted for publication (in press)

3.1 IT-Offshoring

Research focus: The initial paper serves as an overview of IS offshoring, describing the term, dimensions, concepts, and key advantages and disadvantages.

Role within overall dissertation: The paper intends to give a brief overview of theoretical basics regarding the chosen dissertation topic of IS offshoring.

Methodology: A literature search was conducted to identify relevant literature.

Research findings: A clear definition of the term IS offshoring, including a description of the four dimensions (degree, distance, function, and ownership), as well as their associated concepts, was introduced. We present five advantages that are associated with IS offshoring: access to resources, competitive advantages, cost savings, efficiency gains, and quality improvements. In contrast, there are five disadvantages related to IS offshoring: competitive detriments, data protection, extra costs, false procurement, and geopolitical conditions and their development.

3.2 Information Systems Offshoring: Results of a Systematic Literature Review

Research focus: The literature review presents a comprehensive view of the field of study between 2010 and 2013 from a managerial point of view. It ensures continuity of research by building upon a previous literature analysis (Wiener et al., 2010) covering the years 1999 to 2009. Hence, the literature findings are compared with Wiener et al.'s (2010) findings. The literature review consolidates and critically reflects the state of the research of the last 15 years and identifies future research directions.

Role within overall dissertation: The paper intends to answer RQ1 by providing a clear theoretical foundation of the research field and indicating research gaps.

Methodology: The literature review was conducted following the five-step framework of vom Brocke et al. (2009): review scope, topic conceptualization, literature search process, literature analysis and synthesis, and summary of findings and agenda for research. For the definition of the review scope in the first step, we endorsed the proposal of vom Brocke et al. (2009) to draw on a taxonomy of literature reviews developed by Cooper and Hedges (2009). For analysis and synthesis purposes in step four we applied a systematic research framework drawing on Dibbern et al. (2004) and Wiener et al. (2010), which is composed of three perspectives: reference theory, research approach, and research focus. Finally, we describe the findings along the IS offshoring stages of what, why, which, how, and outcome (Dibbern et al., 2004).

Research findings: From 2010 to 2013 there are a total of 95 articles; 64 were published in 41 journals and 31 in eight conferences. The amount of publications over the four-year time-period confirms the continuously increased attention to IS offshoring as a research area and indicates that IS offshoring is a well-established and distinct research field by now.

Regarding reference theories used, it is clear that most papers (71 items) lack a clear theoretical foundation (cf. Table 4). If they have a theoretical foundation, social and organizational theories dominate. The most commonly used theory in this category is the social exchange theory (15 items). Further important theories include agency theory and transaction cost theory (economic, four and eight items), as well as resource and knowledge-based theories (strategic, six and four items). Our results are similar to Wiener et al. (2010) and confirm that IS offshoring publications of the last four years still lack a clear theoretical foundation.

Stage	Σ	Resource theories	Strategic management theories	Knowledge-based theories	Agency theory	Transaction cost theory	Social exchange theory	Power and politics theory	Relationship theory	Other	Other theories	N/a
		Strategic theories			Economic theories		Social / organizational theories				Other	N/a
Why	8	1		1	1	1	1					6
What	3					1	1					2
Which	6									1	1	5
How	50			3	1	1	7			3	1	37
Outcome	34	5			2	5	6			1		21
Σ	**101**	**6**	**0**	**4**	**4**	**8**	**15**	**0**	**0**	**5**	**2**	**71**

Table 4: Reference theories of relevant IS offshoring publications

Almost all reviewed IS offshoring publications (96 of 101 items[2]) make use of empirical research methods (cf. Table 5). Consistent with Wiener et al.'s (2010) literature review, our results confirm that interpretive research (58 items) still dominates the IS offshoring research field, followed by positivist research (34 items). Interpretive research is used more often (compared to positivist research) across the stages of why, which, and how. Only papers in the outcome stage

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[2] We described the findings alongside the IS offshoring stages. We identified six articles that belonged to two stages. Hence, 95 articles assigned to 101 stages. Subsequently, these six items are separated by stages.

employ positivist methods more frequently than interpretive ones. Wiener et al. (2010) and our findings thus contradict the general dominance of positivist research in the IS domain (Chen & Hirschheim, 2004; Orlikowski & Baroudi, 1991) and suggest an increasing acceptance of interpretive research in the IS research field. Descriptive and conceptual research is rarely used and none of our findings employ a mathematical epistemology type.

Stage	Σ	Approach		Epistemology				
		Empirical	Non empirical	Interpretivism	Positivism	Descriptivism	Conceptual	Mathematical
Why	8	7	1	4	2	1	1	
What	3	3		1	1	1		
Which	6	6		3	1	2		
How	50	48	2	39	10	2	2	
Outcome	34	32	2	11	20	1	2	
Σ	**101**	**96**	**5**	**58**	**34**	**7**	**5**	**0**

Table 5: Research approaches of relevant IS offshoring publications

The research foci comprise aspects regarding stage, function, degree, ownership, distance, and point of view (cf. Table 6).

Stage	Σ	Function				Degree			Ownership				Distance				Point of view		
		Infrastructure	Application	Business process	N/a	Total	Selective	N/a	Internal	Partial	External	N/a	Offshore	Nearshore	Onshore	N/a	Client	Supplier	Consultant
Why	8	1	2	3	2		8		1	1	5	3	8	2	2		6	2	
What	3		2	1			2	1	3	2	3		3	1			2	1	
Which	6	2	5				6		3		1	2	6	2	1		6		
How	50	3	43	9	4	2	44	6	15	5	39	4	47	13	3		30	34	1
Outcome	34	4	25	8	4		28	6	5	3	26	8	31	2	4	3	20	23	
Σ	**101**	**10**	**77**	**21**	**10**	**2**	**88**	**13**	**27**	**11**	**74**	**17**	**95**	**20**	**10**	**3**	**64**	**60**	**1**

Table 6: Research foci of relevant IS offshoring publications

Our findings indicate that the focus of research is on the implementation phase of IS offshoring, composed of the how (50 items) and the outcome stage (34 items). The remaining 17 items refer to the pre-implementation stages of IS offshoring concerning researching why to consider offshoring (eight items), what to offshore (three items), and which decision to make (six items). Hence, according to Wiener et al.'s (2010) results and our findings, the IS offshoring research of the last 15 years primarily focuses on implementation aspects while the pre-implementation stages of IS offshoring (what, why, and which) are sparsely researched.

Approximately three quarters of the studies (77 of 101) concentrate on software application offshoring. Over all of the stages (except for why) the scope of research is on application development services over infrastructure or process services. This observation confirms that the previous (Wiener et al., 2010) and recent (our literature review) IS offshoring research primarily consider application development services. This is presumably because this IS offshoring function comes with the highest potential for savings due to its labor intensity. Similarly, business process offshoring (BPO) is increasingly being researched: while Wiener et al. (2010) find only four BPO-publications (two in the why-stage, one each concerning what and outcome, and none in the how-stage), we identify 21 papers, of which the most belong to the how (nine articles) and outcome stages (eight articles).

Our analysis shows that IS offshoring research concentrates on selective offshoring (88 publications). Only two papers include total offshoring aspects. This finding leads to the conclusion that only a small number of firms relocate their entire IS functions and most opt for offshoring particular IS functions or parts of these functions. These results confirm that a differentiation between partial and total offshoring appears less relevant (Strasser & Westner, 2015, p. 76).

The vast majority of IS offshoring publications focus on external arrangements with a third-party provider (74 items). However, research regarding internal or partial ownership increases: while Wiener et al. (2010) identified 19 articles (from 96) dealing with internal and partial ownership over a ten year period, we found 38 articles in the last four years. This result suggests that these sourcing modes have been increasingly explored over the last few years.

Regarding the distance of transferred IS services, the focus is unambiguously on offshoring (95 items). Although we find 20 articles regarding nearshoring and ten regarding onshoring, only three of them solely concentrate on nearshoring and none of them exclusively on onshoring. These results illustrate that the specific nature of nearshoring and onshoring is sparsely researched, despite the fact that several studies indicate that nearshoring has substantially different characteristics compared to offshoring (Abbott & Jones, 2012; Carmel & Abbott, 2007).

IS offshoring research is rather balanced regarding the applied point of view. Thirty-five articles deal solely with the client side, while 37 exclusively take the view of the supplier. The majority of research from the client's side takes the view from the European perspective (21 articles), especially from Germany (nine articles), relocating IS services primarily to Indian (14 articles) or European (six articles) vendors (multiple response allowed). Furthermore, twelve articles focus on a U.S. viewpoint, mainly offshoring to India (eight articles). These findings indicate an increasing amount of research from the European perspective, in particular from Germany. We agree with Wiener et al. (2010) and still see a need for IS offshoring research from a European perspective. While Wiener et al. (2010) realizes that IS offshoring research across all stages primarily concentrates on client perspectives, our findings show that the IS offshoring research of the last four years incorporates multiple points of view.

3.3 Knowledge Transfer in IS Offshoring: Processes, Roles, and Success Factors

Research focus: The third paper is conceptual in nature. It conceptualizes the IS offshoring research field with respect to knowledge transfer processes, roles, and their influence on success and failure factors. These results build the foundation for investigating this research topic in detail.

Role within overall dissertation: The paper intends to conceptualize the selected research field as a groundwork for the subsequent research study.

Methodology: The methodology applied was similar to the initial literature review, cf. Section 3.2, including five steps: review scope, topic conceptualization, literature search process, literature analysis and synthesis, and summary of findings and agenda for research.

Research findings: A consolidated view of the field of study covering the last 15 years of IS offshoring research is presented. This includes a generic knowledge transfer process consisting of four stages and five milestones. The initiation stage starts with the decision to offshore IS functions for an organization. In this stage the onshore organization searches for a suitable offshore service provider. 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. The main activities of the implementation stage address the codification, storage, and centralization of knowledge. If basic knowledge is transferred, the ramp-up stage starts. This stage is characterized by the application of the acquired knowledge to operational work and learning from experiences. Once the offshore team members are ready to take over full operational responsibility, the last integration stage begins. The offshore team works independently

within their scope and apply what they learn to their daily jobs. These five 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 objectives 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. Thus, the offshore coordinator has to coordinate both teams, cultivate and intensify the relationship, eliminate the lack of equivalence, fill cultural gaps, and overcome communication barriers. In order to succeed in these tasks, the offshore coordinator needs communication skills, distinctive skills and attributes, higher education, IT skills, and work experience.

Finally, we identify and cluster core factors that influence success or failure of knowledge transfer. The factors that positively influence knowledge transfer between client and vendor can be divided into key conditions for sharing knowledge and utilizing techniques used to facilitate a positive knowledge transfer process. In contrast, there are factors that negatively influence knowledge transfer. These are factors related to capabilities, cooperation and strategy, culture and mentality, external influences, and management.

3.4 Delphi Method Variants in Information Systems Research: Taxonomy Development and Application

Research focus: The fourth paper (1) identifies different variants of Delphi and determines their characteristics, (2) critically reflects to what extent a clear distinction between these variants exists, (3) shows the clearly distinguishable Delphi Method variants and their characteristics, (4) develops a taxonomy of Delphi Method variants, and (5) evaluates and applies this taxonomy.

Role within overall dissertation: The paper intends to prepare research method selection and justification of research method appropriateness in later research steps.

Methodology: A literature retrieval was conducted to identify Delphi Method variants and their characteristics in IS research. The search process was comprised of five leading databases. We used a forward and backward search approach according to Webster and Watson (2002) to determine prior articles and to identify further articles. An evaluation of sources ensured that only relevant research articles were included (vom Brocke et al., 2009). The taxonomy development process, based on Nickerson et al. (2013), consisted of four process steps: (1) choose a meta-

characteristic of the object of interest, (2) specify dimensions, (3) define necessary conditions for the taxonomy, and (4) conceptualize characteristics.

Research findings: We found 13 Delphi Method variants in IS research and analyzed them critically. The results indicate that all variants show the four generic characteristics of the Delphi Method (anonymity of participants, controlled feedback, iterative process, and statistical aggregation of group response), but differ regarding how they determine expertise, their focus and objective, as well as their level of anonymity. While the definition of the respective Delphi Method variants is inconsistent and six of these variants lack a clear objective and focus, we suggest three conditions that must be met to accept a Delphi method modification as a Delphi Method variant: (1) generic characteristics of Delphi are fulfilled, (2) a differentiating focus and objective exists, and (3) a sufficiently robust description of the Delphi Method variant is provided. By applying these conditions to the identified 13 Delphi Method variants, seven variants with different focus and objectives remain. We described the characteristics of these Delphi Method variants in detail and generalize these findings to develop a taxonomy. This taxonomy includes seven dimensions and 23 characteristics to clearly differentiate and characterize Delphi Method variants (cf. Table 7).

Dimensions	Characteristics						
Focus and objective	Arguments: Develop relevant arguments and expose reasons	Decisions: Prepare and support decisions	Facts: Elicit opinion and gain consensus	Ideas: Define and differentiate views	Opinions: Opinion capture in multi-disciplinary tasks	Rankings: Consensus about the relative importance of a set of issues	Scenarios: Construct holistic scenarios
Panel participant	Expert in narrow sense			Expert in broad sense			
Participating group	Restricted anonymity			Total anonymity			
Round 1 design	Qualitative			Quantitative			
Specific characteristics of the panel	Size of panel should be high in absolute terms	Consider different groups of experts	Cover a high percentage of a specific group of experts	Should include a group of experts with no strong personality conflicts	Size of panel should not be too large		
Issues developed from	Experience of participants		Literature review		Pilot study		
Processing of the results	IT-supported			IT-supported in real-time			

Table 7: Dimensions and characteristics of Delphi Method variants

Finally, we evaluate this taxonomy. First, we apply it to selected IS research published in highly-ranked IS journals. This evaluation reveals that a purposeful and unambiguous determination of the chosen method variant using the taxonomy is possible. Thus, we tentatively claim that the taxonomy is comprehensive and helps clearly distinguish differentiating features of the Delphi method. Second, we evaluate the practical applicability of the taxonomy by using it to define the specific Delphi design for one of our research projects. We demonstrate that a clear definition of the selected Delphi Method variant and its characteristics can be easily, yet precisely, documented. Overall, this will help researchers in specifying their research method concisely and unambiguously, without burdening readers of research papers with verbose sections on methodology.

3.5 Design and Evaluation of Ranking-type Delphi Studies using Best-worst-scaling

Research focus: This paper describes an approach for the design and evaluation of ranking-type Delphi studies using best-worst-scaling (BWS). An example guide is used to illustrate the usage of BWS to obtain a full ranking of items. The statistical BWS design is based on a balanced incomplete block design (BIBD) to construct the comparison sets. The statistical evaluation encompasses the measurement of stability and consensus with the use of the CV.

Role within overall dissertation: This paper intends to illustrate the advanced research method used to investigate determinants of success and failure of knowledge transfer in IS offshoring (cf. Section 3.7).

Methodology: We conduct a literature search on BWS and methods to measure stability and consensus. These results are used to develop an approach for the design and evaluation of ranking-type Delphi studies. This approach is applied to investigate the determinants of success and failure of knowledge transfer in IS offshoring, cf. Section 3.7. Extracts thereof are used to practically illustrate the design and evaluation of ranking-type Delphi studies using BWS.

Research findings: The resulting step-by-step guide illustrates the design and evaluation of ranking-type Delphi studies using BWS. The statistical BWS design is based on a BIBD to construct the comparison sets. We list all practicable BIBD settings and show that a BIBD based questionnaire can hold six to 22 items. For our guiding example we choose a BIBD with 11 items illustrating the design of the questionnaire and the question blocks. For the evaluation, we show that the linear transformed mean ($\bar{X}$) differences of best minus worst scores of each item are suitable to obtain a ranking. In addition, the CV is a sufficient and easily applicable measurement method for consensus, whereas the difference of CVs in two consecutive rounds can be used the same way to measure stability. The sequence of the final ranking list is determined by the $\bar{X}$ value,

ranked from high to low. Overall, our research contributes suggestions on how to successfully combine BWS with Delphi by maintaining each of the methods' particular and valuable specificities.

3.6 Knowledge Transfer in IS Offshoring: A Delphi Study of the Offshore Coordinator Role

Research focus: The main tasks, necessary skills, and implementing the offshore coordinator's role to facilitate knowledge transfer in IS offshoring are investigated.

Role within overall dissertation: This paper answers RQ2 by presenting the research results in relation to the characteristics of the offshore coordinator role.

Methodology: The empirical exploratory study uses the classical Delphi method that includes one qualitative and two quantitative rounds to collect data on IS experts' perceptions to seek a consensus among them. We focus on 32 highly experienced experts with more than ten years of IS offshoring experience. Content analysis (Collis & Hussey, 2014) is used to group the ideas and issues suggested by participants in the first round into common themes. In the quantitative rounds, the participants express their agreement with the ideas and issues suggested in the previous round using a five-point Likert scale. To focus on the critical determinants, we decided to take tasks and skills with a mean value of ≥ 4 into consideration. We employed statistical treatment of data with the CV procedure to measure the degree of stability and consensus.

Research findings: Overall, our research identified 15 skills and 16 tasks assigned to nine of the 20 competency dimensions and six of the eight high-level competency domains of the Universal Competency Framework (UCF). The tasks focused primarily on relationship management and facilitating knowledge transfer on different levels. The set of skills consists of approximately 25% "hard" skills (e.g., professional language skills and project management skills), and approximately 75% "soft" skills (e.g., interpersonal and communication skills and the ability to deal with conflict). Hence, the offshore coordinator needs to have a variety of skills to fulfill tasks in the context of knowledge transfer. Due to the variety of skills and the fact that work experience is critical, the offshore coordinator role, from our perspective, should be filled by an experienced individual.

Regarding the implementation of the offshore coordinator role in practice, our findings indicate that the offshore coordinator role was mainly taken on by a person as the main responsibility in a full-time position. Practical implementation of the offshore coordinator role is mainly influenced by two factors: project size and number of projects to be supported simultaneously. Further, the

participants agreed that if the tasks of an offshore coordinator are assigned to a person in a full-time position as his/her main responsibility, the success of the knowledge transfer will improve significantly. Finally, the designation for the offshore coordinator role is inconsistent in practice as a unified terminology does not yet exist.

3.7 Determinants of Success and Failure of Knowledge Transfer in IS Offshoring: A Ranking-type Delphi Study

Research focus: The seventh paper examines the determinants of success and failure of knowledge transfer in IS offshoring projects.

