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ABSTRACT

IT management increasingly involves teams dispersed throughout a globalized world in internal as well as outsourced projects. In this work, we focus on the latter and analyze the impact of social network structures between vendor and client team members on project success. We present the findings of a comprehensive literature analysis and give an outlook on the ongoing empirical investigation. The goal is to propose a model linking structural properties of social networks to dimensions of success of outsourced IT projects. We base this model on indications found in prior research and the results of explorative case studies in outsourcing arrangements. Our findings so far show that the network density at the client-vendor interface and the multiplexity of ties are the salient, but not sole, network properties for which existing research implies an influence on success of outsourced IT projects. Case studies will reveal how and why these and other social network properties have an impact on project success.

Keywords

Outsourced-project success, social network structure, distributed teams, outsourcing, case study design

INTRODUCTION: RESEARCH OBJECTIVES AND QUESTION

Recent research on IS project management and distributed teams has shown the relevance of relationship factors like trust and communication for project management aspects such as status reporting and virtual teams (Iacovou, Thompson and Smith, 2009; Thomas and Bostrom, 2010). In their literature review on trust in virtual teams, Mitchell and Zigurs (2009) identify "patterns and extent of communication" as trust building input factor. Outsourcing and offshoring arrangements are important domains of distributed collaboration and management of teams, particularly in software development projects. Therefore, we aim at transferring these insights and suggest that the structure of social networks (SNs) between individuals should be considered in managing outsourced projects. In this vein, research on outsourced and/or offshored IS projects has increasingly included the organizational relationships in their analysis, e.g. concerning the impact of trust and control in project performance (Mao, Lee and Deng, 2008) or relational mechanisms driving offshore project success (Rai, Maruping and Venkatesh, 2009). We add to this trend by considering the cross-organizational relationships between vendor and client team members from a SN structure perspective. This individual level has so far been examined in only few publications (e.g. Ho, Ang and Straub, 2003; Kern and Willcocks, 2002; Leonardi and Bailey, 2008), and therefore promises new insights.

Koh, Ang and Straub (2004) have shown that outsourcing success is clearly related to the building of effective *cross*-organizational teams. The organizational boundary between client and vendor defines an interface within the team which differentiates outsourced projects from internal projects. Therefore, we believe that the structure of inter-personal interaction at the client-vendor interface is relevant for the success of outsourced projects. This raises the research question: *How do social network structures between individuals in outsourcing relationships influence success of outsourced IT projects?* We strive to answer this question through explorative case studies. We build the empirical investigation on a broad analysis of outsourcing literature, which uncovered implicit and explicit hints on SN structures and their links to success of outsourced IT projects.

THEORETICAL FOUNDATIONS

Social Network Analysis

Social network analysis is a method for analysis of social structures in terms of ties between individual actors (Otte and Rousseau, 2002). SNs in this context are not to be confused with "online social networks" such as Facebook or myspace. In contrast, we analyze "networks of individual relations that people foster, maintain, and use in the course of their daily lives" (Otte and Rousseau, 2002, p. 442).

When analyzing SNs, we distinguish structural, individual, and tie properties (Wasserman and Faust, 1997). Structural properties describe characteristics of the network as a whole and its structure formed by links between actors, while individual properties describe characteristics of single actors that are based on their position within the network. Tie properties concern individual ties between two actors. Ties can differ in content: exchange of affect (e.g. friendship), exchange of influence or power, exchange of information, or exchange of goods and services, all of which can be further differentiated (Tichy, Tushman and Fombrun, 1979). In the following, we introduce the SN structure concepts we identified to be particularly relevant in extant outsourcing literature (Schroiff, Beimborn and Weitzel, 2010).

Structural properties help to formalize the interactions and relationships of team members at the interface between client and vendor. An important property is the network's *density*. It is defined as "the proportion of possible lines [i.e. ties] that are actually present" in the network (Wasserman and Faust, 1997, p. 101). At the interface between two groups, it ranges from a fully interconnected network to the gatekeeper model. We consider this the *interface density* at the interface between client and vendor.

