Offshore Software Development (OSD)

A Multi-Perspective Research Framework and Agenda

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1 Introduction

Offshoring has been discussed as an organizational and a societal issue since the dawn of the Industrial Revolution (Davis et al. 2006). In that respect, offshoring is not a new phenomenon but rather a new version of Ricardo's (1821) principle of achieving greater total profit by specialization and trade. Until the end of the 20th century, offshoring was limited to manufacturing (Davis et al. 2006). Since then, companies started to increasingly apply this powerful concept to IS services.

One aspect of IS offshoring is the relocation of software services (e.g., Carmel and Tija 2005; Heeks et al. 2001; Krishna et al. 2004; Sahay et al. 2003; Willcocks and Lacity 2006), the so called OSD. This specific form of IS offshoring is relatively new (Delmonte and McCarthy 2003) and was particularly driven by the Y2K problem (Amoribieta et al. 2001) as well as the conversion of software systems to the euro (Mani and Rajkumar 2001). In addition, significant advances in telecommunications technologies enabled companies in low-wage countries to provide the requested development services (Mani and Rajkumar 2001).

Currently, the high demand for e-business and web-based software (Adelakun and Jennex 2003; Mani and Rajkumar 2001) as well as the maintenance and redevelopment of legacy systems (Schaaf 2004) are continuing the drive for OSD. In 2001, almost two out of five Fortune 500 companies offshored software development services to India (Amoribieta et al. 2001). Furthermore, the implementation of OSD projects ranks high in many organizations' to-do-lists for the next years (Jacobson and Lidman 2004). This can be reasoned by the fact that software services are particularly suitable for offshoring due to their labor intensity and modularity (Rack 2001). Consequently, a growing proportion of the global offshore market is in the software development area (Delmonte and McCarthy 2003).

Despite its high relevance, current research on OSD lacks a consolidated view on existing research results (Mertens et al. 2005; Wiener 2006). Prior research reviews either considered IS outsourcing (e.g., Dibbern et al. 2004) and IS offshoring

in general (e.g., King and Torkzadeh 2008; Westner and Strahringer 2007), or examined possible implications of OSD for different stakeholder groups (Niederman et al. 2006). However, none of these reviews provides an in-depth analysis of current OSD research from an organizational perspective. The paper at hand aims to fill this gap by systematically reviewing and analyzing prior academic literature on OSD. In the style of Westner and Strahringer (2007), it applies an IS managerial point of view. Further, by basically following the methodological approach employed by Dibbern et al. (2004) in their literature survey and analysis of (national) IS outsourcing, it ensures research continuity and comparability.

The paper's main objectives are to develop a coherent OSD research framework, to identify relevant research contributions, to organize these contributions along the framework perspectives, as well as to derive implications and directions for future research in the field of OSD. According to Dibbern et al. (2004), literature reviews are typically concerned with examining the progress in a specific research field. However, due to the relative newness of OSD, this paper rather aims at giving a first in-depth overview of research activities in this field.

The paper is structured as follows: the next section positions OSD in the research context. We then introduce our multi-perspective research framework, describe our literature review procedure, present our findings, and conclude by discussing the paper's implications.

2 Research Background

2.1 Definitions

IS offshoring can be regarded as an extension and a modification of IS outsourcing (Davis et al. 2006). An extension because IS offshoring projects can be performed by both third party vendors (*offshore outsourcing*) and subsidiaries, joint ventures or strategic alliances (*captive offshoring*). A modification because offshored IS services are rendered by a supplier organization located outside the borders of the client country (Adelakun and Jennex 2003; Haried and Nazareth 2005).

Regarding the type of IS services relocated in an IS offshoring initiative, it can generally be distinguished among an application, an infrastructure, and a process level (Allweyer et al. 2004). OSD refers to the application level and thus represents a specific form of IS offshoring. Mani and Rajkumar (2001, p. 63) broadly define OSD as follows: "Offshore development of software occurs when the supplier is from a different country than the company outsourcing its development."

In this paper, we follow both Davis et al.'s (2006) general IS offshoring definition and Mani and Rajkumar's (2001) OSD definition. Hence, offshore outsourcing and captive offshoring are considered as options for the performance of an OSD project. In line with the definitions above, the terms near- and farshoring are subsumed under the term OSD in the following.

2.2 Special Nature of OSD

There is considerable research on the special nature of IS offshoring, although not in the specific context of OSD. Generic offshore characteristics, or issues, include: cultural (Winkler et al. 2008), geographic (Carmel and Agarwal 2002), geo-political (Ranganathan and Balaji 2007), infrastructure (Rao 2004), language (Zatolyuk and Allgood 2004), legal and security (Balaji and Ranganathan 2006), as well as time zone issues (Rottman and Lacity 2004). These characteristics are also referred to as distance measurers because each of them implies a certain type of distance between client and supplier (Dibbern et al. 2008).