Role within overall dissertation: This paper answers RQ3 by presenting the research results in relation to the determinants that influence the success and failure of knowledge transfer in IS offshoring.

Methodology: We used a ranking-type Delphi method for our study design. The focus and objective of the ranking-type Delphi is to seek a consensus of the relative importance of a set of issues. We questioned 32 experts from Germany, each with more than ten years of experience in near- or offshore initiatives. The ranking-type Delphi study included one qualitative and two quantitative rounds. Content analysis (Collis & Hussey, 2014) was used to group the determinants and judgements suggested by participants in the first iteration into common themes. The second and third round pursued the objective to rank all determinants. We used BWS as a ranking approach, and we used a BIBD for the statistical design. An individual rating of the items was done by calculating the item-wise difference between best and worst scores. To obtain positive-only ratings that are more familiar for rating scales, a linear transformation on the means (X) was conducted. Hence, the ranking results from the achieved $\overline{X}$ value. We employed statistical treatment of data with the CV procedure to measure the degree of stability and consensus.

Research findings: We found a consensus among the group of experts according to 19 determinants of success and 20 determinants of failure. The three most important determinants of success focus on aspects of closer cooperation. This includes (1) collaborating regularly to clarify questions, solving problems together, and exchanging information on current topics; (2) a willingness to help and support the offshore team and share personal knowledge and experiences; and (3) mutual trust. We further found that working together on problems from daily operations is critical but needs to be supplemented by carrying out training or workshops. The last three determinants of success focus on aspects related to project control, responsibility, and used methods. This includes (1) establishing a detailed project control to progress the knowledge

transfer process and report to the next higher management level; (2) receiving a site's readiness to take over the responsibility; and (3) the usage of an accepted and understood development methodology.

The three most important determinants of failure concern fears and fluctuation. This includes (1) the fact that the offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because this would unveil a lack of technical knowledge; (2) the unwillingness and inability of the onsite team to share knowledge due to, e.g., anxiousness over losing work or fear of change; and (3) high fluctuation of team members at an offshore site. Another finding was that the knowledge transfer is negatively influenced by a lack of different skills and competencies, primarily at the offshore site. This includes insufficient language skills, limited background knowledge relevant to the project, lack of soft skill competencies, and low technical capabilities. In addition, the transfer of explicit knowledge is impeded while adequate documentation with consistent terminology and a common knowledge base is lacking. The last three determinants of failure focus on IT (equipment) and contractual limitations, encompassing (1) missing technical equipment or lack of tools for knowledge transfer, (2) contractual limitations on time, and (3) latency time using IT and media (for example, in video conferences).

4. SUMMARY OF RESULTS

This section reflects the results of the aforementioned seven consecutive research papers in an overarching level by summarizing the dissertation's contribution to research (cf. Section 4.1) and practice (cf. Section 4.2). In Section 4.3 the limitations and research perspectives to this dissertation are discussed.

4.1 Research contribution

The dissertation contributes to the IS body of knowledge in four ways: (1) consolidating and critically reflecting the state of the IS offshoring research; (2) conceptualizing the IS offshoring research field with respect to knowledge transfer processes, roles, and their influence on success and failure factors; (3) proposing a taxonomy that helps to clearly differentiate Delphi Method variants; and (4) introducing an approach for the design and evaluation of ranking-type Delphi studies in IS research.

(1) An extensive literature review provides a consolidated view of the current IS offshoring field of study (2010-2013) and ensures continuity of research in connection to a literature review covering the years 1999-2009. This way it consolidates and critically reflects the state of research over the last 15 years. The results indicate that while the amount of IS offshoring research is increasing, there are still gaps. The different usage of the term 'IS offshoring' and the evolution of terms based on variations or specific characteristics leads to a variety of different terminologies that impede a clear understanding of IS offshoring and its different characteristics. Hence, we propose an initial definition and conceptualization of IS offshoring. This includes a clear definition of the term IS offshoring and a proposal to use a template, based on the essential categories of IS offshoring, to create a common terminology and a common understanding. Future research can build on this foundation to further investigate the field of IS offshoring research.

(2) The dissertation contributes to conceptualizing knowledge transfer in an IS offshoring context that was characterized by diverse and heterogeneous research findings. The dissertation provides a consolidated view of the field of study by integrating IS offshoring research findings on knowledge transfer processes, roles, and success and failure factors within a conceptual framework. The conceptual contribution is threefold: firstly, we conceptualize a generic knowledge transfer process that consists of four phases and includes five milestones. In addition, the main characteristics of each stage are summarized. Secondly, research has found differently named

roles involved in knowledge transfer. We aggregate these findings and develop a general role we label 'offshore coordinator'. Moreover, the core tasks of an offshore coordinator and main skills necessary to perform this role are presented. Thirdly, we identify and characterize core factors that influence success or failure of the knowledge transfer process between client and vendor. In summary, these results offer a contribution to conceptualizing knowledge transfer in the IS offshoring research field and forms the foundation for more detailed research in the future.

(3) The dissertation contributes to clearing the ambiguity regarding the differentiation and definition of Delphi Method variants in IS research. We confirmed that a multitude of Delphi Method variants have been defined and are used in IS research, while a clear distinction between these variants is missing. The dissertation proposes three conditions that must be met to accept a Delphi method modification as a fully defined Delphi Method variant. Further, it presents a taxonomy of Delphi Method variants. This taxonomy includes seven dimensions and 23 characteristics to clearly differentiate and characterize Delphi Method variants. Thus, it contributes to enhancing rigor while applying the Delphi method in IS research.

(4) Finally, the dissertation introduces an approach for the design and evaluation of the most frequently used Delphi Method variant in IS research, the ranking-type Delphi. In order to rank a set of items, ranking-type Delphi studies use different ranking approaches that may be biased. This is intensified by the fact that the number of issues a participant can reasonably rank is limited. We confirmed that BWS is one way to avoid and overcome shortcomings of common ranking approaches. Further, this dissertation provides a step-by-step guide for the design and evaluation of ranking-type Delphi studies using BWS. Our approach contributes to the methodological development of ranking-type Delphi research and the rigorous application of the ranking-type Delphi Method variant. In detail, this approach enables designing a ranking with up to 22 items in a manner in which participants can reasonably rank, avoids and overcomes shortcomings of common ranking approaches, and offers a statistical procedure for an unambiguous calculation. This approach is evaluated by our own research study and can be applied in IS research, as well as in other disciplines.

4.2 Practical contribution

The dissertation contributes to practice in two ways: (1) defines the crucial role of the offshore coordinator, and (2) describes the determinants that influence knowledge transfer in a positive or negative way.

(1) For practical aspects, this dissertation defines the crucial role of the offshore coordinator, which facilitates the knowledge transfer between the client and vendor in IS offshoring initiatives. We provide indications of core tasks the offshore coordinator has to fulfill. This aspect facilitates the integration of this role within the knowledge transfer process. The identified skills offer useful guidelines that could be applied to select a qualified employee who can and will actually fulfill this crucial role. The tasks and skills and their mapping onto the UCF could further be used to specify precise job descriptions and justify pay scale classifications. Finally, we introduced aspects for the implementation of the offshore coordinator role in practice, which can be an indicator to decide how to assign this role, i.e., as the main or an additional responsibility or in part- or full-time.

(2) Another main finding of this dissertation concerns the identification, description, and ranking of determinants influencing the success or failure of knowledge transfer in IS offshoring initiatives. Overall, we identified 19 determinants of success and 20 determinants of failure that are described and ranked in order of importance. The three most important determinants of success focus on aspects of closer cooperation, while the three most important determinants of failure concern fears and fluctuation. These results help managers to better prioritize their allocation of time and resources to focus on the crucial determinants for knowledge transfer in order to achieve benefits and reduce detrimental effects. This contribution aims to increase the chances of a successful knowledge transfer. This benefit is useful for practitioners who want to start to transfer knowledge in IS offshoring initiatives as well as practitioners who have already started the knowledge transfer process, by offering ideas for refinement.

4.3 Limitations and research perspectives

There are several limitations to acknowledge in this dissertation. The two main limitations are (1) the application of theories and (2) the usage of methods.

(1) According to Grover and Lyytinen (2015, p. 271), the "dominant way of producing knowledge in information systems (IS) seeks to domesticate high-level reference theory in the form of mid-level abstractions involving generic and atheoretical information technology (IT) components. […]. This state of play has resulted in two negative consequences: the field (1) agonizes over the dearth of original and bold theorizing over IT and (2) satisfices when integrating theory with empirics by creating incommensurate mid-range models that are difficult to consolidate." The authors propose to move either toward rich data-driven research for practical use or toward bold theorizing about conceptual relationships (called blue ocean theorizing) for theoretical use.

We followed the arguments of Grover and Lyytinen (2015) and decided to position our work towards data-driven research for practical use for two reasons. First, knowledge transfer in IS offshoring initiatives is in an early stage (Strasser & Westner, 2015). Thus, explorative research is required to determine the nature of the problem that forms the basis of more conclusive quantitative-empirical research. Second, our research focuses on the identification of appropriate constructs to understand knowledge transfer in IS offshoring initiatives in practice. These results could potentially help develop a richer theory. Future research could alternatively apply design science research using our success and failure determinants to develop a procedure model. This model could also consider our findings for the offshore coordinator role.

(2) The second limitation relates to the selected ranking-type Delphi method variant. The application of BWS with ranking-type Delphi studies is novel. We contributed suggestions on how to combine BWS with Delphi by maintaining each of the methods' particular and valuable specifics. These suggestions have been successfully applied to investigate the determinants of success and failure in IS offshoring initiatives. However, it has not been fully proven that this approach is appropriate and applicable for ranking-type Delphi studies in general. Future studies should apply our approach to evaluate it comprehensively.

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1. IT-OFFSHORING

Overview

ID	Section in synopsis	Authors	Year of publication	Paper title	Journal / Conference name
1	3.1	M. Westner A. Strasser	2014	IT-Offshoring	WISU - Das Wirtschaftsstudium

Reference

Westner, M., Strasser, A. (2014): IT-Offshoring, in: WISU – das Wirtschaftsstudium, 5/14, pp. 650-652.

2. INFORMATION SYSTEMS OFFSHORING: RESULTS OF A SYSTEMATIC LITERATURE REVIEW

Overview

ID	Section in synopsis	Authors	Year of publication	Paper title	Journal / Conference name
2	3.2	A. Strasser M. Westner	2015	Information Systems Offshoring: Results of a systematic Literature Review	Journal of Information Technology Management

Reference

Strasser, A., Westner, M. (2015): Information Systems Offshoring: Results of a Systematic Literature Review. Journal of Information Technology Management, XXVI (2), pp. 70–142.

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

Overview

ID	Section in synopsis	Authors	Year of publication	Paper title	Journal / Conference name
3	3.3	A. Strasser M. Westner	2015	Knowledge Transfer in IS Offshoring: Processes, Roles, and Success Factors	Pacific Asian Conference for Information Systems, Singapore

Reference

Strasser, A., Westner, M. (2015): Knowledge Transfer in IS Offshoring: Processes, Roles, and Success Factors. PACIS 2015 Proceedings, Paper 210, Singapore.

Unpublished appendix / appendices

Source	Perspective	Main process steps	Description	Process model
Feng et al., 2010	From onshore to offshore side in a company	1. Transferring across syntactic boundary 2. Translating across semantic boundary 3. Transforming across pragmatic boundary	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. Findings: 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.	Project initiation / Knowledge centralization / Explicit knowledge impartation / Assessment of knowledge acquisition — Phase one: Transfer syntactic knowledge. Cross-team interaction / Knowledge interpretation and Assimilation / Evaluation of knowledge assimilation — Phase two: Translate semantic knowledge. Prototyping / Interest negotiating / Knowledge conversion & knowledge application → Knowledge delivered → Strategy change — Phase three: Transform Pragmatic knowledge. *Figure 3. How knowledge is delivered from onshore teams to offshore teams*
Schott, 2011	Between vendors	1. Transfer of the fundamental technological concepts 2. Transfer of practical design & implementation knowledge 3. Joint cross-vendor learning based on implementation experiences 4. Knowledge multiplication across the global delivery network	While prior research repeatedly emphasized the importance of client-vendor knowledge transfer in global ISD outsourcing projects, there is still very little understanding about the knowledge transfer between vendor companies. However, due to the increasing involvement of multiple vendors within a global ISD project, the topic becomes vital. Thus, the purpose of this paper is to analyze how and through which factors vendor-vendor knowledge transfer is shaped. As research on this topic is scarce, we applied an exploratory in-depth single-case study as research approach. The case comprises a global ISD project initiated by a large German bank involving several globally distributed vendors. For data collection and analysis, techniques from grounded theory method were adopted. Findings: The analysis of our case suggests that knowledge transfer between vendors runs through four stages and is influenced through various factors relating to certain characteristics of the knowledge receiver, the structure of the knowledge to be transferred and organizational characteristics of the involved parties. The paper concludes by offering theoretical and practical implications.	Stage 1: Transfer of the fundamental technological concepts. Stage 2: Transfer of practical design & implementation knowledge. Stage 3: Joint cross-vendor learning based on implementation experiences. Stage 4: Knowledge multiplication accross the global delivery network. *Figure 1. Stage-model of vendor-vendor knowledge transfer in global ISD outsourcing projects with multiple vendors*
Chen & McQueen, 2010	US to China	- **Struktured KT-process:** 1. initiation 2. implementation 3. ramp-up 4. integration - **Unstructured KT-processes (occur in daily work):** 1. unstructured copy 2. unstructured adaption 3. unstructured fusion The degree of knowledge taciness, complexity and ambiguity affects the selection of knowledge transfer approaches	Purpose – This paper aims to focus on the relationships between the levels of knowledge and the type of knowledge transfer approaches, and the relationships between the types of knowledge and the knowledge transfer approaches which were adopted in a study of knowledge transfer from a US-based technical support center to an offshore support center in China. Design/methodology/approach – The research was conducted as an interpretive case study. Three techniques (i.e. document review, participant observation, and semi-structured interviews) were employed for data collection in the field. Findings – The findings indicate that the lower the difficulty the recipient will have in acquiring tacit and complex types of knowledge, and the more formal structured knowledge transfer approach the recipient will need to adopt. The results identify that "structured transfer stages" was used by novices to transfer embrained and encoded knowledge, while "unstructured copy" was widely adopted by advanced beginners to transfer encoded and embodied knowledge, "unstructured adaptation" was mainly utilized by those at the competence level to transfer embodied and embedded knowledge, and "unstructured fusion" was preferred by recipients at the proficiency level to transfer embodied and embedded knowledge as well.	ITP 23,1 / 74. Knowledge transfer type adoption model. Absorptive and Retentive capacities: High / Low. Knowledge levels: Fundamental, Elementary, Intermediate, Advanced — Novice, Advanced Beginner, Competence, Proficiency. Knowledge types: Embrained & Encoded, Encoded & Embodied, Embodied & Embedded, Embodied & Embedded. Knowledge transfer approaches: Structured Transfer Stages, Unstructured Copy, Unstructured Adaptation, Unstructured Fusion. Facilitate. *Figure 1.*

Source	Description	Perspective	Main process steps	Process model
Chen 2013 et al.	This study investigates knowledge transfer and knowledge building at three technical support centers (TSCs)which have been offshored to China. Utilizing an interpretive case study approach, the study examined how organizational knowledge was transferred from the US-based onshore TSC to a China-based offshore TSC, and how China-based knowledge was built and expanded in a dynamic changing business context. A model is presented which was developed from qualitative analysis of the field data, and this model aids understanding of how knowledge was transferred and built at the individual level, the group level and the organization level at the China-based offshored TSC. Findings: The shared mental models of the people in the organizations helped individual knowledge to be linked to group knowledge, and then to organizational knowledge. The ongoing informal communication, close interaction and coordination between onshore and offshore group members facilitated the knowledge transfer from onshore to offshore TSC. The model presented also demonstrates the knowledge flow through knowledge intermediaries in the offshored knowledge transfer and building processes, and provides new insights into organizational learning in an offshored business context.	US to China	**SECI process at:** - individual, - group, and - organizational level with activities.	*(process model figure – "Three levels of the SECI spiral in the organizational learning process.")*
Chua 2008	Offshore sourcing is the trend where companies look for cheaper offshore resource options to reduce their baseline costs. This involves the retrenchment of more expensive onshore resources to be replaced with cheaper offshore resources. A key activity is the transfer of knowledge from the onshore resources to the offshore resources. This paper is written from an organizational learning perspective, looking at how a global IS department in a multinational bank went about transferring its business application support and development experiences to another insourced location. Specifically, we examine how knowledge is transferred for the five IS body of knowledge (BOK) areas, namely, technology, application domain, IS application, organizational and IS development process knowledge. We find that whilst some areas of the IS BOK are easily grafted, some require intense vicarious and experiential learning using rich media, whilst others are more difficult to transfer. The findings extend the literature on knowledge transfer and organizational learning in the context of the IS BOK.	U.K., Hong Kong, etc. to India and Malaysia	**According to Szulanski:** 1. Initiation and implementation 2. Ramp-up 3. Integration stage at organizational, team, and individual level	*(Table 2 – Summary of events, with columns Initiation and Implementation, Ramp-up, Integration across Organization level, Team level, Individual level.)*
Szulanski 2000	Even though intrafirm transfers of knowledge are often laborious, time consuming, and difficult, current conceptions treat them as essentially costless and instantaneous. When acknowledged, difficulty is an anomaly in the way transfers are modeled rather than a characteristic feature of the transfer itself. One first step toward incorporating difficulty in the analysis of knowledge transfer is to recognize that a transfer is not an act, as typically modeled, but a process. This article offers a process model of knowledge transfer. The model identifies stages of transfer and factors that are expected to correlate with difficulty at different stages of the transfer. The general expectation is that factors that affect the opportunity to transfer are more likely to predict difficulty during the initiation phase, whereas factors that affect the execution of the transfer are more likely to predict difficulty during subsequent implementation phases. Measures of stickiness are developed for each stage of the transfer to explore the predictive power of different factors at different stages of the process. A cross-sectional analysis of primary data collected through a two-step survey of 122 transfers of organizational practices within eight firms illustrates the applicability of the model and suggests several issues for further research.	generalistic	1. Initiation 2. Implementation 3. Ramp-up 4. Integration stage	FIG. 1. The process of knowledge transfer.