Individual properties stem from an actor's position within the SN structure and can help to understand the roles of individual actors for the network.

Based on the network density at the interface, *gatekeeper* or *interface actors* can be identified. A *gatekeeper* is well connected in its own group and is the exclusive link to another group (Tichy et al., 1979); e.g., actor A in figure 1 on client side. If the link between client and vendor is not exclusive to one actor, but still funneled through a restricted number of actors, we call these *interface actors,* e.g., actors B and C in figure 1 on vendor side.
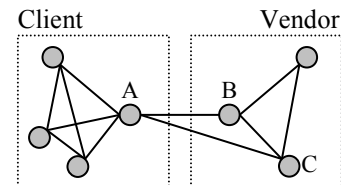

Figure 1: Gatekeeper and Interface Actor

Another relevant characteristic of an actor is *prestige*. A network measure for prestige is the degree of an actor which is defined as the number of connections to other actors in the network (Wasserman and Faust, 1997). Depending on the tie content captured in the network, prestige can measure the access to critical resources (Jansen, 2006).

Tie properties specify relationships or connections between two actors in the network. In our context, this mostly refers to a relationship between one team member on client side and one on vendor side.

Different levels of communication, knowledge exchange, and trust appear between actors in outsourcing relationships (e.g. Koh et al., 2004; Rai et al., 2009). This reflects *multiplexity* of ties, which means two actors are connected by multiple ties with different content (e.g. knowledge exchange and friendship). We expect multiplex ties to be beneficial for cross-organizational project teams as they contribute to trust building between client and vendor.

The frequency of interaction supports knowledge exchange between client and vendor team members. It is a proxy for *intensity*, which measures the strength of a tie (Granovetter, 1973; Wasserman and Faust, 1997).

Clarity of expectations refers to "the degree to which every pair of individuals has clearly defined expectations about each other's behavior" (Tichy et al., 1979, p. 508). This is of importance especially when analyzing collaboration within mixed client-vendor teams.

Success of outsourced projects

In our research we examine the influence of SN structures on outsourced-project success. We map the main project success criteria found in project management literature: cost, time, quality, strategic objectives and satisfaction of end-users and stakeholders (Ika, 2009) and the central outsourcing success criteria by Grover, Cheon and Teng (1996) and Kettinger and Lee (1994). Building on these, we describe a twofold construct of outsourced-project success from the client's perspective, entailing a long-term dimension of goal achievement and a short-term dimension of operational satisfaction.

Goal achievement refers to various benefits, as defined by Grover et al. (1996). We distinguish economic, technological, and strategic benefits. *Economic benefits* concern cost advantages from economies of scale and a beneficial cost structure (Grover et al., 1996). *Technological benefits* stem from access to up-to-date technology and technical capabilities (Grover et al., 1996), which we map to the long-term aspect of quality in project success. *Strategic benefits*

Social network		Outsourced project success
Structural properties		Goal achievement
Interface density		Economic benefits
	Guiding	Technological benefits
Individual properties	Hypothesis	Strategic benefits
Prestige		
		Operational satisfaction
Tie properties		Reliability
Multiplexity		Responsiveness
Intensity (Strength)		
Clarity of Expectations		

Figure 2: SN properties affect outsourced-project success

concern the business goals and strategies of a firm, which can be better fulfilled, e.g., by outsourcing routine activities or by innovating trough IT (Grover et al., 1996). This equals the strategic objectives within project success and influences long-term stakeholder satisfaction. As the other types of benefits can contribute to this goal, we understand strategic benefits as the remainder of goal achievement, which is not covered by economic and technological benefits.

Besides the long-term benefits, we define **operational satisfaction** of end users and other stakeholders through reliability and responsiveness. We base this definition on the SERVQUAL construct adoption for IS, which comprises various service quality measurements (Kettinger and Lee, 1994). *Reliability* refers to the delivery of services, the availability of systems and completion of deliverables in time and budget (Grover et al., 1996; Lee and Kim, 1999). *Responsiveness* describes the vendor's ability and willingness to timely react to changing requirements and occurring problems (Kettinger and Lee, 1994). The operational satisfaction dimension covers time, end-user satisfaction and short-term stakeholder satisfaction dimensions of project success.