Beside these common issues, OSD differs significantly from IS offshoring (Niederman et al. 2006): First, OSD is a complex and intensive process comprising many steps (planning, coding, testing, implementation, maintenance, etc.). Second, OSD requires significant knowledge of a company and its industry. This is particularly true for the development of individual software. Third, OSD demands for a high level of hard skills (e.g., programming). Finally, OSD is not only a technical but also a social process which requires close cooperation and coordination among a diverse set of stakeholders (Beath 1987; Kirsch 1997). For these reasons, we believe that research results from IS offshoring cannot simply be transferred to OSD (and vice versa). This opinion is also shared by Niederman et al. (2006).

3 Multi-Perspective Research Framework

To structure prior literature in the OSD domain, we developed a multi-perspective research framework. This framework is illustrated in Figure 1. The three framework perspectives as well as the eight associated dimensions are introduced and discussed in the following sections.

Figure 1: Research framework perspectives and dimensions

3.1 Research Focus

In practice, a multitude of variations of OSD have emerged. To create a consistent understanding of relevant concepts, Amberg and Wiener (2006) distinguish among the function (What services?), the degree (To what extent?) and the ownership (What model?) of an IS offshoring project. Due to our focus on OSD, we already narrowed down our research in terms of function (application) and degree (selective). This restriction is consistent with the predominant use of IS offshoring in practice (Delmonte and McCarthy 2003; Dibbern and Heinzl 2009).

In addition, based on Westner and Strahringer (2007), Wiener (2006), as well as Dibbern et al. (2004), we were able to identify three more research dimensions of OSD: distance (From and to whom?), point of view (Which stakeholder group?), and stage (Which phase?).

Table 1 gives an overview of the resulting four dimensions (in alphabetical order) and the associated concepts.

Table 1: Overview of "research focus" dimensions and concepts

Dimension	Concepts				
Distance	Nearshore			Farshore	
Ownership	Internal		Partial		External
Point of view	Client		Consultant		Supplier
Stage	Why	What	Which	How	Outcome

Distance: From the point of view of a German client company, countries such as the Baltic States, the Czech Republic, or Poland are regarded as nearshore countries. Potential farshore countries include India, China, and other similarly distant nations or regions, again observed from a German client point of view.

Ownership: Software services can be offshored to a captive organizational unit which is located in a foreign country (internal). If such a unit is owned by both client and vendor, this is referred to as joint venture or strategic alliance (partial). If the ownership is completely handed over to a third party vendor, we call this traditional offshore outsourcing (external).

Point of view: By definition, OSD incorporates the relocation of software services from a client organization to some kind of supplier organization. Hence, we can differentiate between the client and supplier point of view. Moreover, the client or the supplier may ask for support by a consulting firm.

Stage: OSD initiatives can be divided into several phases or stages. Dibbern et al. (2004) adapted Simon's (1960) decision making model and derived a five-stage IS outsourcing model. Westner and Strahringer (2007) transferred this model to IS offshoring, thereby confirming its suitability for OSD. The resulting stages are:

- "Why" examines the determinants (potential benefits and risks) that lead to the consideration of OSD as a sourcing option.

- "What" looks at the different design alternatives of an OSD arrangement with regard to structural aspects (e.g., degree and ownership).
- "Which" involves the decision to offshore (or not to offshore). It deals with the procedures, guidelines, and stakeholders to evaluate and make the OSD decision.
- "How" analyzes the implementation of the OSD decision, especially the organization and the management of a corresponding project.
- "Outcome" addresses the results of the OSD implementation. It relates to best practices as well as types and determinants of success.

Contrary to Dibbern et al. (2004), we consider the supplier selection as part of the "which"-stage as it is often closely connected with the general OSD decision.

3.2 Reference Theory

The field of IS outsourcing / offshoring can be traced back to numerous theories. All of these theories may prove to be useful for determining which software services shall be offshored and how these services shall be managed.

Dibbern et al. (2004) adapted the structuring approach of Kim and Lee (1999), hereby combining relevant theories into three categories (in alphabetical order):

- *Economic theories* concentrate on the coordination and the regulation of economic agents or units in regard to their interactions with one another. References theories of this category include: agency theory, theory of comparative advantage, and transaction cost theory.
- *Social and organizational theories* focus on different types of relationships that exist between individuals, groups, and organizations. Relevant reference theories are: power and politics theories, relationship theories, and social exchange theory.
- *Strategic theories* deal with a company's efforts for developing and implementing strategies which give it a (sustainable) competitive advantage. This category comprises reference theories like: resource-based theory, resource dependency theory, and strategic management theories.