Client-vendor knowledge transfer

Process models	Process steps	Main activities	Research approach	Theory	Source
Three phases of knowledge delivery	Transfer syntactic knowledge	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. By evaluation for the knowledge acquisition, onshore managers check whether the explicit knowledge delivered in the common lexicon is sufficiently acquired by offshore members.	Single case study	Framework of knowledge boundary according to Carlile (2002)	Feng et al. (2010)
	Translate semantic knowledge	Cross-team interaction and interpretation to create the common meaning between onshore teams and offshore teams. Knowledge interpretation and assimilation between offshore and onshore members. By evaluation of knowledge assimilation, offshore managers check whether the tacit knowledge delivered via the common meaning is sufficiently assimilated by offshore members.			
	Transform pragmatic knowledge	By prototyping and interest negotiation, the common interest between onshore teams and offshore teams are created. Knowledge conversation and knowledge application between offshore and onshore members.			
Structured knowledge transfer process	Initiation	Searching for qualified knowledge resource people at the client side with the necessary cultural, technical, and business process knowledge.	Case study	Process modell according to Szulanski (2000) Types of knowledge according to Lam (2000) Levels of knowledge Dreyfus et al. (1986)	Chen et al. (2010)
	Implementation	Transfer embrained and encoded product knowledge so that novices could understand the basic concepts required.			
	Ramp-up	Transfer of encoded and embodied knowledge in order that the knowledge recipient applies the acquired knowledge.			
	Integration	Transfer encoded and embodied knowledge to get novices qualified to perform the basic functions required.			
Unstructured knowledge transfer process	Unstructured copy	Transfer of encoded and embodied knowledge to get advanced beginners familiar with common issues and improve their problem-solving skills and speed.			
	Unstructured adaption	Transfer of embodied and embedded knowledge adopted by advanced beginners to improve problem solving flexibility, efficiency and effectiveness.			
	Unstructured fusion	Transfer of embodied and embedded knowledge utilized by those at the competence level to create new knowledge and to solve tough problems.			

Process models	Process steps	Main activities	Research approach	Theory	Source
SECI process at individual level	Socialization	Onshore mentors were transferred to the offshore center to build shared understanding of technology, work processes, and how to handle customer complaints with offshore Engineers. Offshored engineers socialized with onshore mentors through team building activities. Individual offshored engineers worked with colleagues and onshore mentors in the same work environment, and improved his/her knowledge and skills through observation, imitation and practice.	Case study	SECI spiral model by Nonaka (1994)	Chen et al. (2013)
	Externalization	Through conversations and interactions with others, an individual's insight or idea could be explained to others because of the development of a shared language. Engages in dialog, or share his/her knowledge in a group such as a weekly group knowledge sharing meeting.			
	Combination	Individual engineers collects explicit knowledge from many different sources. Edits and combines them with his/her personal knowledge and incorporates it into personal systemic knowledge.			
	Internalization	Individual engineers trial and apply the acquired explicit knowledge in their daily work such as solving customers' problems on the phone. The engineers continually challenges their old mental models through solving different problems in different situations in their daily work.			
SECI process at group level	Socialization	Working collaboratively with group members to solve customer problems. Socialize with different group leaders/technical leaders in the group leaders/technical leaders meetings. Attending organizational training program with other technical leaders/group leaders.			
	Externalization	Convert group's experiential knowledge into the group's common terminology, and articulates it as the group's conceptual knowledge. Group/technical leaders share new knowledge and solutions in the group leader/technical leader meeting.			
	Combination	The corporate knowledge advisor collected information and knowledge from groups and put it together in a technical support engineer handbook and local organizational knowledge repository. Edit the acquired knowledge to meet engineers needs from offshore side.			
	Internalization	The new knowledge from the group, technical leaders, other group engineers, and the group and local organizational knowledge repository were leveraged for on-the-job-training and group knowledge sharing meetings.			

Process models	Process steps	Main activities	Research approach	Theory	Source
SECI process at organizational level	Socialization	Working with group technical leaders to solve difficult customer problems. Socialize with the corporate knowledge advisers and senior technicians from different branches through global senior technician meetings, site visits, and senior technicians overseas training.			
	Externalization	The organizational conceptual knowledge such as "best practice" are shared and transferred by the corporate knowledge adviser through dialogs with other branch corporate knowledge advisers.			
	Combination	The corporate knowledge adviser captured and acquired explicit and tacit knowledge from organization, synthesized the knowledge into the corporate knowledge repository. Standardization of processes and learning among offshored and onshore engineers.			
	Internalization	The new corporate knowledge transferred and shared between onshore and offshore centers was gradually applied and embodied in the offshored engineers' daily work.			
Knowledge transfer processes at the organizational, team and individual level	Initiation and implementation	Creates transition guide for all teams to follow. Decides which teams to send offshore and the percentage of team composition onshore and offshore. Onshore project manager plans knowledge transfer schedule, content of training and assigns the onshore resources. Offshore project manager looks for suitably qualified new recruits based on technical and application domain knowledge requirements. Onshore team members prepare training material in their own area of expertise. Offshore team members study existing documentation.	Case study	Five IS body of knowledge (BOK) areas Process modell according to Szulanski (2000)	Chua et al. (2008)
	Ramp-up	Intensive knowledge transfer for all through presentations, quizzes, support simulation, playback, and repeat the above but for 20% of selected senior staff for analysis and design specialization.			
	Integration	Reorganization into one team, to ensure better cohesion and continued learning between the onshore and offshore teams. Onshore and offshore project managers do a team readiness assessment together. Quality manager audits the team transition process and checks that the business users are satisfied. Oral tests given to each team member to gauge deeper understanding and absorption of processes, functions and features.			

vendor-vendor knowledge transfer

Process model	Process steps	Main activities	Research approach	Theory	Source
Stage model of vendor-vendor knowledge transfer	Transfer of the fundamental technological concepts	Detailed presentations of the architectural framework, the underlying theory, and the corresponding design principles.	Single case study	Adopt a theoretical framework of interorganizational knowledge transfer from the general management domain	Schott (2011)
	Transfer of practical design and implementation knowledge	Practitioner-oriented transfer of knowledge including examples to the particular setting of the project and the individual needs.			
	Joint cross-vendor learning based on implementation experiences	Intense involvement of the party the knowledge is transferred to by ensuring individual interactions between programmers and technical experts of both vendor companies.			
	Knowledge multiplication across the global delivery network	Transferring knowledge to all developers engaged in the project which could not participate personally in the knowledge transfer activities.			

4. DELPHI METHOD VARIANTS IN INFORMATION SYSTEMS RESEARCH: TAXONOMY DEVELOPMENT AND APPLICATION

Overview

ID	Section in synopsis	Authors	Year of publication	Paper title	Journal / Conference name
4	3.4	A. Strasser	2017	Delphi Method Variants in Information Systems Research: Taxonomy Development and Application	The Electronic Journal of Business Research Methods
			Earlier version: 2016	Delphi Method Variants in IS Research: A Taxonomy Proposal	Pacific Asian Conference for Information Systems, Taiwan

References

Strasser, A. (2017): Delphi Method Variants in Information Systems Research: Taxonomy Development and Application, in: The Electronic Journal of Business Research Methods (EJBRM), Volume 15, Issue 2, pp. 120-132.

Strasser, A. (2016): Delphi Method Variants in IS Research: A Taxonomy Proposal, in: PACIS 2016 Proceedings. Paper 224, Taiwan.

5. DESIGN AND EVALUATION OF RANKING-TYPE DELPHI STUDIES USING BEST-WORST-SCALING

Overview

ID	Section in synopsis	Authors	Year of publication	Paper title	Journal / Conference name
5	3.5	A. Strasser	2019	Design and Evaluation of ranking-type Delphi studies using best-worst-scaling	Technology Analysis & Strategic Management

Reference

Strasser, A. (2019): Design and evaluation of ranking-type Delphi studies using best-worst-scaling. Technology Analysis & Strategic Management, 16 (2), pp. 1–10, https://doi.org/10.1080/09537325.2018.1521956

6. KNOWLEDGE TRANSFER IN IS OFFSHORING: A DELPHI STUDY OF THE OFF-SHORE COORDINATOR ROLE

Overview

ID	Section in synopsis	Authors	Year of publication	Paper title	Journal / Conference name
6	3.6	A. Strasser M. Westner S. Strahringer	2019	Knowledge Transfer in IS Offshoring: A Delphi Study of the Offshore Coordinator Role	Journal of Systems and Information Technology

Reference

Strasser, A., Westner, M., Strahringer, S. (2019): Knowledge Transfer in IS Offshoring: A Delphi Study of the Offshore Coordinator Role, in: Journal of Systems and Information Technology, 21/1, pp. 36 - 62, https://doi.org/10.1108/JSIT-01-2018-0008

Unpublished appendix / appendices

Knowledge Transfer in Information Systems (IS) Offshoring

TECHNISCHE UNIVERSITÄT DRESDEN

OTH OSTBAYERISCHE TECHNISCHE HOCHSCHULE REGENSBURG

The purpose of this questionnaire is to solicit your input on **knowledge transfer in information systems (IS) offshoring**, especially about the **tasks and skills of a central role in the transfer of knowledge** as well as **critical knowledge transfer factors**. We consider IS off- and IS nearshoring. For simplicity we only use the term IS offshoring. We define IS offshoring as *the transfer of IS services from Germany to a service provider outside the service consumer's home country. IS services comprise all common services, i.e., infrastructure, application development & operations, and business processes*.

The questionnaire consists of 3 parts with 10 questions:

1. General information about your expertise
2. Role of the Offshore Coordinator
3. Critical knowledge transfer factors in IS offshoring

Answering these 10 questions will take approximately 20 minutes. All data will be handled confidentially and will only be published in an anonymous and aggregated fashion. The protection of data privacy is fully guaranteed. Thank you for your input and your cooperation!

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Next

[1] GENERAL INFORMATION ABOUT YOUR EXPERTISE

In which industries did you gather your IS offshoring experience? (Multiple selection possible)

- [ ] Aerospace engineering
- [ ] Automotive engineering
- [ ] Building and construction
- [ ] Chemicals and pharmaceuticals
- [ ] Electrical engineering and electronics
- [ ] Energy and environmental technology
- [ ] Financial services
- [ ] Health and care
- [ ] IT and telecommunications
- [ ] Mechanical engineering
- [ ] Precision engineering and optics
- [ ] Steel and metal industry
- [ ] Other: _____

Which position(s) do or did you hold in IS offshoring projects? (Multiple selection possible)

- [ ] Project manager
- [ ] Product owner
- [ ] Executive manager
- [ ] Software developer
- [ ] Business analyst
- [ ] Scrum master
- [ ] Test manager
- [ ] Consultant
- [ ] Offshore coordinator
- [ ] Other: _____

How many years of experience do you have with IS offshoring projects?

- ○ < 5 years
- ○ 5-7 years
- ○ 8-10 years
- ○ 11-14 years
- ○ Over 15 years

Please enter your comment here:

Is your experience mainly based on IS near- or IS offshoring projects?

- ○ IS nearshoring
- ○ IS offshoring
- ○ both IS off- and IS nearshoring

[2] OFFSHORE COORDINATOR

In accordance to our definition, the Offshore Coordinator connects the onshore and offshore organization and facilitates the knowledge transfer process. The tasks include, among others, coordinating both teams, cultivating and intensifying the relationship, and overcoming communication barriers.

Was the role mentioned above taken over by a person as his or her main responsibility or by a person with mainly other responsibilities?

❶ This question is mandatory

- ○ Role assigned to person on a full-time position as main responsibility
- ○ Role assigned to person on a part-time position as main responsibility
- ○ Role assigned to person on a full-time position as additional responsibility
- ○ Role assigned to person on a part-time position as additional responsibility

Please enter your comment here:

Answer 1 or 2:

[2] OFFSHORE COORDINATOR

How is this position typically referred to?

Answer 3 or 4:

[2] OFFSHORE COORDINATOR

Which position typically takes on this role as an additional responsibility in IS offshoring projects?

50%

[2] OFFSHORE COORDINATOR

The following table provides a role definition and presents the core tasks and necessary skills of an Offshore Coordinator based on IS offshoring literature.

Synonyms	Boundary Spanner, Bridge System Engineer, Gate Keeper, Middle Man
Definition	The Offshore Coordinator connects the onshore and offshore organization and facilitates the knowledge transfer processes.
Tasks	(1) *Coordinating both teams*: The Offshore Coordinator initiates activities that ensure information exchange and building of communication networks. (2) *Cultivating and intensifying the relationship*: The Offshore Coordinator facilitates building of mutual trust and provides support to cultivate relationship. (3) *Eliminating the lack of equivalence*: By improving individual capacity, the Offshore Coordinator decreases the lack of equivalence in individual competences such as IT skills. (4) *Filling cultural gaps*: The Offshore Coordinator helps to bridge cultural gaps and improves relationships between the onshore and offshore organization. (5) *Overcoming communication barriers*: The Offshore Coordinator removes communication barriers and improves mutual understanding between the participants.
Skills	(1) *Interpersonal and communication skills*: are essential to facilitate the communication-intensive knowledge transfer process which is characterized by misunderstandings. (2) *Distinctive skills and attributes*: beeing able to perform in multiple dimensions, e.g., leader, business systems thinker, contract facilitator, or translator/interpreter. (3) *IT-skills*: are required due to the IT context of the endeavor itself. (4) *Higher education*: a background of higher education is useful as preparation for the challenging tasks. (5) *Work experience*: several years of work experience is necessary to effectively fulfill this demanding role.

Based on your professional experience, what are the main tasks of an Offshore coordinator?

Please note: The following response fields are prefilled with the above-mentioned literature results for illustration purposes only. If you consider the above-mentioned tasks relevant, please fill in the associated number(s) of the above-mentioned tasks into the text field(s). You can add new tasks as well. The numbers above or the order you use is not associated with any priority.

Please give a brief explanation

Task	e.g., coordinating both teams	ensure information exchange and building of communication networks
Task	e.g., cultivating and intensifing the relationship	facilitates building of mutual trust and provides suppor: to cultivate relationship
Task	e.g., eliminating the lack of equivalence	decreases the lack of equivalence in individual competences such as IT skills
Task	e.g., filling cultural gaps	helps to bridge cultural gaps and improves relationships
Task	e.g., overcoming communication barriers	removes communication barriers and improves mutual understanding
Task	...	...
Task	...	...
Task	...	...
Task	...	...
Task	...	...

[2] OFFSHORE COORDINATOR

Based on your professional experience, which skills are necessary to perform the Offshoring Coordinator role?

Please note: The following response fields are prefilled with the above-mentioned literature results for illustration purposes only. If you consider the above-mentioned skills relevant, please fill in the associated number(s) of the above-mentioned skills into the text field(s). You can add new skills as well. The numbers above or the order you use is not associated with any priority.

Please give a brief explanation

Skill	e.g., interpersonal and communication skills	to facilitate the communication-intensive knowledge transfer process
Skill	e.g., distinctive skills and attributes	to perform multiple dimensions, e.g., leader or business systems thinker
Skill	e.g., IT-skills	are required due to the IT context of the endeavor itself
Skill	e.g., higher education	a background of higher education is useful as preparation for the challenging tasks
Skill	e.g., work experience	several years of work experience is necessary to effectively fulfill this demanding role
Skill	...	...
Skill	...	...
Skill	...	...
Skill	...	...
Skill	...	...

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Knowledge Transfer in Information Systems (IS) Offshoring

TECHNISCHE UNIVERSITÄT DRESDEN

OTH OSTBAYERISCHE TECHNISCHE HOCHSCHULE REGENSBURG

The purpose of the second round of the questionnaire is to solicit your input on the overall results of the first round, especially about the responsibilities and the tasks and skills of the Offshore Coordinator as well as the critical knowledge transfer factors.

The questionnaire consists of 3 parts with 7 question pages:

1. Responsibilties of the Offshore Coordinator
2. Tasks and Skills of the Offshore Coordinator
3. Critical knowledge transfer factors in IS offshoring

Answering these 7 question pages will take approximately 20 minutes. All data will be handled confidentially and will only be published in an anonymous and aggregated fashion. The protection of data privacy is fully guaranteed. Thank you for your input and your cooperation!