Based on these definitions, our research follows the *guiding hypothesis that properties of SNs affect outsourced-project success*, summarized in figure 2.

SN in the outsourcing literature

As starting point to reveal implicit socio-structural assumptions in extant outsourcing research, we analyzed articles published between January 2001 and December 2009 in the extended AIS Senior Scholars' Basket of Journals (MISQ, JAIS, ISR, ISJ, EJIS, JMIS, JSIS, and JIT). A truncated search for "outsourc*" and "offshor*" in title and abstract yielded 91 articles. We excluded 24 as they were either non-peer reviewed editorials or did not focus on an outsourcing situation. We then analyzed the 67 papers regarding (a) the occurrence of implicit or explicit assumptions concerning social structures in outsourcing relationships and (b) implicit or explicit definitions of outsourcing success.

Step (a) involved searching for references to interactions and relationships between individuals in case descriptions, hypotheses and results of quantitative studies or in the arguments of conceptual papers. Structural assumptions manifest in descriptions of structures of communication, knowledge exchange, and trust. They can concern either the macro level (i.e. between organizations) or micro level (i.e. between individuals or teams) of analysis (Dibbern, Goles, Hirschheim and Jayatilaka, 2004). In our analysis, we focus on the level of interaction among individuals between vendor and client since this is the level where interaction structures are filled with life. We found structural
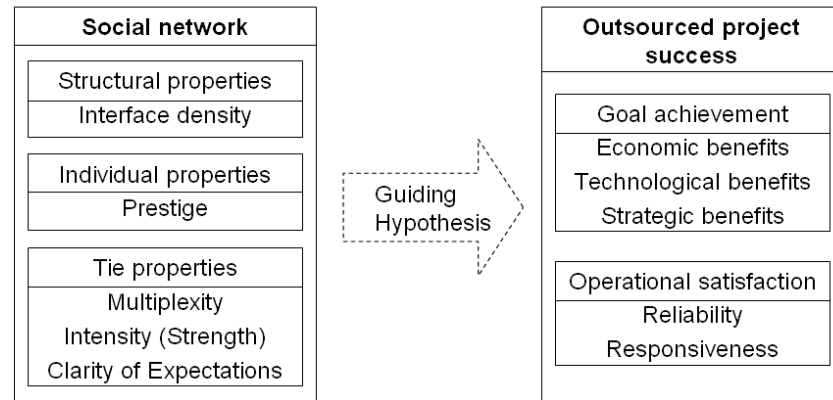
assumptions in 15 papers. The network properties most often identified were interface density, multiplexity and intensity of ties.

Regarding (b), we extracted how outsourcing success was implicitly or explicitly defined in the papers. While this was straightforward for quantitative research, the qualitative papers needed more analysis to identify implicit descriptions of successful outsourcing results. Out of the 15 papers fulfilling (a), we found 7 which also looked at success. All 7 papers used an empirical approach (4 qualitative and 3 quantitative) and software development was the single object of outsourcing considered, except for (Koh et al., 2004), who include various outsourcing objects.

The results of this literature analysis provided the SN properties to start the empirical analysis of social structures and their impact on outsourced-project success.

Balancing Interface Density

We differentiated interface density into *high density*, which is close to a fully interconnected client-supplier team, *interface actors* with several individuals connecting client and supplier groups, and the *gatekeeper model* with a single actor bridging communication between the two groups. We have found indications that these scenarios have varying impact on outsourced-project success:

- *High density* appeared to be relevant for reliability and technological benefits. A high interface density contributes to reliability by facilitating knowledge exchange (Koh et al., 2004).

- The opposing *gatekeeper,* personalized as the project manager, was identified in Levina and Vaast (2008) strengthening reliability.

- Adding team members as *interface actors* indicates an effect on strategic benefits and reliability, e.g. by facilitating communication and collaboration (Kelly and Noonan, 2008; Rai et al., 2009).

Interestingly, we did not find any link to economic benefits for interface density. Since the economic benefits of an outsourced project depend on successful communication of requirements and goals, we would expect an influence of interface density on economic benefits as well.