3.3 Research Approach

Galliers (1991) differentiates between research approaches and methods. While approaches are generic ways of doing research, methods are more focused techniques and procedures for conducting research. For this reason, Dibbern et al. (2004) consider methods as one dimension of a research approach. Another dimension is the epistemology (Lee 1991; Orlikowski and Baroudi 1991).

By adopting Dibbern et al.'s (2004) view on research approaches, we first differentiate between empirical and non-empirical approaches based on whether some kind of empirical method was used or not. The resulting two groups are further divided into sub-groups in terms of epistemological types.

With regard to the *empirical approach*, we distinguish between two basic types of epistemology: interpretivism and positivism. Furthermore, consistent with Dibbern et al. (2004), we treat descriptivism as a separate type of epistemology.
According to Dibbern et al. (2004), a *non-empirical approach* can either be classified as conceptual or mathematical. In terms of epistemology, both types are positivist in nature. Typically, conceptual research aims at developing frameworks or providing management guidelines. Mathematical research usually deals with numeric models and analyses which are based on a set of restrictive assumptions.

4 Literature Review Procedure

4.1 Identification Process

The identification process involved four sub-steps: conference and journal definition, time frame definition, manual search, and database search.

In our review, we focused on the top international IS journals. Beside the "senior scholars' basket" of IS journals (AIS 2009), we included three other renowned and three niche IS journals due to their focus on global IS issues. Because of the relative newness of OSD (Delmonte and McCarthy 2003), our review also comprised major IS conferences. To ensure that our bibliography was as inclusive as possible, we also considered top management journals. Taking into account the strong applied nature of OSD, we scanned applied management journals as well. Table 2 gives an overview of included sources (listed alphabetically by category).

Table 2: Overview of journals and conferences

IS Journals	Niche IS Journals
Communications of the ACM (CACM)	Information Systems Frontiers (ISF)
Communications of the AIS (CAIS)	Journal of Global Inf. Mgmt. (JGIM)
European Journal of Inf. Sys. (EJIS)	Journal of Gl. Inf. Tech. Mgmt. (JGITM)
Information Systems Journal (ISJ)	Management Journals
Information Systems Research (ISR)	Academy of Management Journal (AMJ)
Information & Organization (I&O)	Academy of Management Review (AMR)
Journal of the Association for Inf. Sys. (JAIS)	Administrative Science Quarterly (ASQ)
Journal of Management Inf. Sys. (JMIS)	Decision Sciences (DS)
MIS Quarterly (MISQ)	Management Sciences (MS)
IS Conferences	Organization Sciences (OS)
Americas Conference on Inf. Sys. (AMCIS)	Strategic Management Journal (SMJ)
European Conference on Inf. Sys. (ECIS)	Applied Management Journals
Hawaii Int. Conf. on Sys. Sciences (HICSS)	California Management Review (CMR)
International Conference on Inf. Sys. (ICIS)	Harvard Business Review (HBR)
Wirtschaftsinformatik (WI)	Sloan Management Review (SMR)

The Y2K problem can be seen as an initial driver of OSD worldwide (Amoribieta et al. 2001). For this reason, we limited our literature review to publications between the years 1999 and 2009 (through August). By spanning a ten year period, we believe that our review covers an adequate time frame.
To identify relevant articles, we manually examined the mentioned journals and conference proceedings during June and July 2009. In this process, we broadly searched for keywords like "offshoring", "offshore", "outsourcing" in the article titles and abstracts. Based on the manual search, we identified 443 publications.

To double-check the completeness of our identification process, we conducted an additional database search for all of the included journals and conference proceedings in August 2009. Here, we used advanced search methods including Ferber's (2003) stemming approach and the unlimited truncation option. By entering both "offshor*" and "outsourc*" as search terms, we were able to find articles which do not explicitly refer to offshoring but to "global" or "international" outsourcing. The automated search resulted in a preliminary list of 519 items.

By concentrating on a limited number of sources, we excluded a large body of research work (other journals, doctoral theses, etc.). However, we believe that this pre-selection resulted in a representative set of articles from high-quality sources.

4.2 Selection Process

In an endeavor to select publications with a primary focus on OSD, we read each paper's abstract and introduction. A similar approach was first used by Swanson and Ramiller (1993), and also applied by Dibbern et al. (2004).

Further, we excluded non-relevant articles in the style of Westner and Strahringer (2007), i.e., papers which do not have a managerial but an educational, global economic, or technical focus. Additionally, we excluded conference papers that resulted in a journal article, papers with no original content (e.g., forewords), research in progress papers, as well as papers with a length of less than four pages.

Following this process, we had to exclude 446 items from our preliminary list. Consequently, 73 articles solely focusing on OSD were included in our analysis.