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0%

1. RESPONSIBILITIES OF THE OFFSHORE COORDINATOR

Please rate the extent to which you agree or disagree with the following statements according to the responsibilities of the Offshore Coordinator role.

	strongly not agree	not agree	neither / nor	agree	strongly agree
The larger the project, the more likely the tasks of an Offshore Coordinator are assigned to a person on a full-time position as his/her main responsibility.	○	○	○	○	○
If multiple IS offshoring projects have to be supported simultaneously, the more likely the tasks of an Offshore Coordinator are assigned to a person on a full-time position as his/her main responsibility.	○	○	○	○	○
The more experience a company has with IS offshoring, the more likely the tasks of an Offshore Coordinator can be assigned to a person on a part-time position or to a person with mainly other responsibilities.	○	○	○	○	○
The more experience the person assigned to the tasks of an Offshore Coordinator has, the more likely the tasks of an Offshore Coordinator can be assigned to a person on a part-time position or to a person with mainly other responsibilities.	○	○	○	○	○
If the tasks of an Offshore Coordinator are assigned to a person on a full-time position as his/her main responsibility, the success of the knowledge transfer will improve significantly.	○	○	○	○	○
In my experience, the tasks of an Offshore Coordinator are generally assigned to an existing role as an additional responsibiliy, e.g. project manager or service manager.	○	○	○	○	○

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14%

2. TASKS OF THE OFFSHORE COORDINATOR ROLE

Please rate the extent to which you agree or disagree with the following statements according to the tasks of the Offshore Coordinator role.

	strongly not agree	not agree	neither / nor	agree	strongly agree
Serve as point of contact for all non-technical and all project management related topics within the cooperation.	○	○	○	○	○
Develop and communicate a project plan for migration and processes for operations.	○	○	○	○	○
Organize regulary on-site visits and events at customer or partner site for team members and for themselves to maintain relationships.	○	○	○	○	○
Ensure vendor management of all 3rd parties involved.	○	○	○	○	○
Making sure that requirements are understood by holding conference calls or video calls to explain the work.	○	○	○	○	○
Help to bridge cultural gaps, e.g., proactively educate both parties on cultural differences.	○	○	○	○	○
Check regularly that the knowledge base is up to date to be in a position to change the provider one day.	○	○	○	○	○
Define measurements (key performance indicators) and control/monitor them.	○	○	○	○	○
Ensure service delivery quality in adherence to all contractually agreed SLAs.	○	○	○	○	○
Initiate activities that ensure the exchange of information and building of communication networks.	○	○	○	○	○
Gather information on services to, e.g., build a knowledge base.	○	○	○	○	○
Facilitate the building of mutual trust and open communication between teams.	○	○	○	○	○
Create a culture of mutual understanding and identify where mistakes might occur.	○	○	○	○	○
Support the knowledge transfer actively and take actions if there are gaps.	○	○	○	○	○
Manage expectations on both sides.	○	○	○	○	○
Create service performance reports for relevant stakeholders.	○	○	○	○	○
Reduce prejudices on both sides.	○	○	○	○	○
Remove communication barriers and improve mutual understanding between participants.	○	○	○	○	○
Manage both sides (on- and offshore team) according to offshore targets.	○	○	○	○	○
Define and clarify roles and responsibilities of on- and offshore teams.	○	○	○	○	○
Deal with conflicts proactively and manage escalations.	○	○	○	○	○
Provide support to improve relationships between the onshore and offshore organization.	○	○	○	○	○
Streamline the way of documentation and handovers.	○	○	○	○	○
Implement clear processes in order to hand over work from one team to another using workflow tools like SharePoint, Jira, ClearQuest, etc.	○	○	○	○	○
Develop communication rules and channels including an agreed wording for all main topics to clarify misunderstandings.	○	○	○	○	○

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28%

3. SKILLS OF THE OFFSHORE COORDINATOR ROLE

Please rate the extent to which you agree or disagree with the following statements according to the skills of the Offshore Coordinator role.

	strongly not agree	not agree	neither / nor	agree	strongly agree
Processual and methodological competence, i.e., knowing and understanding frameworks like ITIL, CMMI, Scrum.	○	○	○	○	○
Interpersonal and communication skills, i.e., facilitating the communication-intensive knowledge transfer process which is characterized by misunderstandings.	○	○	○	○	○
Work experience, i.e., several years of international work experience in the IS offshoring domain.	○	○	○	○	○
Networking-competences, i.e., knowing the right people for the job to be done and ability to win them over for projects.	○	○	○	○	○
Project management skills, i.e., planning of tasks, coordinating of team/s, setting priorities, delegating, coping with changes, and preparing management reports.	○	○	○	○	○
To be open minded, i.e., allowing ideas and suggestions and trying to implement them in processes.	○	○	○	○	○
Higher education degree, i.e., bachelor or master degree.	○	○	○	○	○
Capacity for teamwork, i.e., ability to work in a team.	○	○	○	○	○
Presentation skills, i.e., presenting information clearly and effectively.	○	○	○	○	○
Economic skills, i.e., understanding of international contracts and relevant key figures.	○	○	○	○	○
Analytical skills, i.e., conceptual ability to think creatively and understand complicated or abstract ideas as well as being able to develop a clear picture of the current state and how to improve and develop it.	○	○	○	○	○
Leadership, i.e., ability to manage team.	○	○	○	○	○
Domain skills, i.e., understanding the underlying business processes involved in order to better understand the client view.	○	○	○	○	○
Listen, i.e., being able to listen to people and understand what they mean etc., making sure that you do not miss a single good idea or legitimate doubt.	○	○	○	○	○
Conflict ability, i.e., ability to handle conflicts.	○	○	○	○	○
IT-skills, i.e., understanding the technical issues discussed between both parties.	○	○	○	○	○
Patience, i.e., the ability to remain calm and not become annoyed when dealing with problems or difficult people.	○	○	○	○	○
Intercultural skills and experiences, i.e., understanding of different cultural behaviors, sensitivities and communication styles as well as experiences in collaborating with different cultures.	○	○	○	○	○
Professional language skills, i.e., professional english.	○	○	○	○	○
Multi language capabilites, i.e., language of the offshore location.	○	○	○	○	○
Multi-role capabilities, i.e., being able to perform in multiple dimensions, e.g., leader, business systems thinker, contract facilitator, or translator/interpreter.	○	○	○	○	○

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Knowledge Transfer in Information Systems (IS) Offshoring

The purpose of the third round of the questionnaire is to solicit your input on the overall results of the second round, especially about the responsibilities and the tasks and skills of the Offshore Coordinator as well as the critical knowledge transfer factors.

The questionnaire consists of 3 parts with 7 question pages:

1. Responsibilties of the Offshore Coordinator (page 1)
2. Tasks and Skills of the Offshore Coordinator (page 2 and page 3)
3. Critical knowledge transfer factors in IS offshoring (page 4 - page 7)

Answering these 7 question pages will take approximately 20 minutes. All data will be handled confidentially and will only be published in an anonymous and aggregated fashion. The protection of data privacy is fully guaranteed. Thank you for your input and your cooperation!

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Next

1. RESPONSIBILITIES OF THE OFFSHORE COORDINATOR

Characteristics	Total number of participants	Strongly agree	Agree	Neither / nor	Not agree	Strongly not agree	Your response in round 2	Your response in round 3 *	Comment
The larger the project, the more likely the tasks of an Offshore Coordinator are assigned to a person on a full-time position as his/her main responsibility.	40 of which	22	15	2	0	1	Strongly agree	Please select	Optional: Please comment your re-ponse
If multiple IS offshoring projects have to be supported simultaneously, the more likely the tasks of an Offshore Coordinator are assigned to a person on a full-time position as his/her main responsibility.	40 of which	24	11	3	0	2	Strongly agree	Please select	Optional: Please comment your re-ponse
The more experience a company has with IS offshoring, the more likely the tasks of an Offshore Coordinator can be assigned to a person on a part-time position or to a person with mainly other responsibilities.	40 of which	1	8	11	18	2	Not agree	Please select	Optional: Please comment your re-ponse
The more experience the person assigned to the tasks of an Offshore Coordinator has, the more likely the tasks of an Offshore Coordinator can be assigned to a person on a part-time position or to a person with mainly other responsibilities.	40 of which	0	12	13	12	3	Neither / nor	Please select	Optional: Please comment your re-ponse
If the tasks of an Offshore Coordinator are assigned to a person on a full-time position as his/her main responsibility, the success of the knowledge transfer will improve significantly.	40 of which	11	21	5	3	0	Strongly agree	Please select	Optional: Please comment your re-ponse
In my experience, the tasks of an Offshore Coordinator are generally assigned to an existing role as an additional responsibiliy, e.g. project manager or service manager.	40 of which	12	16	7	4	1	Neither / nor	Please select	Optional: Please comment your re-ponse

* mandatory field

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2. TASKS OF THE OFFSHORE COORDINATOR

| Characteristics	Total number of participants	Strongly agree	Agree	Neither / nor	Not agree	Strongly not agree	Your response in round 2	Your response in round 3 *	Comment
Serve as point of contact for all non-technical and all project management related topics within the cooperation.	40 of which	14	23	1	1	1	Strongly agree	Please select	Optional: Please comment your response
Develop and communicate a project plan for migration and processes for operations.	40 of which	2	22	12	3	1	Agree	Please select	Optional: Please comment your response
Organize regulary on-site visits and events at customer or partner site for team members and for themselves to maintain relationships.	40 of which	5	25	6	4	0	Agree	Please select	Optional: Please comment your response
Ensure vendor management of all 3rd parties involved.	40 of which	7	14	12	6	1	Neither / nor	Please select	Optional: Please comment your response
Making sure that requirements are understood by holding conference calls or video calls to explain the work.	40 of which	14	17	6	3	0	Agree	Please select	Optional: Please comment your response
Help to bridge cultural gaps, e.g., proactively educate both parties on cultural differences.	40 of which	22	13	4	1	0	Neither / nor	Please select	Optional: Please comment your response
Check regularly that the knowledge base is up to date to be in a position to change the provider one day.	40 of which	7	25	5	3	0	Agree	Please select	Optional: Please comment your response
Define measurements (key performance indicators) and control/monitor them.	40 of which	8	17	5	9	1	Strongly agree	Please select	Optional: Please comment your response

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Statement	40 of which					Selected
Ensure service delivery quality in adherence to all contractually agreed SLAs.	13	14	6	6	1	Strongly agree
Initiate activities that ensure the exchange of information and building of communication networks.	9	26	2	2	1	Agree
Gather information on services to, e.g., build a knowledge base.	5	18	12	4	1	Strongly agree
Facilitate the building of mutual trust and open communication between teams.	19	19	1	1	0	Strongly agree
Create a culture of mutual understanding and identify where mistakes might occur.	19	18	1	1	1	Strongly agree
Support the knowledge transfer actively and take actions if there are gaps.	15	21	2	1	1	Strongly agree
Manage expectations on both sides.	20	15	4	0	1	Strongly agree
Create service performance reports for relevant stakeholders.	5	17	11	6	1	Strongly agree
Reduce prejudices on both sides.	14	19	4	2	1	Strongly agree

Statement		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Result		Comment
Remove communication barriers and improve mutual understanding between participants.	40 of which	19	15	5	1	0	Strongly agree	Please select	Optional: Please comment your response
Manage both sides (on- and off-shore team) according to offshore targets.	40 of which	5	21	6	7	1	Strongly agree	Please select	Optional: Please comment your response
Define and clarify roles and responsibilities of on- and offshore teams.	40 of which	11	17	10	2	0	Agree	Please select	Optional: Please comment your response
Deal with conflicts proactively and manage escalations.	40 of which	22	12	6	0	0	Strongly agree	Please select	Optional: Please comment your response
Provide support to improve relationships between the onshore and offshore organization.	40 of which	14	22	3	1	0	Strongly agree	Please select	Optional: Please comment your response
Streamline the way of documentation and handovers.	40 of which	8	22	9	1	0	Agree	Please select	Optional: Please comment your response
Implement clear processes in order to hand over work from one team to another using workflow tools like SharePoint, Jira, ClearQuest, etc.	40 of which	16	15	7	2	0	Strongly agree	Please select	Optional: Please comment your response
Develop communication rules and channels including an agreed wording for all main topics to clarify misunderstandings.	40 of which	14	21	5	0	0	Strongly agree	Please select	Optional: Please comment your response

mandatory field

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3. SKILLS OF THE OFFSHORE COORDINATOR

Characteristics	Total number of participants	Strongly agree	Agree	Neither / nor	Not agree	Strongly not agree	Your response in round 2	Your response in round 3 *	Comment
Processual and methodological competence, i.e., knowing and understanding frameworks like ITIL, CMMI, Scrum.	40 of which	10	21	8	0	1	Strongly agree	Please select	Optional: Please comment your reponse
Interpersonal and communication skills, i.e., facilitating the communication-intensive knowledge transfer process which is characterized by misunderstandings.	40 of which	26	12	1	0	1	Strongly agree	Please select	Optional: Please comment your reponse
Work experience, i.e., several years of international work experience in the IS offshoring domain.	40 of which	11	26	1	1	1	Strongly agree	Please select	Optional: Please comment your reponse
Networking-competences, i.e., knowing the right people for the job to be done and ability to win them over for projects.	40 of which	14	17	5	3	1	Strongly agree	Please select	Optional: Please comment your reponse
Project management skills, i.e., planning of tasks, coordinating of team/s, setting priorities, delegating, coping with changes, and preparing management reports.	40 of which	12	24	3	0	1	Strongly agree	Please select	Optional: Please comment your reponse
To be open minded, i.e., allowing ideas and suggestions and trying to implement them in processes.	40 of which	18	18	3	0	1	Strongly agree	Please select	Optional: Please comment your reponse
Higher education degree, i.e., bachelor or master degree.	40 of which	6	11	17	5	1	Strongly agree	Please select	Optional: Please comment your reponse

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Skill		Strongly agree					Strongly agree		Optional: Please comment your response
Capacity for teamwork, i.e., ability to work in a team.	40 of which	21	14	4	0	1	Strongly agree	Please select	Optional: Please comment your response
Presentation skills, i.e., presenting information clearly and effectively.	40 of which	13	22	5	0	0	Strongly agree	Please select	Optional: Please comment your response
Economic skills, i.e., understanding of international contracts and relevant key figures.	40 of which	5	18	14	3	0	Strongly agree	Please select	Optional: Please comment your response
Analytical skills, i.e., conceptual ability to think creatively and understand complicated or abstract ideas as well as being able to develop a clear picture of the current state and how to improve and develop it.	40 of which	9	22	8	1	0	Strongly agree	Please select	Optional: Please comment your response
Leadership, i.e., ability to manage team.	40 of which	20	16	3	0	1	Strongly agree	Please select	Optional: Please comment your response
Domain skills, i.e., understanding the underlying business processes involved in order to better understand the client view.	40 of which	6	23	8	3	0	Strongly agree	Please select	Optional: Please comment your response
Listen, i.e., being able to listen to people and understand what they mean etc., making sure that you do not miss a single good idea or legitimate doubt.	40 of which	18	16	6	0	0	Strongly agree	Please select	Optional: Please comment your response
Conflict ability, i.e., ability to handle conflicts.	40 of which	17	20	3	0	0	Strongly agree	Please select	Optional: Please comment your response
IT-skills, i.e., understanding the technical issues discussed between both parties.	40 of which	6	21	10	3	0	Strongly agree	Please select	Optional: Please comment your response

Patience, i.e., the ability to remain calm and not become annoyed when dealing with problems or difficult people.	40 of which	17	18	4	1	0	Strongly agree	Please select	Optional: Please comment your response
Intercultural skills and experiences, i.e., understanding of different cultural behaviors, sensitivities and communication styles as well as experiences in collaborating with different cultures.	40 of which	25	13	2	0	0	Strongly agree	Please select	Optional: Please comment your response
Professional language skills, i.e., professional english.	40 of which	26	12	2	0	0	Strongly agree	Please select	Optional: Please comment your response
Multi language capabilites, i.e., language of the offshore location.	40 of which	4	12	14	8	2	Strongly agree	Please select	Optional: Please comment your response
Multi-role capabilities, i.e., being able to perform in multiple dimensions, e.g., leader, business systems thinker, contract facilitator, or translator/interpreter.	40 of which	10	15	7	7	1	Strongly agree	Please select	Optional: Please comment your response

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7. DETERMINANTS OF SUCCESS AND FAILURE OF KNOWLEDGE TRANSFER IN IS OFFSHORING: A RANKING-TYPE DELPHI STUDY

Overview

ID	Section in synopsis	Authors	Year of publication	Paper title	Journal / Conference name
7	3.7	A. Strasser S. Strahringer M. Westner	in press	Determinants of Success and Failure of Knowledge Transfer in IS Offshoring: A Ranking-Type Delphi Study[3]	International Journal of Information Technology and Management

Reference

Strasser, A., Strahringer, S. and Westner, M. (in press): Determinants of success and failure of knowledge transfer in information systems offshoring: a ranking-type Delphi study, to be published in: Int. J. Information Technology and Management.

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[3] This article is accepted for publication (in press)

DETERMINANTS OF SUCCESS AND FAILURE OF KNOWLEDGE TRANSFER IN INFORMATION SYSTEMS OFFSHORING: A RANKING-TYPE DELPHI STUDY

ABSTRACT: The transfer of knowledge from client to service provider poses major challenges in information systems (IS) offshoring projects. Knowledge transfer directly affects IS offshoring success. Therefore, associated challenges must be overcome. Our study examines the determinants of success and failure of knowledge transfer in IS offshoring projects based on a ranking-type Delphi study. We questioned 32 experts from Germany, each with more than 10 years of experience in near- or offshore initiatives to seek a consensus among them. We identified 19 success and 20 failure determinants. These determinants are ranked in order of importance using best-worst scaling. Aspects of closer cooperation are critical for effective knowledge transfer. This includes regular collaboration, willingness to help and support, and mutual trust. In contrast, critical determinants of failure are concerned with fears and fluctuation. Hidden ambiguities or knowledge gaps, an unwillingness and disability to share knowledge, and high fluctuation negatively impact knowledge transfer.

1. INTRODUCTION

IS offshoring, the transfer of IS services to a service provider outside the service consumer's country, receives growing attention from both academics and practitioners. In academia, the off-shoring of IS services has been one of the most discussed phenomena in IS research in recent years (King & Torkzadeh, 2008), while the number of publications increased progressively (Gonzalez, Gasco, & Llopis, 2006; Strasser & Westner, 2015; Wiener, Vogel, & Amberg, 2010). In practice, IS offshoring has become an important issue for organisations (Finlay & King, 1999; King, 2008) and is an important component of business efforts; e.g., to reduce cost and to gain access to talent for delivery of IS services. In addition, it is predicted that the transfer of IS Services will continue to increase for years to come (Capgemini & Deloitte, 2015; Goetzpartners, 2013).

A major challenge of IS offshoring projects lies in the transfer of knowledge from client to service provider (Betz, Oberweis, & Stephan, 2014; Huong, Katsuhiro, & Chi, 2011; Prikladnicki & Audy, 2012). Cultural differences, language barriers, and time zone variance can cause difficulties within the knowledge transfer process, which may undermine the overall IS offshoring project success (Betz et al., 2014; Winkler, Dibbern, & Heinzl, 2006). Numerous studies confirm that the transfer of knowledge directly affects IS offshoring success (e.g., Beulen, Tiwari, & van Heck, 2011; Sudhakar, 2013), while an unsuccessful transfer of knowledge constitutes a major reason for IS offshoring failure (Carmel & Tjia, 2005; Chen, McQueen, & Sun, 2013).

Although there is a sharp increase of research in relation to knowledge transfer and management aspects in IS research, only a few studies focus on determinants that influence knowledge transfer (Strasser & Westner, 2015; Wiener et al., 2010). These studies conduct mainly interpretive research using case studies indicating that this field of research is still at an early stage. In addition, these studies focus on the identification of influencing factors, while the analysis of these factors is lacking.

Hence, quantitative research that analyses critical determinants influencing knowledge transfer, and thus the success of the offshoring initiative, is required. In order to quantitatively analyse determinants of success and failure, Remus and Wiener (2010) recommend ranking them. Therefore, we pose the following research questions:

> *RQ1:* What are the determinants that influence, either positively or negatively, knowledge transfer between client and vendor companies in IS offshoring?

> *RQ2:* What is the importance of these determinants?