Fostering Multiplexity

The multiplexity of ties shows a similarly broad effect on outsourced-project success, which supports the intuitive notion that good personal relationships improve collaboration. Multiplexity occurred in various situations and in context with economic benefits (Rottman, 2008), strategic benefits (Zviran, Ahituv and Armoni, 2001) and reliability (Choudhury and Sabherwal, 2003). It mostly referred to social interactions besides business meetings in order to strengthen the relationship and collaboration between client and vendor team members and project managers (e.g., Koh et al., 2004; Sarker and Sarker, 2009). In offshored projects this includes onsite and offshore visits from the other party (e.g., Rai et al., 2009). These visits build a strong connection within a short time when the respective individuals spend entire days together and are involved in free-time activities. In our empirical study we aim to understand which tie contents must be combined to gain most out of multiplexity, and which measures project managers can take to establish it.

Leveling tie intensity

We identified intensity of ties in two papers in the context of success, showing both positive and ambiguous effects (Choudhury and Sabherwal, 2003; Kelly and Noonan, 2008). Also, in the first step of our literature analysis, we already identified a trade-off in the strength of ties (Schroiff et al., 2010). This included scenarios where strong ties hindered contract termination or individual sanctions (Ho et al., 2003; Kern and Willcocks, 2002). This implies that there must be a balanced level of intensity between client and vendor team members. The resulting question is, if and how intensity of ties should be cultivated in outsourced projects. In our case study approach, we strive to gain a better understanding what the right level is and how it relates to the roles and personalities of actors.

Other SN properties

Other SN properties such as clarity of expectations and prestige only showed few links to success (Levina and Vaast, 2008; Rottman, 2008), but indicated relevance for outsourced projects in papers not covering success. *Clarity of expectations* was mentioned for different team settings and must be assured by project management (Dibbern, Winkler and Heinzl, 2008; Koh et al., 2004). High *prestige* can help project managers solve problems by accessing critical (financial or human) resources through their network (Levina and Vaast, 2008). These properties should therefore also be considered in case studies to clarify their relevance.

RESEARCH METHODOLOGY: CASE STUDY DESIGN

We follow a qualitative empirical approach based on explorative case studies. Existing knowledge regarding SN structures between individuals in outsourcing arrangements is scarce and the influence of these aspects on success of outsourced projects not examined. This status quo affords an explorative approach to develop a theoretical model (Eisenhardt, 1989), which will also broaden our knowledge on relevant network properties. The case study design presented here follows Yin (2001).

Case study questions

The research design is based on the hypothesis that properties of SNs between individuals on client and vendor side have an impact on outsourced-project success. Building on our overarching research question "*How do SN structures between individuals in outsourcing relationships influence success of outsourced IT projects?*", we define the case-specific questions to be answered for each case study:

- Which cross-organizational SN patterns appear around the client-vendor interface of an outsourced project?

- How do cross-organizational SN patterns facilitate or constrain outsourced-project success?

- How are the identified SN patterns achieved in the respective setting?

The individual case analysis is followed by a cross-case analysis focusing on these questions:

- How do successful properties in SNs differ between cases?

- What are common SN patterns recurring in different settings?

- Does the advantage of SN properties differ depending on attributes of the outsourcing arrangement?

Unit of analysis

Focus of the case study is the interface between client and vendor employees of an outsourced project. The outsourcing arrangement in focus should involve IT operations, which include tasks such as incidents and change requests that afford ongoing communication, especially software development projects.