4.3 Classification and Analysis Process

Each selected publication was first classified according to the perspectives and the associated dimensions of our research framework. To do so, we read the paper's key sections (introduction, discussion, and conclusions). This procedure conforms to the general approach proposed by Swanson and Ramiller (1993).

The paper classification required some degree of interpretation on our part. While some papers explicitly referred to the concepts included in our framework, others were less clear. In addition, some papers dealt with multiple concepts within one dimension. Each of these papers was assigned to the single concept to which it most strongly belongs (compare Table 4 in the appendix).

Finally, we analyzed the classified articles along the perspectives of our framework. Here, we developed literature maps for each perspective. These literature maps allowed us to identify major OSD themes and trends, as well as to point out opportunities and suggestions for future research in the field of OSD.

5 Results

5.1 General Observations

Since the end of the 20th century, we found a steady increase in the number of OSD publications per year (except for 2003). While only one relevant paper was published in the selected sources in 1999, 2000 and 2001, almost 20 papers were published in 2008 (compare Table 3 in the appendix). This finding confirms the rising attention directed to OSD. Furthermore, it approves the appropriateness of the time frame selected for our literature review.

More than half of the selected OSD publications were published in IS conference proceedings. To some extent, this can be traced back to the time-consuming journal review process. However, it also demonstrates that not all journals have yet recognized the growing importance of OSD. While some journals have reacted on this development by publishing special issues on IS offshoring in recent years (e.g., MISQ in 2008), others have completely ignored this topic so far.

Finally, it is noticeable that the two IS conferences with a US focus (HICSS, AMCIS) rank first and second in regard to the number of OSD publications. In contrast, the most prestigious German IS conference (WI) has only published one paper on OSD in the last ten years. One possible reason for this discrepancy may be given in the lower maturity and the smaller size of the German IS offshoring market compared to the US and the UK market (Broß 2005; Buchta et al. 2004). Against the background of significant market growth potential, we see an urgent need for OSD research from a German client point of view.

5.2 Research Focus

Stage: More than half of the selected publications focus on the implementation of an OSD arrangement (compare Figure 2). Major topics in the "how"-stage include the management of cultural issues, virtual teams, and the client-supplier relationship as well as the control and coordination of an OSD project. The great majority of these publications point up relevant management aspects and provide respective guidelines. However, none of these studies presents management (software) tools for addressing the identified aspects and implementing the suggested guidelines. In this context, a more practical-driven approach would be beneficial to both the significance of OSD research and the quality of OSD project management.

In general, it is noticeable that research seems to concentrate on the later stages of an OSD arrangement ("how" and "outcome"). In total, 52 publications deal with the implementation and the success of an OSD initiative. By contrast, less than

one third of the selected articles are concerned with the pre-implementation stages of an OSD project. Here, the low number of decision-related papers is particularly remarkable. This research deficit is also confirmed by Westner and Strahringer (2007) in their extensive literature review on IS offshoring.

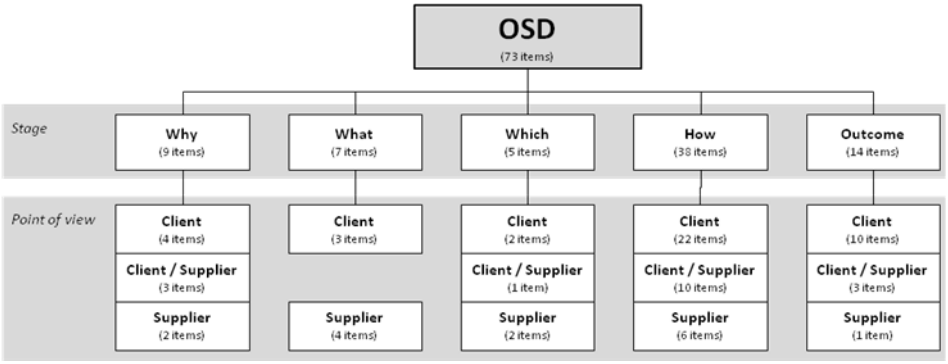

Figure 2: Selected OSD literature items by stage and point of view

Point of view: Research on OSD predominantly takes on a client point of view. This is particularly true for the later stages of an OSD arrangement. About half of the selected papers examine the management and the success of an OSD project from such a point of view. Including those papers which consider the "how"- and "outcome"-stage from both client and supplier perspective, this subset represents by far the biggest research cluster with 45 literature items. While at least some papers analyze the later OSD stages from a supplier point of view (7 items), we were not able to find any papers from a consultant point of view.