The answers to these research questions are relevant to research and management practice. For research, our paper addresses the research deficit regarding the aspect of "how to offshore." It adds to existing research with the aim to identify and prioritise the influencing determinants. Hence, our study contributes to a deeper understanding concerning success and failure determinants that are crucial for knowledge transfer and the overall IS offshoring initiative. For management practice, our paper offers a comprehensive set of determinants sorted by importance, which are crucial for successful knowledge transfer. The overall results help practitioners take the appropriate measures to facilitate the knowledge transfer process.

To address these questions, we apply a ranking-type Delphi study. This empirical exploratory research approach is widely used in IS research (Paré, Cameron, Poba-Nzaou, & Templier, 2013) and best suited for answering our research questions. Our ranking-type Delphi Study includes one qualitative and two quantitative rounds of questioning experts to seek a consensus among them and to rank the key determinants that influence knowledge transfer in IS offshoring initiatives.

The remainder of this paper is structured as follows: Section 2 gives a brief overview of the conceptual foundation of critical knowledge transfer determinants. In subsequent Section 3, we describe the methodological background of our study, including the process steps to reach consensus and to rank the influencing determinants. Thereafter, we present our findings in Section 4, containing 19 ranked determinants of success and 20 ranked determinants of failure in knowledge transfer. In Section 5 we summarise our key findings and provide avenues for future research.

2. CONCEPTUAL BACKGROUND

We define knowledge as a mix of experience, values, contextual information, and expert insight, allowing the evaluation and incorporation of new experiences and information (Davenport & Prusak, 1998). Knowledge transfer is a "process through which one unit (e.g., group, department, or division) is affected by the experience of another" (Argote & Ingram, 2000, p. 151). This process includes all activities required to transfer knowledge from the source to the recipient. Given our focus on knowledge transfer in an IS offshoring context, we hereinafter consider the transfer of knowledge from onshore to offshore organisations.

Few studies focus on determinants that positively influence knowledge transfer in IS offshoring initiatives. These determinants can be divided into key conditions for sharing knowledge as well as techniques used to facilitate the knowledge transfer process. The key constructs clustered by their focus are illustrated in Table 1. 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	Determinants	Reference	Evidence
Key conditions	Good impressions of each other	Huong et al., 2011	Qual
	Readiness to take over responsibility	Smite & Wohlin, 2011	Qual
	Support from the knowledge source	Deng & Mao, 2012	Quan
	Willingness to participate and cooperate	Deng & Mao, 2012; Huong et al., 2011	Qual and Quan
Techniques used	Codified knowledge through formal training	Williams, 2011	Quan
	Gain tacit knowledge by incorporation within the client		
	Right balance between formal and informal techniques	Gregory, Beck, & Prifling, 2009	Qual
	Stimulating motivation to share knowledge		
	Sufficient planning and careful implementation	Smite & Wohlin, 2011	Qual
	Using an active learning mechanism	Deng & Mao, 2012	Quan

Table 1: Determinants that positively influence knowledge transfer

Few key conditions must be fulfilled before knowledge transfer can occur effectively. First, good impressions and a willingness to participate and cooperate facilitate the knowledge transfer process between Japanese and Vietnamese software companies (Huong et al., 2011). Good impressions are derived from national and cultural similarities and a motivation to share knowledge and experience. In addition, knowledge transfer can be difficult in offshoring initiatives because not all participants are willing to share their knowledge with others. Hence, willingness to participate and cooperate is a critical key condition, also confirmed by Deng and Mao (2012). Another key condition identified by Deng and Mao (2012) is support from the knowledge source. This client support can manifest itself in several forms, such as providing technical materials, project management tools, training and visiting opportunities, technical support, and personnel exchange. Finally, transfer readiness must be evaluated. The receiving site's readiness to take over the responsibility is another key condition for effective knowledge transfer (Smite & Wohlin, 2011).

However, the use of techniques has a positive influence on knowledge transfer. According to Williams (2011), the offshore vendor's understanding of the client is positively influenced by exposure to codified knowledge through formal training on the client's business and on the current system or project, and by exposure to tacit knowledge through embedment within the client. Client embedment refers to the extent to which the offshore vendor is tightly incorporated within the client organisation. 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 for knowledge transfer (Gregory et al., 2009). Once a positive attitude towards knowledge sharing and collaboration is presented, formal and informal techniques leads to the greatest outcomes. Furthermore, rushed and ad-hoc execution should be avoided. Knowledge transfers require sufficient planning and careful implementation to facilitate knowledge transfer processes in a positive way (Smite & Wohlin, 2011). Finally, Deng and Mao (2012) show the importance of an active learning mechanism, knowledge articulation, in learning from the client and learning about the client. It is important to stimulate knowledge transfer (Deng & Mao, 2012).

In contrast, there are determinants that negatively influence knowledge transfer. These determinants can be distinguished between aspects related to capabilities, cooperation and strategy, culture and mentality, external influences, and management (cf. Table 2).

Focus	Determinants	Reference	Evidence
Capabilities	Lack of communication and cooperation competency	Wende, Schwabe, Philip, & King, 2013	Qual
	Little background or business knowledge on the provider side		
Cooperation and strategy	Communication barriers	Huong et al., 2011	Qual
	Lack of equivalence in individual competence		
	Difficulties in knowledge cooperation	Betz et al., 2014	Qual
	Difficulty maintaining informal networks		
	Latency time using IT and media		
	Missing backflow of knowledge		
	Unwillingness and disability to share knowledge		
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		
	Cultural differences	Huong et al., 2011	Qual
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 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 2: Determinants that negatively influence knowledge transfer

Frequent exchanges take place between the on- and the offshore team during the knowledge transfer process. The processes of communication and cooperation depend on the individual competencies of team members. Negative effects on the transfer of knowledge arise from non-qualified personnel with a 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 com-

petencies (Huong et al., 2011). Communication barriers become apparent when two partners come from different countries without a common language. In addition, Huong et al. (2011) identified a lack of equivalence according to IT skills, working capacity, and project management experience between Japanese clients and Vietnamese vendors that negatively impact knowledge transfer.

Additional difficulties arise, inter alia, from an unwillingness and disability to share knowledge and missing backflow of knowledge (Betz et al., 2014). The unwillingness to share knowledge occurs if team members capture and guard knowledge to gain an advantage over other team members. In some cases, knowledge is not transferred back to the onsite team. Consequently, the knowledge transfer process is prohibited while an undesired dependency on the offshore provider arises.

Beyond this, cultural differences negatively affect the sharing of knowledge (Huong et al., 2011). This includes attitudes and behaviour, i.e., challenges to address knowledge gaps in the midst of a project and to ask questions that would unveil a lack of technical knowledge, as well as following instructions and not showing individual initiative or contributing personal experience to achieve positive results (Wende et al., 2013).

Further determinants are related to external influences and management aspects. Strong data protection laws in Western countries may cause problems and impact, e.g., joint tests of software and systems (Betz et al., 2014). Management-related aspects that negatively influence knowledge transfer are hidden (extra) costs and a lack of transparency regarding what knowledge is available and where (Betz et al., 2014). Betz et al. (2014) found that there is an awareness of the presence of hidden costs arising from, e.g., language problems and intercultural barriers, but a lack of transparency when it comes to identifying them. An additional problem to the missing transparency is that while some knowledge is in fact available, it is not always explicitly recognisable. A further determinant is the lack of common rules between the on- and the offshore team (Huong et al., 2011). There are spoken and unspoken rules that must be synchronised between both parties. Finally, the usage of an usual media mix without any adaption to the project context by the client negatively influences the knowledge transfer (Wende et al., 2013). Hence, the selection and availability of media is an important consideration in order to not undermine knowledge transfer processes.

3. METHODOLOGY

3.1 Delphi method

This empirical exploratory study uses the Delphi method to collect data on IT experts' perceptions of the determinants of success and failure of knowledge transfer in IS offshoring initiatives. The objective of the Delphi method is to obtain the most reliable consensus of a group of experts. It attempts to achieve this by a series of questionnaires interspersed with controlled opinion feedback. After each iteration, a controlled feedback with the anonymised consolidated responses is provided to all participants. As a consequence, experts can reflect and revise their opinions and judgements after each iteration (Delbecq, van de Ven, & Gustafson, 1975; Linstone & Turoff, 1975). Delphi was first described in 1963 by Dalkey and Helmer as a systematic forecasting method to identify future technological and economic trends. Over the years, different Delphi method variants have been applied in a large number of research areas, e.g., business, education, healthcare, and IS. In IS research, Delphi studies have been conducted for almost three decades and have been published in a large variety of outlets, including top-ranked IS journals (Gray & Hovav, 2008; Paré et al., 2013; Rowe & Wright, 1999; Skulmoski, Hartman, & Krahn, 2007; von der Gracht, 2012). The ranking-type Delphi represents the most commonly used by far Delphi variant in the IS field (Okoli & Pawlowski, 2004; Schmidt, 1997) and its application grew significantly in the second half (2006 to 2010) of the decade (Paré et al., 2013).

The main steps of the Delphi method are depicted in **Figure**. The first step comprises the design of the Delphi study to clearly define the field of research. After that, the expert selection and questionnaire administration processes can be conducted simultaneously. Both processes consist of three process steps to create a list of experts to develop the questionnaire. After the completion of both processes, the first qualitative, and subsequently the second and third quantitative questionnaires, of Delphi can be started. The intention of the first questionnaire is to elicit as many determinants of success and failure as possible from all the experts and to verify the state of research. The second and third questionnaires pursue the objective to explore agreement with the determinants elicited in the first questionnaire and to rank these determinants. The following subsections 3.2 to 3.6 describe the respective numbered process steps in detail.
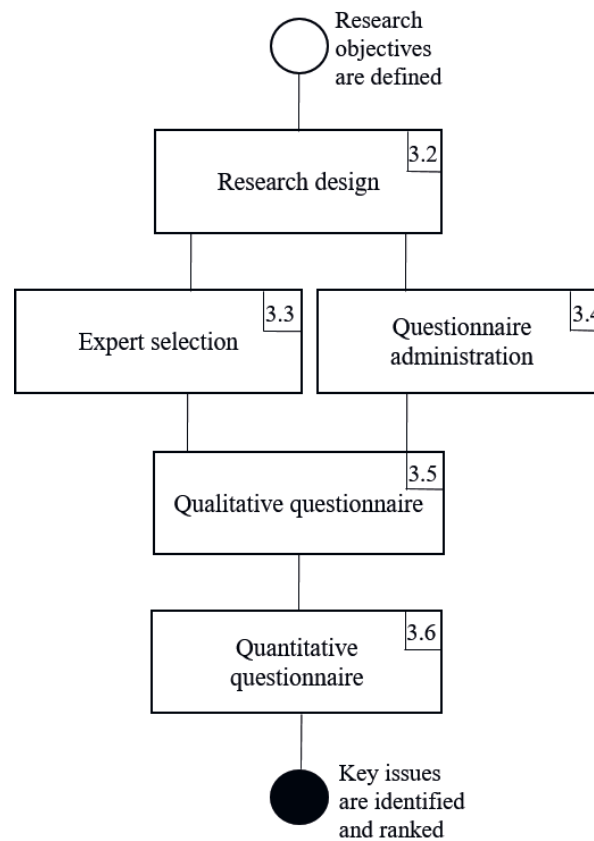
Figure 1: Process steps of Delphi method to reach consensus and to rank key issues (adapted from Delbecq et al., 1975; Ekionea & Fillion, 2011; Schmidt, 1997)

3.2 Research design

First, the design of the Delphi study needs to be specified. Different foci and objectives clearly differentiate Delphi method variants from each other (Strasser 2016). We use a ranking-type Delphi method (Delbecq et al., 1975; Schmidt, 1997) for our study design. The focus and objective of the ranking-type Delphi is to seek a consensus of the relative importance of a set of issues. The characteristics of ranking-type Delphi and other different Delphi method variants are shown in Table 3. The grey marked squares illustrate our selected research approach.

Attributes	Specifications						
Focus and objective	Arguments: Develop relevant arguments and expose reasons (*Argument Delphi*)	Decisions: Prepare and support decisions (*Decision Delphi*)	Facts: Elicit opinion and gain consensus (*Classical Delphi*)	Ideas: Define and differentiate views (*Policy Delphi*)	Opinions: Opinion capture in multi-disciplinary tasks (*EFTE Delphi*)	Rankings: Consensus about the relative importance of a set of issues (*Ranking-Type Delphi*)	Scenarios: Construct holistic scenarios (*Disaggregative Policy Delphi*)
Panel participant	Expert in narrow sense				Expert in broad sense		
Participating group	Restricted anonymity				Total anonymity		
Round 1 design	Qualitative				Quantitative		
Specific characteristics of panel	Size of panel should be high in absolute terms	Consider different groups of experts		Cover a high percentage of a specific group of experts	Should include a group of experts with no strong personality conflicts		Size of panel should not be too large
Issues developed from	Experience of participants		Literature review			Pilot study	
Processing of the results	IT-supported				IT-supported in real-time		

Table 3: Characteristics of the selected Delphi method variant (Strasser, 2016, p. 8)

Regarding the panel participants involved, a differentiation between an expert in a narrow sense and in a broad sense can be observed. An expert in a narrow sense is an individual at the top of their field of knowledge derived from training or experience. In contrast, an expert in a broad sense does not necessarily have a wide range of knowledge in their own fields; their expert status results from their actual position in the decision-making hierarchy or their affiliation with an interest group. Our panel consisted of a group of experts with proven expertise in IS projects transferring knowledge to near- or offshore locations (cf. Appendix on page XX). Hence, our panelists were experts in a narrow sense.

The participating group can be partially anonymous, i.e., the participants know each other's names or directly exchange feedback, while their responses remain anonymous, or totally anonymous, i.e., panelists, as well as their responses, remain anonymous. In the series of questionnaires for the study at hand, responses were only sent to researchers who anonymised all replies. This total anonymity allowed group participants to express their judgements individually, without any influence from other panel participants.

The first round was qualitative, which included open questions. This design offers freedom for experts to verify the determinants of success and failure from existing research and to provide their own determinants that positively or negatively influence knowledge transfer.

The panel size was high in absolute terms for representation of a high number of expert views. Although there is no consensus in literature on the optimal number of subjects for a Delphi study

in general or a ranking-type Delphi in detail (Paré et al., 2013; Skinner, Chin, Nelson, & Land, 2015), we followed the recommendation of Delbecq et al. (1975) and aimed to reach a panel size of approximately 30 participants.

The questions were developed through an exhaustive literature review (Strasser & Westner, 2015), complemented by the experience of the participants from the first round. For questionnaire and result processing we used the survey tool "LimeSurvey".

3.3 Expert selection process

Our expert selection process consisted of three steps: (1) elaboration of the expert selection criteria, (2) searching for experts that fulfil these criteria and aggregate the findings into a list of potential experts, and (3) contacting the selected experts to invite them to participate in our study.

(1) Experts suitable for the study are managers or practitioners with IS off- or nearshoring experience. They should be directly involved in IS off- or nearshoring initiatives incorporating the transfer of knowledge from Germany to near- or offshore countries.

(2) To identify these experts, we relied on the largest German business social network, XING. We contacted all people registered at XING who had an affiliation with near- or offshoring in Germany. For this purpose, we used the search string "offshor* OR nearshor* OR off-shor* OR near-shor*'' in XING's ''I offer'' to identify experts with the appropriate affiliation. In addition, we limited the search to ''Germany'' in the ''region'' search field.

(3) As a result, 700 experts with potentially relevant expertise were aggregated in a list and contacted via XING. The first contact contained an explanation of our study, asking whether there was an interest to participate. Overall, 369 experts expressed their interest and were suitable to participate. These experts were invited by e-mail and received a link to a web page hosting the questionnaire.

3.4 Questionnaire administration process

In parallel to the expert selection process, questionnaire administration was conducted. This process consisted of three steps: (1) selecting the survey instrument, (2) administering the questions for each iteration, and (3) pre-testing and validating the design.

(1) We decided to use a web-based questionnaire tool for data gathering. We compared different tools according to their features and selected LimeSurvey[4] because it was most appropriate for our research design.

(2) Data gathering was undertaken in three rounds. Each iteration was intended to undertake a different step in the process of consensus building, followed by Delbecq et al. (1975), Schmidt (1997) and Strasser (2018): brainstorming, narrowing down, and ranking (cf. subsection 3.6).

(3) The final step of the questionnaire administration process included the design of a pre-test. Five participants pretested each subsequent questionnaire and gave feedback. Since the Delphi method is not used to derive statistically significant results, the detection of a nonresponse-bias is not as necessary as it is for large-scale quantitative surveys (Daniel & White, 2005). Nevertheless, we compared the role and location of non-respondents to those who chose not to participate in the study. We could not determine a specific pattern of differences between the two groups. In addition, we used the cognitive method "Think Aloud" to validate the questionnaire (van Someren, Barnard, & Sandberg, 1994) and employed statistical treatment of data with the Coefficient of Variation (CV) to measure the degree of stability and consensus (Dajani, Sincoff, & Talley, 1979; von der Gracht, 2012).

3.5 Qualitative Questionnaire

The first round of the study started on September 23, 2016. Three weeks later a reminder was sent, before the survey was closed after week four. The intention of the first iteration was to elicit as many items as possible from all the experts according to the determinants of success and failure of knowledge transfer. Hence, we presented the literature findings according to determinants positively or negatively influencing the knowledge transfer (cf. Table 1, p. X and Table 2, p. X) and used open-ended questions to offer freedom for experts to express their judgements according to these findings and to contribute new determinants. We provided clear instructions and asked the participants to describe the meaning of each new item. Content analysis (Collis & Hussey, 2013) was used to group the determinants and judgements suggested by participants in the first iteration into common themes. In addition, the biographical information collected in this round included the industries in which the participants gathered their IS off- or nearshoring experience, the position(s) the participants held in IS off- or nearshoring initiatives, the years of experience the participants had with IS off- or nearshoring initiatives, and whether the participant's

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[4] URL to the first questionnaire: http://offshoring-studie.de/index.php/737619?lang=en; Version: 2.50+, Build 160616.

experience was mainly based on IS off- or nearshoring initiatives. This information is shown in the Appendix on page XX.

A randomly ordered list of the results from round 1 was sent to each participant via e-mail to consolidate the list of items. After the participants commented and validated the round 1 results, the final number of items were reported to all participants. Overall, 161 participants took part in the first round of the study, which represents a response rate of 23% in relation to the initially invited 700 experts; respectively 44% in relation to the 369 experts who expressed their interest. After the first round, we decided to focus on highly experienced experts with more than ten years of IS offshoring experience. This sample (n=53) was considered for the second round.