With respect to the preparatory OSD stages ("why", "what", and "which"), we were able to observe a more balanced picture between the client and the supplier point of view. This finding is particularly surprising as, at first glance, these stages address client-focused questions in particular: Why engage in OSD? What sourcing model? Which project, country, and supplier? etc. The relatively high number of supplier-related research papers within these early stages can be traced back to papers dealing with in-house OSD activities of large-scale multinational IS service providers (e.g., Accenture, HP, and IBM). These supplier companies typically leverage their global network of software development centers, thereby acting as a "client within the supplier". However, we believe that such a "client" can neither be equated with an internal client (of a subsidiary) nor an external client (of a third party vendor) because all of its actions are embedded in an overall supplier context. Therefore, we classified these papers as supplier-oriented.

Ownership: OSD research concentrates on offshore outsourcing, i.e., the relocation of software services to an external third party vendor (58 literature items). In contrast, offshoring to internal subsidiaries (9 items) or joint ventures is only sparely or not at all discussed in prior literature. Moreover, some papers refer to OSD in general, not mentioning the specific OSD ownership model under study (6 items).

This lack of information significantly reduces the trustworthiness of the research results in terms of credibility and transferability (Guba and Lincoln 1985).

Distance: The vast majority of prior OSD research papers concentrate on farshoring (61 literature items). Even though most of these papers do not explicitly define farshoring as their research focus, they implicitly do by specifying an origin (e.g., the United States) and a destination country (e.g., India). On the contrary, we only found 2 literature items which solely focus on nearshoring. Additionally, 10 items consider OSD at large, neither referring to the client nor the supplier country under investigation. From our perception, such an inaccurate description of the concrete research unit represents a major shortcoming of current OSD research. Consistent with Niederman et al. (2006), we believe that research results can only apply to a specific set of OSD variations.

5.3 Reference Theory

Generally, it has to be highlighted that more than two thirds of the selected OSD publications lack a clear theoretical foundation (compare Figure 3). This finding is particularly noteworthy for two reasons: First, because our literature review only encompassed renowned high-quality academic sources. Second, because IS outsourcing research has already identified a significant number of theories (Dibbern et al. 2004) which might also be relevant to OSD. The prevailing theoretical lack could be interpreted as one major reason why OSD research has been completely disregarded by some top IS and management journals until now.

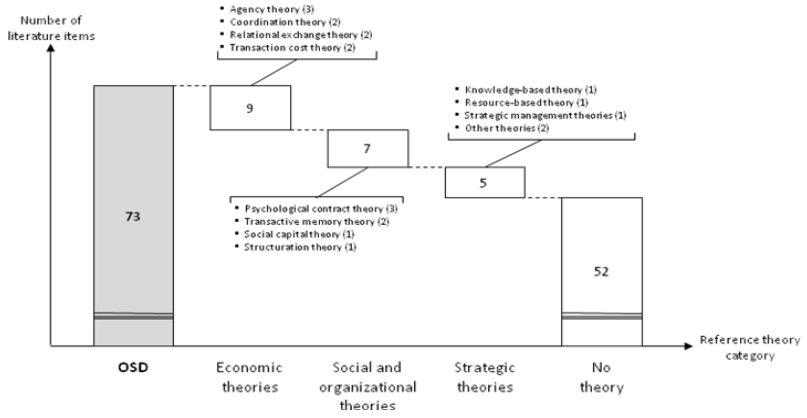

Figure 3: Theoretical foundations of selected OSD literature items

Regarding our classification of reference theories into economic, social and organizational, and strategic theories, no single category was predominant. Those 21 literature items which explicitly refer to a theory are spread over the three categories in almost equal measure. Also with regard to the individual reference theories, we were not able to single out a dominant theory. The two most

frequently applied theories are agency and psychological contract theory (both 3 items). Here, it is particularly noticeable that even popular IS outsourcing theories, like transaction cost theory (Dibbern et al. 2004), are not more frequently used. This shortcoming might be explained by the fact that the OSD research community is still in the process of establishing an initial understanding of the phenomenon and its underlying theories (Westner and Strahringer 2007).

5.4 Research Approach

The great majority of the selected OSD research papers employ some kind of empirical method (63 literature items), with a predominance of the case study method (40 items). In regard to both empirical and non-empirical research papers, the use of the respective epistemologies is (almost) balanced. Figure 4 illustrates the distribution of the papers along the two major dimensions of a research approach.