3.6 **Quantitative Questionnaire**

The second iteration started on November 30, 2016. A reminder for participation within 14 days was sent to non-respondents on January 02, 2017. While our set of determinants from round one consisted of around 20 items, we went on to the ranking phase (Schmidt, 1997). Hence, the second round pursued the objective to rank all determinants. As a ranking approach, we used best worst scaling (BWS), as suggested by Kobus and Westner (2016), as a ranking mechanism within Delphi studies and described in detail by Strasser (2018). BWS is based upon random utility theory and is defined as "method of data collection, and/or a theory of how participants provide top and bottom ranked items on a list" (Louviere, Flynn, & Marley, 2015). The first step in implementing a BWS survey is to choose a statistical design to construct the comparison sets (Louviere et al. 2013). For this purpose, BWS studies typically use balanced incomplete block design (BIBD). A BIBD is a set of v elements, which are allocated to b k-element subsets called blocks. As a result, each element occurs r times throughout all blocks and is paired λ times with every other element. For our study, a suitable BIBD could have consisted of 21 determinants of success and 21 determinants of failure (Louviere, Lings, Islam, Gudergan, & Flynn, 2013; Strasser, 2018). In addition, we chose five determinants per block (k). Hence, with 21 blocks in each case, each determinant will be displayed five times, assuming the design is perfectly balanced. While answering 42 question blocks in total can be tedious and time-consuming - associated with the risk that experts might not fully complete the questionnaire - we decided to follow the recommendation of Sawtooth (2013) using the following decision rule and formula: 3K/k. K is the total number of items in the study, and k is the number of items displayed per set. Based on this rule, our questionnaire finally included in each case (success and failure) 20 determinants (K) with 5 determinants in each block (k) allocated to 12 blocks. The questionnaire was created based on this data. In the next step, we asked the 53 participants to choose the best and worst determinant

from the aforementioned choice sets. After the second round, the answers given by the partici-pants were evaluated. An individual rating of the items was calculated in the first step. This was done by calculating the item-wise difference between best and worst scores for each participant. To obtain positive-only ratings that are more familiar for rating scales, a linear transformation on the means (X) is conducted. According to Allen and Yen (2001), a linear transformation can be defined as $Y = aX + b$. In this context "a" would be constant, "X" would be the mean, and "b" is the number of repetitions of an item in the BIBD plus one. The resulting formula is $\bar{X} = X + r + 1$.

The rating scores of each individual were then used to calculate the mean scores and the standard deviation (SD). Overall, 40 participants answered the second round of the study, which repre-sents a response rate of 75%. As preparation for the third round, we sorted the determinants in each question block according to the group response displayed in descending order of the $\bar{X}$ val-ue. In addition, we pre-filled each question block with the answer of each participant to enable comparison. Based upon the systematic comparison of the group answer in each question block versus their own response from the second round, these 40 participants were asked again. The participants had to consider if they wanted to revise their response based on the views of the oth-er experts in round three and to give reasons for this revision. The intention of the third round was to gain stability and consensus (Dajani et al., 1979; von der Gracht, 2012) and to rank all items. 32 participants answered the third round of the study, which represents a response rate of 75%. While stable answers between the second and the third round were reached, we stopped the Delphi survey at this point and developed a final ranking list.

4 RESULTS

The ranked determinants that positively influence knowledge transfer are presented in Table 4. It is obvious that the CV values of 15 determinants decrease or remain the same, while the remaining increase slightly. The individual CV difference (CV Diff) is constantly smaller than 0.1, while the absolute CV difference is ca. 0.01. Hence, stability is clearly reached and there is no need for an additional round. The consistent decrease of the CV between the second and the third round further indicates an increase in consensus (greater movement toward the mean). According to English and Kernan (1976), a CV of ≤ 0.5 indicates a good degree of consensus. Thus, the individual CV of round three clearly indicates that consensus is reached for 19 of the 20 determinants; solely, the determinant ranked on place 20 reached a CV between >0.5 and ≤0.8, which indicates a less than satisfactory degree of consensus (English & Kernan, 1976). Thus, the last determinant was not considered.

Rank	Determinants	$\bar{X}$	X	SD	CV R2	CV R3	CV Diff
1	Collaborating regularly to clarify questions, solving problems together, and exchanging information on current topics.	5,34	1,34	1,05	0,19	0,20	-0,01
2	Willingness to help and support the offshore team and share own knowledge and experiences*.	5,16	1,16	0,91	0,19	0,18	0,01
3	Mutual trust, e.g., that mutual commitments are adhered to.	5,13	1,13	1,49	0,31	0,29	0,02
4	Working together on real problems and challenges and solving them in a joint approach, creating common experience.	4,88	0,88	0,99	0,24	0,20	0,04
5	Treating people fairly and respecting other cultures, behaviours, and feelings.	4,81	0,81	1,24	0,28	0,26	0,02
6	Transparency regarding vision, mission, goals, actual status, and priorities.	4,75	0,75	1,71	0,37	0,36	0,01
7	Carrying out online and onsite trainings and workshops with the offshore team.	4,34	0,34	0,69	0,22	0,16	0,06
8	Sufficient planning and careful performing of the knowledge transfer process*.	4,22	0,22	1,05	0,26	0,25	0,01
9	Clear roles and responsibilities.	4,16	0,16	1,20	0,29	0,29	0,00
10	Performing shadowing workshops onsite (former people work, supplier is watching) for knowledge articulation.	4,09	0,09	1,01	0,24	0,25	-0,01
11	Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate*.	4,03	0,03	1,53	0,43	0,38	0,06
12	Inviting people of the offshore team to the onshore location, improving tacit knowledge exchange*.	3,94	-0,06	1,34	0,35	0,34	0,01
13	Good common intercultural understanding among all team members*.	3,88	-0,13	1,24	0,39	0,32	0,07

Rank	Determinants	$\bar{X}$	X	SD	CV R2	CV R3	CV Diff
14	Being open-minded and involving the offshore team in discussions of onsite topics.	3,84	-0,16	1,28	0,37	0,33	0,03
15	Providing all relevant information and technical material of business processes and features accessible to all team members to support knowledge transfer, e.g., via Confluence or SharePoint*.	3,59	-0,41	1,27	0,41	0,35	0,06
16	Using deeply integrated collaboration tools and common ticket systems.	3,03	-0,97	1,05	0,36	0,34	0,02
17	Establishing a detailed project control, progressing the knowledge transfer process, and reporting to the next higher management level.	3,00	-1,00	1,39	0,50	0,46	0,03
18	Receiving site's readiness to take over the responsibility*.	2,97	-1,03	1,07	0,35	0,36	-0,02
19	Using an accepted and understood development methodology.	2,44	-1,56	1,20	0,43	0,49	-0,06
20	Comparable process maturity.	2,41	-1,59	1,62	0,58	0,67	-0,09

Table 4: Ranking of the determinants that positively influence knowledge transfer. Determinants with an asterisk (*) originate from literature

The participants confirmed seven out of ten determinants from literature in the first round. "Confirmed" means that these determinants (with an asterisk (*) in Table 4) were named by more than 50% of the 53 experts in round one and thus considered for round two and round three. Based on comments from the expert group, the designation of some tasks has been modified. Table 6 in the Appendix on p. XX shows round one's results regarding the determinants that positively influence knowledge transfer from literature.

The ranking results from the achieved $\bar{X}$ value. The first three determinants reach an $\bar{X}$ value of >5 focusing on aspects of closer cooperation. In accordance to the first determinant one participant added: "Regular collaboration is the key. This includes honest communication, i.e., that one can ask questions and is able to communicate when something is not understood or went wrong". Closer cooperation further requires trust and a willingness to help and support the offshore team and to share their knowledge. The importance of the latter determinant confirms previous research findings of Deng and Mao (2012) and Huong et al. (2011). In addition, one of the participants highlighted: "Mitigate information hiding, especially from onsite delivery. The willingness from all team members to participate and cooperate is crucial for the success of knowledge transfer."

The determinants on ranking positions four to 17 reach an $\bar{X}$ value of ≤5 up to >3. One implies working together on real problems and challenges (ranking position four). "Only theory or train-

ing does not work. Real problems have to be solved collectively" (one participant of the study). In addition to this, online and onsite trainings and shadowing workshops with the offshore team occupy rank seven and rank ten. Hence, working together on problems from daily operations is critical, but needs to be supplemented by carrying out trainings or workshops. The latter are ranked in the top ten and used with positive effects: "We do a lot of training with the nearshore guys, both in Kiev and here in Berlin. This helps with the process and with the knowledge transfer, and gets the guys to know each other face to face." Finally, it can be noted that this ranking position encompasses five determinants that originated from previous research findings. This confirms their relevance and simultaneously illustrates their importance in contrast to other determinants.

The last three determinants, 17 to 19, reach an $\overline{X}$ value of ≤ 3. These determinants focus on project control, responsibility, and the usage of an accepted and understood development methodology. Establishing a detailed project control to progress the knowledge transfer process and to report to the next higher management level reaches the 17th ranking position. Two participants added: "Transparent and tight control supports performance reflection for all participants", while "The true performance is measured by key performance indicators, [i.e.] responsiveness and right understanding of prioritisation of tasks". Smite and Wohlin (2011) found that the receiving site's readiness to take over the responsibility is a key condition for effective knowledge transfer. While this determinant was considered important in round 1, it is – compared to the other determinants – of minor importance after round 3, achieving an 18th position on the ranking list. The usage of an accepted and understood development methodology reached the last (19th) ranking position. We did not consider the determinant on the last (20th) position, process maturity, because it did not reach a good degree of consensus.

The ranked determinants that negatively influence knowledge transfer are presented in Table 5. It is obvious that the CV values of 16 determinants decrease or remain the same, while the rest increase slightly up to 0.03. The individual CV difference is constantly smaller or equal to 0.1, while the absolute CV difference is ca. 0.02. Hence, stability is clearly reached and there is no need for an additional round. The consistent decrease of the CV between the second and the third round indicates an increase in consensus. The CV values of round three show a good degree of consensus in accordance with English and Kernan (1976). Hence, consensus is reached for all 20 determinants.

Rank	Determinants	$\bar{X}$	X	SD	CV R2	CV R3	CV Diff
1	Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge.*	6,19	2,19	0,92	0,15	0,15	0,00
2	Unwillingness and disability of the onsite team to share knowledge due to, e.g., anxiousness about losing work or fear of change*.	5,69	1,69	1,33	0,25	0,23	0,01
3	High fluctuation at offshore site.	5,44	1,44	1,27	0,26	0,23	0,03
4	Insufficient language skills onsite and offshore.*	4,75	0,75	1,20	0,27	0,25	0,02
5	Conflicting operation models and lack of willingness to change existing processes.	4,69	0,69	1,40	0,30	0,30	0,00
6	Limited initiative or use of experience to achieve positive results and only following instructions*.	4,66	0,66	1,08	0,24	0,23	0,00
7	Inadequate documentation with inconsistent terminological definitions that are not centrally accessible.	4,19	0,19	1,33	0,30	0,32	-0,01
8	Lack of cultural understanding leads to cultural differences in knowledge transfer process*.	4,03	0,03	1,29	0,34	0,32	0,03
9	Laws and regulations that do not allow the transfer of processes or data into other countries*.	4,00	0,00	1,35	0,42	0,34	0,08
10	High ratio of remote knowledge transfer, sparsely joint onsite work at the same location.	3,88	-0,13	0,96	0,26	0,25	0,01
11	Limited background knowledge relevant to the project on the provider side*.	3,84	-0,16	0,94	0,29	0,24	0,05
12	Low technical capabilities in the offshore team.	3,72	-0,28	1,23	0,33	0,33	0,00
13	Absence of a common knowledge base.	3,69	-0,31	0,92	0,29	0,25	0,04
14	Lack of soft skill competencies in the offshore team*.	3,66	-0,34	1,02	0,33	0,28	0,05
15	Lack of transparency regarding what knowledge is available and where*.	3,63	-0,38	0,82	0,25	0,23	0,02
16	Lack of common rules*.	3,44	-0,56	0,93	0,27	0,27	0,00
17	Lack of informal network relationships to share knowledge*.	3,13	-0,88	0,82	0,36	0,26	0,10
18	Missing technical equipment or lack of tools for knowledge transfer.	2,59	-1,41	1,14	0,41	0,44	-0,03
19	Contractual limitations on time.	2,47	-1,53	1,03	0,40	0,42	-0,02
20	Latency time using IT and media, e.g., in video conferences*.	2,34	-1,66	1,19	0,50	0,50	0,00

Table 5: Ranking of the determinants negatively influencing knowledge transfer. Determinants with an asterisk (*) originate from literature

The participants confirmed twelve out of 17 determinants from literature in the first round. "Confirmed" means that these determinants (with an asterisk (*) in Tabel 5) were named by more than 50% of the 53 experts in round one and thus considered for round two and round three. Based on comments from the expert group, the designation of some tasks has been modified. Table 6 in the Appendix on p. XX shows round one's results regarding the determinants that negatively influence knowledge transfer from literature.

As previously mentioned, the ranking results from the $\bar{X}$ value. The first three determinants reach an $\bar{X}$ value of >5 concerning fears and fluctuation. One participant explained: "The offshore team is not able to address knowledge gaps and ask questions. We can only guess whether they really understand the information. A lack of technical knowledge would never be openly admitted". This finding confirms previous research (Wende et al., 2013) and thereby underlines the importance of these determinants according to their negative influence on knowledge transfer. In addition, "Knowledge transfer needs to be repeated endlessly due to fluctuation at the offshore site". Conversely, there are also fears for the onsite team, such as anxiousness over losing work or other changes. Consequently, an unwillingness and disability to share knowledge with the offshore team arises and negatively affects the knowledge transfer. One participant of the study stated: "Nobody will help to eliminate their own job. Change is always outside the comfort zone." This finding confirms Betz et al. (2014) and underlines the importance of this determinant.

The determinants on ranking positions four to 17 reach $\bar{X}$ values of ≤5 up to >3. It is apparent that knowledge transfer is negatively influenced due to a lack of different skills and competencies, primarily at the offshore site. This includes insufficient language skills (ranking position four), limited background knowledge relevant to the project (ranking position six), lack of soft skills (ranking position 14), and low technical capabilities (ranking position 12). The first three confirm previous studies by Betz et al. (2014), Huong et al. (2011), and Wende et al. (2013), while the last determinant supplements them. One participant makes a comparison: "I find that the skill level compared to our own test managers is very theoretical with limited experience. Most solutions come from the internet and not [result] from experiences." Another indicates the level of difficulty: "Simple jobs are fine, but complicated [tasks] need massive support from the onsite team and this isn't possible every time." Furthermore, two determinants relate to the usage of explicit knowledge. Inadequate documentation with inconsistent terminological definitions (ranking position seven), as well as the absence of a common knowledge base (ranking position 13), negatively influence the knowledge transfer. A participant of the study explained: "Legacy systems or systems that were used for a long time often don't have proper documentation.

Knowledge is kept within heads." Finally, it can be noted that this ranking position encompassed nine determinants that originated from previous research findings. This confirms their relevance and simultaneously illustrates their importance in contrast to other determinants.

The last three determinants reach $\overline{X}$ values of ≤ 3. These determinants focus on IT (equipment) and contractual limitations. Missing technical equipment or lack of tools for knowledge transfer are placed in the last three rankings (ranking positions 18 and 20). Finally, according to one participant, contractual limitations (ranking position 19) influence knowledge transfer: "The service provider does not allocate enough time to process information after knowledge transfer sessions due to contractual limitations". Betz et al. (2014) found that the latency time using IT and media negatively impact knowledge transfer, for example, in video conferences. While this determinant was considered as important in round one, it is – compared to the other determinants – of minor importance, achieving the last place on the ranking list.

5 CONCLUSION

Knowledge transfer from client to service provider is associated with numerous challenges and is of major importance to the success of IS offshoring initiatives. We, therefore, conducted a ranking-type Delphi study and questioned 32 experts from Germany with more than ten years of experience in IS near- or offshoring initiatives. Our study included one qualitative and two quantitative rounds. In the first qualitative round, we presented the literature findings of previous research and used open-ended questions to encourage experts to express their judgements according to these findings and to contribute new determinants of success and failure. In the second and third rounds, the participants ranked the set of determinants in order of importance using a BWS approach. We found a consensus among the group of experts according to 19 determinants of success and 20 determinants of failure.

The three most important determinants of success focus on aspects of closer cooperation. This includes (1) collaborating regularly to clarify questions, solving problems together, and exchanging information on current topics; (2) a willingness to help and support the offshore team and share personal knowledge and experiences; and (3) mutual trust. We further found that working together on problems from daily operations is critical, but needs to be supplemented by carrying out training or workshops. The last three determinants of success focus on aspects related to project control, responsibility, and use methods. This includes (1) establishing a detailed project control to progress the knowledge transfer process and to report to the next higher management level; (2) receiving a site's readiness to take over the responsibility, and (3) the usage of an accepted and understood development methodology.

The three most important determinants of failure concern fears and fluctuation. This includes (1) the fact that the offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge; (2) the unwillingness and disability of the onsite team to share knowledge due to, e.g., anxiousness over losing work or fear of change; and (3) high fluctuation at an offshore site. Another finding was that the knowledge transfer is negatively influenced due to a lack of different skills and competencies, primarily at the offshore site. This includes insufficient language skills, limited background knowledge relevant to the project, lack of soft skill competencies, and low technical capabilities. In addition, the transfer of explicit knowledge is impeded while adequate documentation with consistent terminological definitions as well as a common knowledge base is lacking. The last three determinants of failure focus on IT (equipment) and contractual limitations, encompassing (1) missing technical equipment or lack of tools for knowledge transfer, (2) contractual limitations on time, and (3) latency time using IT and media, for example, in video conferences.

There are limitations to acknowledge in this study. First, the sample was exclusively from Germany. Firms in different countries have different working cultures and practices, and this limits the generalisability of our findings. Second, we focused on knowledge transfer from German clients to near- or offshore suppliers. Other knowledge transfer directions, e.g., from supplier to the client (back-sourcing) or from supplier to supplier (multi-sourcing) may include other influencing determinants.

In reference to these results, several opportunities for future research become apparent. In order to verify our results or to explain the differences, future studies could investigate other countries and knowledge transfer directions, e.g., from supplier to vendor in the context of back-sourcing or from vendor to vendor within multi-sourcing. In addition, Remus and Wiener (2008) identified that the focus of research according to critical success and failure determinants focuses on the identification of influencing determinants, while the analysis along the stages of an IS project is lacking. Hence, we recommend to further examine our findings in relation to the different phases of knowledge transfer.

APPENDICES

Appendix 1: Descriptive information regarding the Delphi study expert panel (N = 32); multiple answers were possible (Figure 2 and Figure 3)
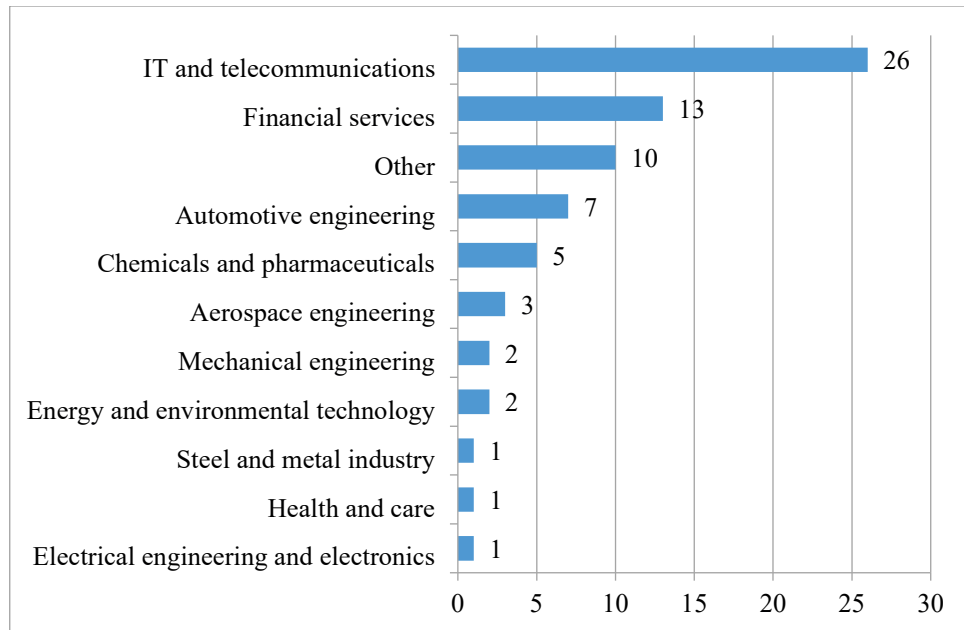
Figure 2: Industry experience
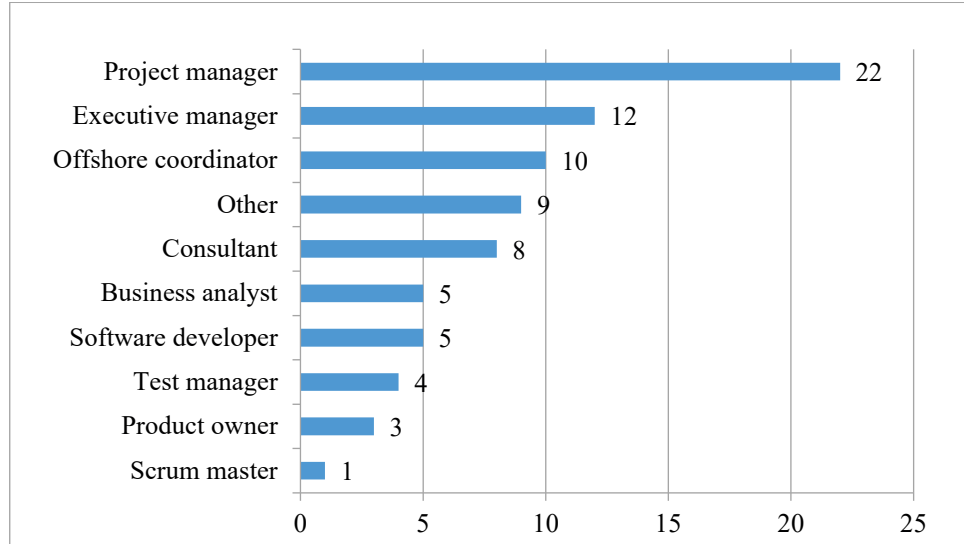
Figure 3: Positions held in IS off- and nearshoring projects
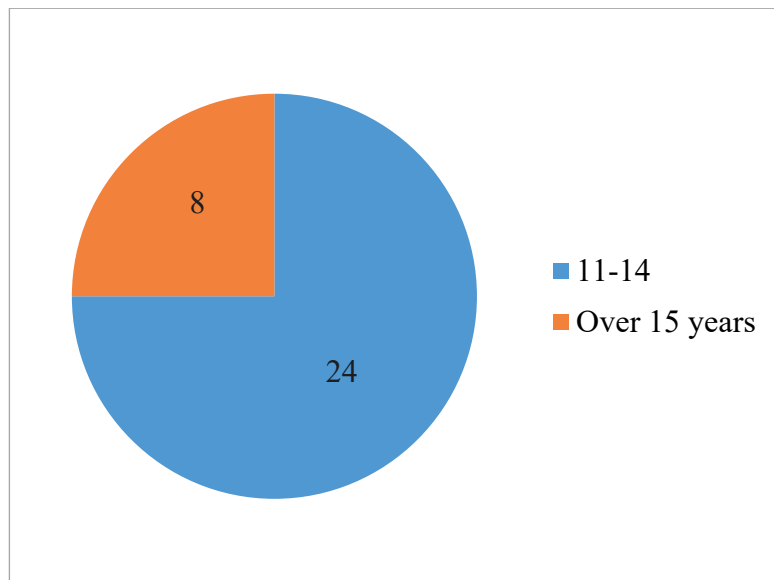
Figure 4: Years of IS off- or nearshoring experience
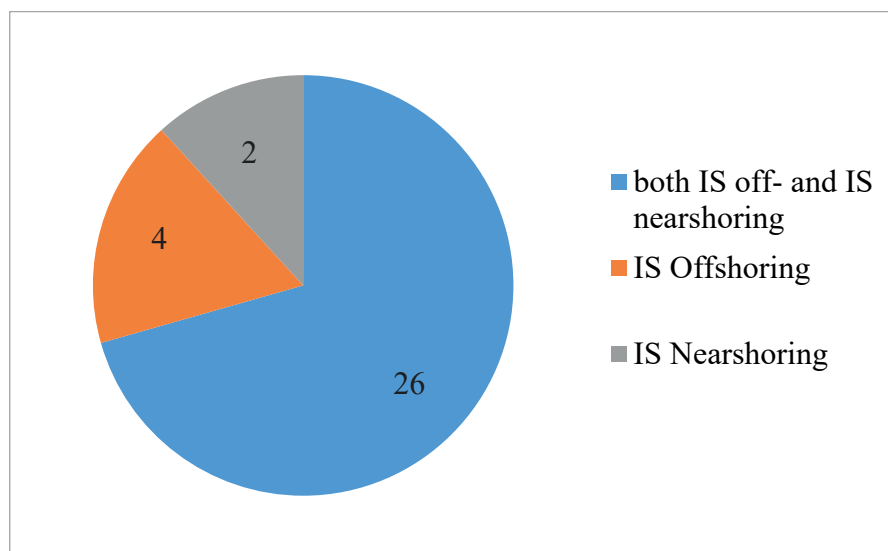
Figure 5: IS near and/or IS offshoring experience

Determinants from Literature	Designation after feedback in round 2 and round 3	Number of references	Considered for rankings
Willingness to participate and cooperate	Willingness to help and support the offshore team and share own knowledge and experiences.	38	Yes
Support from the knowledge source	Providing all relevant information and technical material of business processes and features accessible to all team members to support knowledge transfer, e.g., via Confluence or SharePoint.	37	Yes
Good impressions of each other	Good common intercultural understanding among all team members.	34	Yes
Sufficient planning and careful implementation	Sufficient planning and careful performing of the knowledge transfer process.	33	Yes
Readiness to take over responsibility	Receiving site's readiness to take over the responsibility.	32	Yes
Gain tacit knowledge by incorporation within the client	Inviting people of the offshore team to the onshore location, improving tacit knowledge exchange.	30	Yes
Stimulating motivation to share knowledge	Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate.	29	Yes
Codified knowledge through formal training	-	18	No
Right balance between formal and informal techniques	-	18	No
Use of active learning mechanism	-	18	No

Table 6: Round 1 results regarding determinants from literature positively influencing knowledge transfer. Determinants with more than 26 references (from 53; i.e., > 50% of the participants) considered for rankings in round 2 and round 3.

Determinants from Literature	Designation after feedback in round 2 and round 3	Number of references	Considered for round 2
Challenging to address knowledge gaps in the midst of the project and to ask questions that would unveil a lack of technical knowledge	Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge.	39	Yes
Lack of communication and cooperation competency	Two determinants specified: (1) Lack of soft skill competencies in the offshore team. (2) Insufficient language skills onsite and offshore	38	Yes
Cultural differences	Lack of cultural understanding leads to cultural differences in knowledge transfer process	37	Yes
Difficulty maintaining informal networks	Lack of informal network relationships to share knowledge.	34	Yes
Unwillingness and disability to share knowledge	Unwillingness and disability of the onsite team to share knowledge due to, e.g., anxiousness about losing work or fear of change.	33	Yes
Little background or business knowledge on provider side	Limited background knowledge relevant to the project on the provider side.	32	Yes
Communication barriers	Specified to two determinants: (1) Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge. (2) Insufficient language skills onsite and offshore.	32	Yes
Strong data protection laws in western countries	Laws and regulations that do not allow the transfer of processes or data into other countries.	31	Yes
Only following instructions and not using their initiative or experience to achieve positive results	Limited initiative or use of experience to achieve positive results and only following instructions.	29	Yes
Lack of transparency regarding what knowledge is available and where	Lack of transparency regarding what knowledge is available and where.	28	Yes
Latency time using IT and media	Latency time using IT and media, e.g., in video conferences.	27	Yes
Lack of common rules	Lack of common rules.	27	Yes
Missing backflow of knowledge	-	20	No
Lack of equivalence in individual competence	-	17	No
Difficulties in knowledge cooperation	-	15	No
Hidden (extra) costs	-	14	No

Determinants from Literature	Designation after feedback in round 2 and round 3	Number of references	Considered for round 2
Using usual media mix without any adaptation to the project context by the client	-	11	No

Table 7: Round 1 results regarding determinants from literature negatively influencing knowledge transfer.

Determinants with more than 26 references (from 53; i.e., > 50% of the participants) considered for rankings in round 2 and round 3.

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Unpublished appendix / appendices

Questionnaire on the determinants of success and failure: Round 1

Knowledge Transfer in Information Systems (IS) Offshoring

TECHNISCHE UNIVERSITÄT DRESDEN

OTH OSTBAYERISCHE TECHNISCHE HOCHSCHULE REGENSBURG

The purpose of this questionnaire is to solicit your input on **knowledge transfer in information systems (IS) offshoring**, especially about the **tasks and skills of a central role in the transfer of knowledge** as well as **critical knowledge transfer factors**. We consider IS off- and IS nearshoring. For simplicity we only use the term IS offshoring. We define IS offshoring as *the transfer of IS services from Germany to a service provider outside the service consumer's home country. IS services comprise all common services, i.e., infrastructure, application development & operations, and business proces*ses.

The questionnaire consists of 3 parts with 10 questions:

1. General information about your expertise
2. Role of the Offshore Coordinator
3. Critical knowledge transfer factors in IS offshoring

Answering these 10 questions will take approximately 20 minutes. All data will be handled confidentially and will only be published in an anonymous and aggregated fashion. The protection of data privacy is fully guaranteed. Thank you for your input and your co-operation!

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[1] GENERAL INFORMATION ABOUT YOUR EXPERTISE

In which industries did you gather your IS offshoring experience? (Multiple selection possible)

- [ ] Aerospace engineering
- [ ] Automotive engineering
- [ ] Building and construction
- [ ] Chemicals and pharmaceuticals
- [ ] Electrical engineering and electronics
- [ ] Energy and environmental technology
- [ ] Financial services
- [ ] Health and care
- [ ] IT and telecommunications
- [ ] Mechanical engineering
- [ ] Precision engineering and optics
- [ ] Steel and metal industry
- [ ] Other: _____

Which position(s) do or did you hold in IS offshoring projects? (Multiple selection possible)

- [ ] Project manager
- [ ] Product owner
- [ ] Executive manager
- [ ] Software developer
- [ ] Business analyst
- [ ] Scrum master
- [ ] Test manager
- [ ] Consultant
- [ ] Offshore coordinator
- [ ] Other: _____

How many years of experience do you have with IS offshoring projects?

- ○ < 5 years
- ○ 5-7 years
- ○ 8-10 years
- ○ 11-14 years
- ○ Over 15 years

Please enter your comment here:

Is your experience mainly based on IS near- or IS offshoring projects?

- ○ IS nearshoring
- ○ IS offshoring
- ○ both IS off- and IS nearshoring

66%

[3] CRITICAL KNOWLEDGE TRANSFER FACTORS IN IS OFFSHORING

Based on IS offshoring literature, the following table summarizes the factors influencing knowledge transfer positively.

Category	Factors influencing positively
Key conditions	(1) Good impressions of each other (2) Readiness to take over responsibility (3) Support from the knowledge source (4) Willingness to participate and cooperate
Applied techniques	(5) Codified knowledge through formal training (6) Recipient's learning mechanisms (7) Right balance between formal and informal techniques (8) Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate it (9) Sufficient planning and careful performing (10) Tacit knowledge through embedment within the client

Based on your professional experience, which factors influence knowledge transfer in IS offshoring positively?

Please note: The following response fields are prefilled with the above-mentioned literature results for illustration purposes only. If you consider the above-mentioned factors relevant, please fill in the associated number(s) of the above-mentioned factors into the text field(s). You can add new factors as well. The numbers above or the order you use is not associated with any priority.

Please give a **brief explanation**

Positive	e.g., good impression of each other	derived from national, cultural similarities, or regarding economic strength
Positive	e.g., readiness to take over responsibility	depends on the receiving site's readiness to take over the responsibility
Positive	e.g., support from the knowledge source	providing technical materials, training and technical support
Positive	e.g., willingness to participate and cooperate	willingness to share knowledge
Positive	e.g., codified knowledge through formal training	is beneficial for an offshore provider's understanding of their client
Positive	e.g., using of active learning mechanisms	knowledge articulation stimulus knowledge transfer
Positive	e.g., right balance between formal and informal techniques	adequate use of both types of mechanisms in combination
Positive	e.g., stimulating motivations to share knowledge	facilitating intrinsic and extrinsic motivations
Positive	e.g., sufficient planning and careful implementation	not to push or rush transfers; planning them step by step
Positive	e.g., gain tacit knowledge by incorporation within the client	beeing incorporated into the client organization improves tacit knowledge exchange

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[3] CRITICAL KNOWLEDGE TRANSFER FACTORS IN IS OFFSHORING

Based on IS offshoring literature, the following table summarizes the factors influencing knowledge transfer negatively.

Category	Factors influencing negatively
Capabilities	(1) Lack of communication and cooperation competency
	(2) Little background or business knowledge at provider side
Cooperation and strategy	(3) Communication barriers
	(4) Difficulties in knowledge cooperation
	(5) Difficulty to maintain informal networks
	(6) Lack of equivalence in individual competence
	(7) Latency time using IT and media
	(8) Missing backflow of knowledge
	(9) Unwillingness and disability to share knowledge
Culture and mentality	(10) Challenging to address knowledge gaps in the midst of the project and to ask questions which would unveil a lack of technical knowledge
	(11) Cultural differences
	(12) Only following instructions and not using their initiative or experience to achieve positive results
External influences	(13) Strong data protection laws in western countries
Management	(14) Lack of common rules
	(15) Lack of transparency regarding to what knowledge is available and where
	(16) Hidden (extra) costs
	(17) Using usual media mix without any adaptation to the project context by the client

Based on your professional experience, which factors influence knowledge transfer in IS offshoring negatively?

Please note: _The following response fields are prefilled with the above-mentioned literature results for illustration purposes only. If you consider the above-mentioned factors relevant, please fill in the associated number(s) of the above-mentioned factors into the text field(s). You can add new factors as well. The numbers above or the order you use is not associated with any priority._

Please give a brief explanation

Negative	e.g., lack of communication and cooperation competency	insufficiently qualified personnel
Negative	e.g., little background or business knowledge	limited background knowledge relevant to the project at provider side
Negative	e.g., communication barriers	occur when two partners come from different countries without common language
Negative	e.g., difficulty to maintain informal networks	in global teams to share knowledge
Negative	e.g., latency time using IT and media	negative influence of latency time in video conferences
Negative	e.g., missing backflow of knowledge	backflow of knowledge does not take place
Negative	e.g., unwillingness and disability to share knowledge	capture and guard knowledge to gain an advantage over other team members
Negative	e.g., cultural differences	occur when the source and the recipient do not have the same cultural background
Negative	e.g., lack of transparency	what knowledge is available and where across globally distributed locations
Negative	e.g., using usual media mix	without any adaptation to the project context by the client

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Questionnaire on the determinants of success and failure: Round 2

Knowledge Transfer in Information Systems (IS) Offshoring

TECHNISCHE UNIVERSITÄT DRESDEN

OTH OSTBAYERISCHE TECHNISCHE HOCHSCHULE REGENSBURG

The purpose of the second round of the questionnaire is to solicit your input on the overall results of the first round, especially about the responsibilities and the tasks and skills of the Offshore Coordinator as well as the critical knowledge transfer factors.

The questionnaire consists of 3 parts with 7 question pages:

1. Responsibilties of the Offshore Coordinator
2. Tasks and Skills of the Offshore Coordinator
3. Critical knowledge transfer factors in IS offshoring

Answering these 7 question pages will take approximately 20 minutes. All data will be handled confidentially and will only be published in an anonymous and aggregated fashion. The protection of data privacy is fully guaranteed. Thank you for your input and your cooperation!