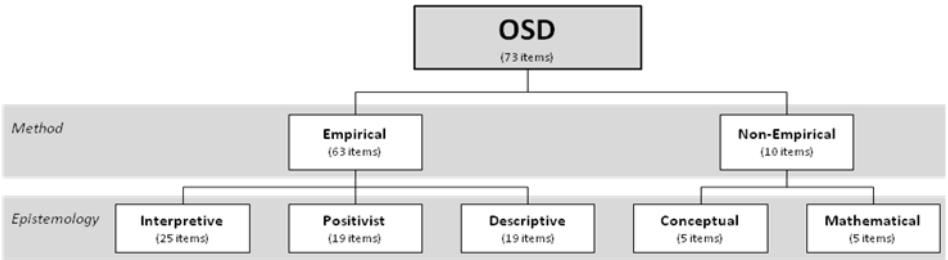

Figure 4: Selected OSD literature items by method and epistemology

Consistent with Alavi et al.'s (1989) general finding in IS research, positivist research also dominates the OSD research stream, followed closely by interpretive research. In total, 29 literature items (including conceptual and mathematical items) have conducted their research through a positivist epistemological lens. This may be explained by the prevalence of North American IS (e.g., ISR and MISQ) and management journals (e.g., AMJ and AMR) in our review. While European journals seem to be more receptive to interpretive and descriptive research, these journals tend to prefer positivist research (Walsham 1995).

6 Summary and Discussion

In this paper, we systematically reviewed and analyzed the current status of OSD research from an organizational perspective. Based on Dibbern et al. (2004), we developed an OSD research framework consisting of three perspectives – namely, research focus, reference theory, and research approach – and eight associated dimensions. By organizing relevant concepts, the framework enables a common understanding of basic terms, thereby facilitating future OSD research.

The developed framework formed the basis for our analysis of prior academic OSD literature. The analysis results confirmed the appropriateness of our framework and revealed directions for future research along the framework perspectives:

- *Research focus:* Future research should pay particular attention to the preparatory stages of an OSD initiative. In particular, relevant research questions might deal with decision-related aspects. Concerning the later OSD stages, the design and the development of project management tools and outcome measurement systems would be desirable. Across all stages, future OSD research should not only concentrate on the client point of view, but incorporate multiple points of view. The integration of different stakeholder perspectives might also enhance the robustness of research results. Moreover, future research should examine the special nature of nearshoring and captive offshoring. Based on such research, comparisons between different OSD variations could be drawn.
- *Reference theory:* OSD research papers frequently lack any theoretical foundation. Therefore, first of all, researchers should aim at building their OSD research studies on some kind of reference theory. In this context, particularly popular economic theories like agency theory (e.g., in terms of OSD project control) and transaction cost theory (e.g., in terms of OSD project decision) still offer a high potential for future research.
- *Research approach:* Due to the current focus on positivist research, a stronger emphasis on (qualitative) interpretive research would be eligible. This might also contribute to an increasing diffusion of OSD articles in European journals. Here, beside case study research, the application of other qualitative methods (e.g., action research or grounded theory) as well as design research approaches should be taken into account.

In summary, the paper has significant implications for researchers. Most importantly, it clearly points to the need for further research on OSD. For instance, from the perspective of German client companies, a significant research backlog exists. By providing respective research results, researchers can support German firms in their efforts to effectively leverage OSD services.

When designing, implementing, and writing down an OSD research project, researchers should make sure that they provide an accurate description of the unit under study. Here, researchers may use our proposed OSD research framework to systematically classify and describe their study. This might contribute to significantly increase the trustworthiness of their research results (Guba and Lincoln 1985). Only by precisely understanding the research context, both other researchers and practitioners can correctly interpret and build on existing results.

In conclusion, one major opportunity for future research emerges from this study. The paper developed a basic OSD research framework and revealed future research directions. To gain a more detailed understanding of these directions, a dedicated content analysis of the selected OSD papers is required. Such an analysis may generate valuable insights for future research and management of OSD.

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Appendix

Table 3: Selected OSD literature items by year and source

	(Niche) IS Journals												*IS Conferences*					*(Applied) Management Journals*										
Year	CACM	CAIS	EJIS	ISJ	ISR	I&O	JAIS	JMIS	MISQ	ISF	JGIM	JGITM	AMCIS	ECIS	HICSS	ICIS	WI	AMJ	AMR	ASQ	DS	MS	OS	SMJ	CMR	HBR	SMR	**Σ**
1999	1																											**1**
2000															1													**1**
2001						1																						**1**
2002									1						1													**2**
2003					1	1							4		3							1						**10**
2004	1					1								2	1													**5**
2005			1								2		1		2													**6**
2006	1										1		2	1	1	3												**9**
2007	1		1			1						2	3	2	1	1												**12**
2008	1	1		1	1				6	1	1	1		1	1	2												**17**
2009	1										1	2	2		2		1											**9**[1]
Σ	**6**	**1**	**2**	**1**	**2**	**4**	**0**	**0**	**7**	**1**	**5**	**5**	**12**	**6**	**13**	**6**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**73**

[1] Including publications through August 2009

Table 4: Classification of selected OSD literature items along framework perspectives / dimensions (sorted by year and author)