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4. FACTORS POSITIVELY INFLUENCING KNOWLEDGE TRANSFER

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Being open-minded and involving the offshore team in discussions on onsite topics.	○
○	Inviting people of the offshore team to the onshore location improving tacit knowledge exchange.	○
○	Mutual trust, e.g., that mutual commitments are adhered to.	○
○	Using deeply integrated collaboration tools and common ticket systems.	○
○	Transparency regarding vision, mission, goals, actual status and priorities.	○

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most impor-tant		Least impor-tant
○	Sufficient planning and careful performing of the knowledge transfer process.	○
○	Providing all relevant information and technical material of business processes and features accessible to all team members to support knowledge transfer, e.g., via Confluence or SharePoint.	○
○	Collaborating regularly to clarify questions, solving problems together and exchanging information on current topics.	○
○	Treating people fairly and respecting other cultures, behavior, and feelings.	○
○	Clear roles and responsibilities.	○

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Good common intercultural understanding among all team members.	○
○	Using an accepted and understood development methodology.	○
○	Receiving sites readiness to take over the responsibility.	○
○	Working together on real problems and challenges and solving them in a joint approach creating common experience.	○
○	Willingness to help and support the offshore team and share own knowledge and experiences.	○

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Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Comparable process maturity.	○
○	Carrying out online and onsite trainings and workshops with the offshore team.	○
○	Performing shadowing workshops onsite (former people work, supplier is watching) for knowledge articulation.	○
○	Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate it.	○
○	Establishing a detailed project controlling, progressing the knowledge transfer process and reporting to the next higher management level.	○

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Receiving sites readiness to take over the responsibility.	○
○	Sufficient planning and careful performing of the knowledge transfer process.	○
○	Performing shadowing workshops onsite (former people work, supplier is watching) for knowledge articulation.	○
○	Transparency regarding vision, mission, goals, actual status and priorities.	○
○	Providing all relevant information and technical material of business processes and features accessible to all team members to support knowledge transfer, e.g., via Confluence or SharePoint.	○

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate it.	○
○	Mutual trust, e.g., that mutual commitments are adhered to.	○
○	Carrying out online and onsite trainings and workshops with the offshore team.	○
○	Using deeply integrated collaboration tools and common ticket systems.	○
○	Using an accepted and understood development methodology.	○

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5. FACTORS POSITIVELY INFLUENCING KNOWLEDGE TRANSFER

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Establishing a detailed project controlling, progressing the knowledge transfer process and reporting to the next higher management level.	○
○	Working together on real problems and challenges and solving them in a joint approach creating common experience.	○
○	Willingness to help and support the offshore team and share own knowledge and experiences.	○
○	Being open-minded and involving the offshore team in discussions on onsite topics.	○
○	Treating people fairly and respecting other cultures, behavior, and feelings.	○

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Collaborating regularly to clarify questions, solving problems together and exchanging information on current topics.	○
○	Comparable process maturity.	○
○	Clear roles and responsibilities.	○
○	Good common intercultural understanding among all team members.	○
○	Inviting people of the offshore team to the onshore location improving tacit knowledge exchange.	○

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Receiving sites readiness to take over the responsibility.	○
○	Being open-minded and involving the offshore team in discussions on onsite topics.	○
○	Performing shadowing workshops onsite (former people work, supplier is watching) for knowledge articulation.	○
○	Treating people fairly and respecting other cultures, behavior, and feelings.	○
○	Good common intercultural understanding among all team members.	○

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Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Mutual trust, e.g., that mutual commitments are adhered to.	○
○	Using an accepted and understood development methodology.	○
○	Willingness to help and support the offshore team and share own knowledge and experiences.	○
○	Clear roles and responsibilities.	○
○	Carrying out online and onsite trainings and workshops with the offshore team.	○

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most impor-tant		Least impor-tant
○	Establishing a detailed project controlling, progressing the knowledge transfer process and reporting to the next higher management level.	○
○	Collaborating regularly to clarify questions, solving problems together and exchanging information on current topics.	○
○	Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate it.	○
○	Working together on real problems and challenges and solving them in a joint approach creating common experience.	○
○	Using deeply integrated collaboration tools and common ticket systems.	○

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most impor-tant		Least impor-tant
○	Transparency regarding vision, mission, goals, actual status and priorities.	○
○	Comparable process maturity.	○
○	Sufficient planning and careful performing of the knowledge transfer process.	○
○	Inviting people of the offshore team to the onshore location improving tacit knowledge exchange.	○
○	Providing all relevant information and technical material of business processes and features accessible to all team members to support knowledge transfer, e.g., via Confluence or SharePoint.	○

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6. FACTORS NEGATIVELY INFLUENCING KNOWLEDGE TRANSFER

Considering only these five NEGATIVELY influencing factors, which is the _most important_ and which is the _least important_?

Most impor-tant		Least impor-tant
○	Insufficient language skills onsite and offshore.	○
○	Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge.	○
○	Lack of soft skill competencies on the offshore team.	○
○	Lack of informal network relationships to share knowledge.	○
○	Contractual limitations on time.	○

Considering only these five NEGATIVELY influencing factors, which is the _most important_ and which is the _least important_?

Most important		Least important
○	Laws and regulations that are not allowing the transfer of processes or data into other countries.	○
○	Limited background knowledge relevant to the project on the provider side.	○
○	Limited initiative or use of experience to achieve positive results and only following instructions.	○
○	Low technical capabilities on the offshore team.	○
○	High ratio of remote knowledge transfer, sparsely joint onsite work at the same location.	○

Considering only these five NEGATIVELY influencing factors, which is the _most important_ and which is the _least important_?

Most important		Least important
○	Absence of a common knowledge base.	○
○	Conflicting operation models and lack of willingness to change existing processes.	○
○	Lack of transparency regarding to what knowledge is available and where.	○
○	Lack of cultural understanding leads to cultural differences in knowledge transfer process.	○
○	Inadequate documentation with inconsistent terminological definitions that is not centrally accessible.	○

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Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Latency time using IT and media, e.g., in video conferences.	○
○	Lack of common rules.	○
○	Unwillingness and disability of the onsite team to share knowledge due to, e.g., anxious to lose work or fear of change.	○
○	High fluctuation at offshore site.	○
○	Missing technical equipment or lack of tools for knowledge transfer.	○

Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Lack of transparency regarding to what knowledge is available and where.	○
○	Laws and regulations that are not allowing the transfer of processes or data into other countries.	○
○	Unwillingness and disability of the onsite team to share knowledge due to, e.g., anxious to lose work or fear of change.	○
○	Contractual limitations on time.	○
○	Limited background knowledge relevant to the project on the provider side.	○

Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
○	High fluctuation at offshore site.	○
○	Lack of soft skill competencies on the offshore team.	○
○	Lack of common rules.	○
○	Lack of informal network relationships to share knowledge.	○
○	Conflicting operation models and lack of willingness to change existing processes.	○

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7. FACTORS NEGATIVELY INFLUENCING KNOWLEDGE TRANSFER

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Missing technical equipment or lack of tools for knowledge transfer.	○
○	Lack of cultural understanding leads to cultural differences in knowledge transfer process.	○
○	Inadequate documentation with inconsistent terminological definitions that is not centrally accessible.	○
○	Insufficient language skills onsite and offshore.	○
○	Low technical capabilities on the offshore team.	○

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most impor-tant		Least impor-tant
○	Limited initiative or use of experience to achieve positive results and only following instructions.	○
○	Latency time using IT and media, e.g., in video conferences.	○
○	High ratio of remote knowledge transfer, sparsely joint onsite work at the same location.	○
○	Absence of a common knowledge base.	○
○	Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge.	○

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Lack of transparency regarding to what knowledge is available and where.	○
○	Insufficient language skills onsite and offshore.	○
○	Unwillingness and disability of the onsite team to share knowledge due to, e.g., anxious to lose work or fear of change.	○
○	Low technical capabilities on the offshore team.	○
○	Absence of a common knowledge base.	○

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Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Lack of soft skill competencies on the offshore team.	○
○	Conflicting operation models and lack of willingness to change existing processes.	○
○	Inadequate documentation with inconsistent terminological definitions that is not centrally accessible.	○
○	High ratio of remote knowledge transfer, sparsely joint onsite work at the same location.	○
○	Lack of common rules.	○

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Missing technical equipment or lack of tools for knowledge transfer.	○
○	Limited initiative or use of experience to achieve positive results and only following instructions.	○
○	High fluctuation at offshore site.	○
○	Lack of cultural understanding leads to cultural differences in knowledge transfer process.	○
○	Lack of informal network relationships to share knowledge.	○

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Contractual limitations on time.	○
○	Latency time using IT and media, e.g., in video conferences.	○
○	Laws and regulations that are not allowing the transfer of processes or data into other countries.	○
○	Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge.	○
○	Limited background knowledge relevant to the project on the provider side.	○

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Questionnaire Round 3

Knowledge Transfer in Information Systems (IS) Offshoring

TECHNISCHE UNIVERSITÄT DRESDEN

OTH OSTBAYERISCHE TECHNISCHE HOCHSCHULE REGENSBURG

The purpose of the third round of the questionnaire is to solicit your input on the overall results of the second round, especially about the responsibilities and the tasks and skills of the Offshore Coordinator as well as the critical knowledge transfer factors.

The questionnaire consists of 3 parts with 7 question pages:

1. Responsibilties of the Offshore Coordinator (page 1)
2. Tasks and Skills of the Offshore Coordinator (page 2 and page 3)
3. Critical knowledge transfer factors in IS offshoring (page 4 - page 7)

Answering these 7 question pages will take approximately 20 minutes. All data will be handled confidentially and will only be published in an anonymous and aggregated fashion. The protection of data privacy is fully guaranteed. Thank you for your input and your cooperation!

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Next

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4. FACTORS POSITIVELY INFLUENCING KNOWLEDGE TRANSFER

Please note: In each of the following questions the factors are ordered by the group response starting from the most to the least important (cf. picture). In addition, each question is prefilled with your most and least important response from the second round. Please verify your response in each question according to the group response of the other experts and make adjustments, if necessary.

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
●	Transparency regarding vision, mission, goals, actual status and priorities.	○
○	Mutual trust, e.g., that mutual commitments are adhered to.	●
○	Inviting people of the offshore team to the onshore location improving tacit knowledge exchange.	○
○	Being open-minded and involving the offshore team in discussions on onsite topics.	○
○	Using deeply integrated collaboration tools and common ticket systems.	○

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most impor- tant		Least impor- tant
○	Collaborating regularly to clarify questions, solving problems together and exchanging information on current topics.	○
○	Treating people fairly and respecting other cultures, behavior, and feelings.	●
○	Clear roles and responsibilities.	○
○	Sufficient planning and careful performing of the knowledge transfer process.	○
●	Providing all relevant information and technical material of business processes and features accessible to all team members to support knowledge transfer, e.g., via Confluence or SharePoint.	○

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Willingness to help and support the offshore team and share own knowledge and experiences.	○
●	Working together on real problems and challenges and solving them in a joint approach creating common experience.	○
○	Good common intercultural understanding among all team members.	○
○	Receiving sites readiness to take over the responsibility.	○
○	Using an accepted and understood development methodology.	●

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate it.	●
○	Carrying out online and onsite trainings and workshops with the offshore team.	○
○	Performing shadowing workshops onsite (former people work, supplier is watching) for knowledge articulation.	○
●	Establishing a detailed project controlling, progressing the knowledge transfer process and reporting to the next higher management level.	○
○	Comparable process maturity.	○

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Transparency regarding vision, mission, goals, actual status and priorities.	○
●	Sufficient planning and careful performing of the knowledge transfer process.	○
○	Providing all relevant information and technical material of business processes and features accessible to all team members to support knowledge transfer, e.g., via Confluence or SharePoint.	○
○	Performing shadowing workshops onsite (former people work, supplier is watching) for knowledge articulation.	●
○	Receiving sites readiness to take over the responsibility.	○

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Mutual trust, e.g., that mutual commitments are adhered to.	○
○	Carrying out online and onsite trainings and workshops with the offshore team.	○
●	Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate it.	○
○	Using deeply integrated collaboration tools and common ticket systems.	○
○	Using an accepted and understood development methodology.	●

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5. FACTORS POSITIVELY INFLUENCING KNOWLEDGE TRANSFER

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most impor-tant		Least impor-tant
○	Working together on real problems and challenges and solving them in a joint approach creating common experience.	○
○	Treating people fairly and respecting other cultures, behavior, and feelings.	○
○	Willingness to help and support the offshore team and share own knowledge and experiences.	○
○	Being open-minded and involving the offshore team in discussions on onsite topics.	●
●	Establishing a detailed project controlling, progressing the knowledge transfer process and reporting to the next higher management level.	○

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Collaborating regularly to clarify questions, solving problems together and exchanging information on current topics.	○
●	Clear roles and responsibilities.	○
○	Good common intercultural understanding among all team members.	○
○	Inviting people of the offshore team to the onshore location improving tacit knowledge exchange.	●
○	Comparable process maturity.	○

Considering only these five positively influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Treating people fairly and respecting other cultures, behavior, and feelings.	○
○	Performing shadowing workshops onsite (former people work, supplier is watching) for knowledge articulation.	○
○	Being open-minded and involving the offshore team in discussions on onsite topics.	○
○	Good common intercultural understanding among all team members.	●
●	Receiving sites readiness to take over the responsibility.	○

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Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Willingness to help and support the offshore team and share own knowledge and experiences.	○
○	Mutual trust, e.g., that mutual commitments are adhered to.	○
●	Clear roles and responsibilities.	○
○	Carrying out online and onsite trainings and workshops with the offshore team.	●
○	Using an accepted and understood development methodology.	○

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Collaborating regularly to clarify questions, solving problems together and exchanging information on current topics.	○
○	Working together on real problems and challenges and solving them in a joint approach creating common experience.	●
○	Using deeply integrated collaboration tools and common ticket systems.	○
○	Stimulating intrinsic and extrinsic motivations to share knowledge and collaborate it.	○
●	Establishing a detailed project controlling, progressing the knowledge transfer process and reporting to the next higher management level.	○

Considering only these five positively influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Transparency regarding vision, mission, goals, actual status and priorities.	○
●	Sufficient planning and careful performing of the knowledge transfer process.	○
○	Providing all relevant information and technical material of business processes and features accessible to all team members to support knowledge transfer, e.g., via Confluence or SharePoint.	○
○	Inviting people of the offshore team to the onshore location improving tacit knowledge exchange.	●
○	Comparable process maturity.	○

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50%

6. FACTORS NEGATIVELY INFLUENCING KNOWLEDGE TRANSFER

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
●	Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge.	○
○	Insufficient language skills onsite and offshore.	○
○	Lack of soft skill competencies on the offshore team.	○
○	Lack of informal network relationships to share knowledge.	●
○	Contractual limitations on time.	○

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Limited initiative or use of experience to achieve positive results and only following instructions.	○
○	High ratio of remote knowledge transfer, sparsely joint onsite work at the same location.	○
○	Low technical capabilities on the offshore team.	○
○	Limited background knowledge relevant to the project on the provider side.	●
●	Laws and regulations that are not allowing the transfer of processes or data into other countries.	○

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Conflicting operation models and lack of willingness to change existing processes.	○
●	Lack of transparency regarding to what knowledge is available and where.	○
○	Lack of cultural understanding leads to cultural differences in knowledge transfer process.	●
○	Inadequate documentation with inconsistent terminological definitions that is not centrally accessible.	○
○	Absence of a common knowledge base.	○

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Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
●	Unwillingness and disability of the onsite team to share knowledge due to, e.g., anxious to lose work or fear of change.	○
○	High fluctuation at offshore site.	○
○	Lack of common rules.	●
○	Missing technical equipment or lack of tools for knowledge transfer.	○
○	Latency time using IT and media, e.g., in video conferences.	○

Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Unwillingness and disability of the onsite team to share knowledge due to, e.g., anxious to lose work or fear of change.	○
○	Lack of transparency regarding to what knowledge is available and where.	○
○	Limited background knowledge relevant to the project on the provider side.	●
●	Laws and regulations that are not allowing the transfer of processes or data into other countries.	○
○	Contractual limitations on time.	○

Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
●	High fluctuation at offshore site.	○
○	Lack of soft skill competencies on the offshore team.	○
○	Conflicting operation models and lack of willingness to change existing processes.	○
○	Lack of common rules.	○
○	Lack of informal network relationships to share knowledge.	●

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7. FACTORS NEGATIVELY INFLUENCING KNOWLEDGE TRANSFER

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Insufficient language skills onsite and offshore.	○
●	Inadequate documentation with inconsistent terminological definitions that is not centrally accessible.	○
○	Lack of cultural understanding leads to cultural differences in knowledge transfer process.	○
○	Low technical capabilities on the offshore team.	●
○	Missing technical equipment or lack of tools for knowledge transfer.	○

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge.	○
○	Limited initiative or use of experience to achieve positive results and only following instructions.	○
●	Absence of a common knowledge base.	○
○	High ratio of remote knowledge transfer, sparsely joint onsite work at the same location.	○
○	Latency time using IT and media, e.g., in video conferences.	●

Considering only these five NEGATIVELY influencing factors, which is the <u>most important</u> and which is the <u>least important</u>?

Most important		Least important
○	Unwillingness and disability of the onsite team to share knowledge due to, e.g., anxious to lose work or fear of change.	○
○	Insufficient language skills onsite and offshore.	○
○	Low technical capabilities on the offshore team.	●
○	Absence of a common knowledge base.	○
●	Lack of transparency regarding to what knowledge is available and where.	○

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Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
●	Conflicting operation models and lack of willingness to change existing processes.	○
○	Inadequate documentation with inconsistent terminological definitions that is not centrally accessible.	○
○	Lack of soft skill competencies on the offshore team.	○
○	High ratio of remote knowledge transfer, sparsely joint onsite work at the same location.	○
○	Lack of common rules.	●

Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
●	High fluctuation at offshore site.	○
○	Limited initiative or use of experience to achieve positive results and only following instructions.	○
○	Lack of cultural understanding leads to cultural differences in knowledge transfer process.	○
○	Lack of informal network relationships to share knowledge.	○
○	Missing technical equipment or lack of tools for knowledge transfer.	●

Considering only these five NEGATIVELY influencing factors, which is the most important and which is the least important?

Most important		Least important
○	Offshore team does not ask questions in case of ambiguity or makes knowledge gaps transparent because it would unveil a lack of technical knowledge.	○
●	Laws and regulations that are not allowing the transfer of processes or data into other countries.	○
○	Limited background knowledge relevant to the project on the provider side.	○
○	Contractual limitations on time.	○
○	Latency time using IT and media, e.g., in video conferences.	●

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