				Research Focus				*Reference Theory*		*Research Approach*	
No.	Author(s)	Year	Source	Dis-tance	Owner-ship	Point of view	Stage	Category	Theory	Method	Epis.
1	Heeks	1999	CACM	Far	Ext.	Vendor	What	-	-	Emp.	Desc.
2	Hassan	2000	HICSS	Far	Ext.	Vendor	Why	-	-	Emp.	Desc.
3	Nicholson / Sahay	2001	I&O	Far	Ext.	Client	How	-	-	Emp.	Interp.
4	Ramesh / Dennis	2002	HICSS	Far	Ext.	Vendor	How	-	-	Emp.	Desc.
5	Walsham	2002	MISQ	Far	Ext.	Client	How	Social	Structuration	Emp.	Interp.
6	Choudhury / Sabherwal	2003	ISR	Far	Ext.	Client	How	Strategic	Strategic management	Emp.	Interp.
7	Gallaugher / Stoller	2003	AMCIS	Far	Ext.	Vendor	Which	-	-	Emp.	Interp.
8	Gopal et al.	2003	MS	Far	Ext.	Vendor	What	-	-	Emp.	Pos.
9	Sá et al.	2003	AMCIS	Far	Int.	Client	Outcome	-	-	Emp.	Desc.
10	Sabherwal	2003	I&O	Far	Ext.	Client / Vendor	How	-	-	Emp.	Interp.
11	Damian / Zowghi	2003	HICSS	Far	Ext.	Client / Vendor	How	-	-	Emp.	Desc.
12	Delmonte / McCarthy	2003	AMCIS	-	Ext.	Client	Why	-	-	Non-emp.	Conc.

13	Edwards / Sridhar	2003	HICSS	Far	Ext.	Client	How	-	-	Emp.	Pos.
14	Khan et al.	2003	HICSS	Far	Ext.	Client / Vendor	Why	-	-	Emp.	Desc.
15	Sharma	2003	AMCIS	Far	Ext.	Vendor	How	-	-	Emp.	Interp.
16	Espinosa / Carmel	2004	HICSS	Far	Ext.	Client / Vendor	Which	Economic	Coordination	Non-emp.	Math.
17	Hanisch / Corbitt	2004	ECIS	Far	Ext.	Vendor	How	-	-	Emp.	Interp.
18	Krishna et al.	2004	CACM	Far	Ext.	Client	How	-	-	Emp.	Desc.
19	Lane / Ågerfalk	2004	ECIS	Far	Ext.	Client / Vendor	Why	Social	Psychol. contract	Emp.	Interp.
20	Nicholson / Sahay	2004	I&O	Far	Int.	Client	How	-	-	Emp.	Interp.
21	Carmel / Nicholson	2005	JGIM	Far	Ext.	Client	How	Economic	Transaction cost	Emp.	Desc.
22	Balaji / Ahuja	2005	HICSS	-	Ext.	Client / Vendor	Outcome	Strategic	Knowledge-based	Emp.	Pos.
23	Edwards / Sridhar	2005	JGIM	Far	Ext.	Client	How	-	-	Emp.	Pos.
24	Evaristo et al.	2005	HICSS	Far	Int.	Client	What	-	-	Non-emp.	Conc.
25	Kim / Meso	2005	AMCIS	Far	Ext.	Vendor	What	-	-	Non-emp.	Conc.

26	Kotlarsky / Oshri	2005	EJIS	Far	Int.	Client	Outcome	Social	Transactive memory	Emp.	Interp.
27	Ågerfalk et al.	2006	ICIS	Far	Ext.	Client	How	Social	Psychol. contract	Emp.	Interp.
28	Batra et al.	2006	AMCIS	Far	Ext.	Vendor	How	-	-	Non-emp.	Conc.
29	Erickson / Ranganathan	2006	HICSS	Far	Ext.	Client	Why	Strategic	Resource-based	Emp.	Desc.
30	Holmström et al.	2006	ICIS	Far	Ext.	Client / Vendor	How	Economic	Relational exchange	Emp.	Interp.
31	Kotlarsky et al.	2006	ICIS	Far	Ext.	Client / Vendor	How	-	-	Emp.	Interp.
32	Niederman et al.	2006	JGIM	Far	Ext.	Client	Which	Strategic	Human capital	Emp.	Desc.
33	Ramesh et al.	2006	CACM	Far	Ext.	Client	How	-	-	Emp.	Desc.
34	Smolander et al.	2006	ECIS	Far	Ext.	Vendor	How	-	-	Emp.	Interp.
35	Xu / Yao	2006	AMCIS	Far	-	Client / Vendor	How	Social	Social capital	Emp.	Pos.
36	Kotlarsky et al.	2007	JGITM	Far	Int.	Client	How	Social	Transactive memory	Emp.	Interp.
37	Bagchi et al.	2007	AMCIS	-	Ext.	Client	Outcome	-	-	Non-emp.	Math.
38	Carmel / Abbott	2007	CACM	Near	Ext.	Client	Why	-	-	Emp.	Pos.

39	D'Mello / Sahay	2007	I&O	Far	Ext.	Vendor	How	-	-	Emp.	Interp.
40	Gannon / Wilson	2007	ECIS	-	-	Client	What	-	-	Non-emp.	Conc.
41	Hanisch / Corbitt	2007	EJIS	Far	Ext.	Client / Vendor	How	-	-	Emp.	Interp.
42	Noonan et al.	2007	ICIS	Far	Ext.	Client / Vendor	How	-	-	Emp.	Interp.
43	Rao et al.	2007	JGITM	Far	Int.	Client	How	-	-	Emp.	Desc.
44	Sutherland et al.	2007	HICSS	Far	Ext.	Vendor	Outcome	-	-	Emp.	Desc.
45	Takahashi / Li	2007	AMCIS	Near	Int.	Vendor	Why	-	-	Emp.	Desc.
46	Upadhyaya / Krishna	2007	ECIS	Far	Ext.	Client	How	-	-	Emp.	Pos.
47	Zhang et al.	2007	AMCIS	Far	Ext.	Client	How	-	-	Emp.	Pos.
48	Ågerfalk / Fitzgerald	2008	MISQ	-	-	Client	Outcome	Social	Psychol. contract	Emp.	Interp.
49	Levina / Vaast	2008	MISQ	Far	Ext.	Client	How	-	-	Emp.	Interp.
50	Adya et al.	2008	CAIS	Far	Ext.	Client	How	-	-	Emp.	Desc.
51	Alami et al.	2008	JGITM	Far	Int.	Client / Vendor	How	-	-	Emp.	Desc.

52	Chia et al.	2008	MISQ	Far	Ext.	Client	Which	-	-	Non-emp.	Math.
53	Dibbern et al.	2008	MISQ	Far	Ext.	Client	Outcome	Economic	Transaction cost	Emp.	Pos.
54	Fabriek et al.	2008	ECIS	-	-	Client	Outcome	-	-	Emp.	Pos.
55	Gopal / Sivaramak.	2008	ISR	Far	Ext.	Vendor	What	-	-	Emp.	Pos.
56	Holmström et al.	2008	MISQ	Far	Ext.	Client / Vendor	How	Economic	Relational exchange	Emp.	Interp.
57	Huang / Trauth	2008	ICIS	Far	Ext.	Client	How	Economic	Coordination	Emp.	Interp.
58	Iacovou / Nakatsu	2008	CACM	Far	Ext.	Client	Why	-	-	Emp.	Pos.
59	Käkölä	2008	HICSS	-	Ext.	Client	How	-	-	Emp.	Pos.
60	Nath et al.	2008	JGIM	Far	Ext.	Client / Vendor	Outcome	Economic	Agency	Emp.	Pos.
61	Ramasubbu et al.	2008	MISQ	Far	Ext.	Client	Outcome	-	-	Emp.	Pos.
62	Remus / Wiener	2008	ISJ	Far	Ext.	Client	Outcome	-	-	Emp.	Interp.
63	Winkler et al.	2008	ISF	Far	Ext.	Client	How	-	-	Emp.	Desc.
64	Zimmermann et al.	2008	ICIS	-	Int.	Vendor	Which	Strategic	Modern portfolio	Non-emp.	Math.
65	Ghosh	2009	JGITM	-	Ext.	Client	How	-	-	Non-emp.	Math.

66	Yadav et al.	2009	JGIM	Far	Ext.	Client / Vendor	Outcome	Economic	Agency	Emp.	Pos.
67	Carmel et al.	2009	HICSS	Far	-	Client	How	-	-	Emp.	Pos.
68	Dafoulas et al.	2009	HICSS	Far	Ext.	Client / Vendor	How	-	-	Emp.	Pos.
69	Gradel / Nosek	2009	AMCIS	-	Ext.	Client	Outcome	-	-	Emp.	Pos.
70	Gupta	2009	CACM	Far	Ext.	Client / Vendor	Why	-	-	Emp.	Desc.
71	Prifling et al.	2009	WI	Far	Ext.	Client	How	Economic	Agency	Emp.	Interp.
72	Prikladnicki / Audy	2009	AMCIS	Far	-	Client	What	-	-	Emp.	Desc.
73	Remus / Wiener	2009	JGITM	Far	Ext.	Client	Outcome	-	-	Emp.	Interp.