Figure 3: Network in Focus

As illustrated in figure 3, the network in focus includes

- Team members on vendor side who are exposed to client employees

- Team members on client side who are exposed to vendor employees

- The first level contacts of the above defined team members on both client and vendor side
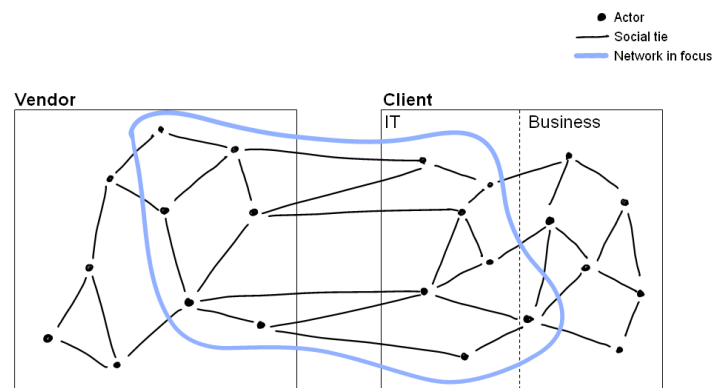
The network is captured by merging individual team members' perspectives on their ties to other actors. Ties are based on interactions and relationships between the actors, e.g., through work processes, emails, and joint lunches.

Context of the case study

Various attributes of the client organization and the outsourcing arrangement frame the context of the cases and will partially be examined in the case studies as basis for a contingency analysis. An explorative approach in the first cases will support selection of the most important context attributes from the following list (table 1), which is based on Cullen, Seddon and Willcocks (2005) and Fink (2010), and in parts supported by Dibbern et al. (2004) and Miranda and Kavan (2005). Later cases will then focus on the most important factors.

	#	Attribute	Description	References	Rationale
Outsourcing Arrangement	1	Scope Grouping	Scope of the outsourcing arrangement including services outsourced, receiving unit in the organization and geographies	Cullen et al., 2005; Miranda and Kavan, 2005	These are the basic attributes of an outsourcing arrangement and thus need to be covered in any analysis of success drivers.
	2	Supplier Grouping	Number of suppliers and type of outsourcing contract	Cullen et al., 2005; Dibbern et al., 2004	Can provide hints on the client's experience in outsourcing.
	3	Financial Scale	Relative and absolute volume of the contract from both perspectives	Cullen et al., 2005	Drives the importance of the arrangement for both client and vendor.
	4	Pricing Framework	Method and benchmarks for measuring performance and calculating payments	Cullen et al., 2005; Miranda and Kavan, 2005	A formalization of the level of control between client and vendor.
	5	Duration	Agreed length of contract	Cullen et al., 2005; Dibbern et al., 2004; Fink, 2010	Important relationship factor for building ties and networks; also relevant for the possibility of terminating the contract.
	6	Resource ownership	Defines which party controls resources	Cullen et al., 2005; Dibbern et al., 2004	Linked to level of control and reflects how tightly the parties are coupled.
	7	Commercial relationship	Relationship structure on organizational level (e.g., related entities vs. independent parties)	Cullen et al., 2005	Formalization of coupling mode; thus influences ease of contract termination and type of relationships.
	8	Relational capability position	Level of processes for knowledge sharing, complementarities of the contractors	Fink, 2010	Reflects coupling mode and goals of the arrangement; knowledge sharing routines are basic factor to build ties and networks.
	9	Internalization	Level of authority systems defined	Fink, 2010; Miranda and Kavan, 2005	Formalization of the level of control between client and vendor.
Organization	10	Organizational IT value proposition	Strategic role of IT within the client organization	Fink, 2010	Influences goals and expectations for outsourcing arrangements and thus perceived success.
	11	Organizational IT asset proposition	Technical and human IT assets of the client organization	Fink, 2010	Influences primary motivation to outsource tasks and thus success.

Table 1. Context attributes to be covered in case studies

Data collection plan

The case process is exploratory driven and based on the theoretical background as derived from literature. The overall goal for each case is to understand the underlying outsourced project and the SN at the interface between client and vendor as well as its impact on outsourced-project success. After each case study, we iteratively detail the basic model (figure 2 on page 3). In order to gain deep insights, exploratory cases are based on semi-structured interviews, but can be complemented by survey instruments and/or diaries. Scenarios structure the interviews and give the interviewee an idea of concrete situations the questions concern. We cover the generic scenarios Change request, Incident (e.g. system failure), Escalation of problems, Daily business. Table 2 gives an overview of the types of instruments used in collecting data. Other data sources can also support data collection. Prior to first case study interviews, basic information on the outsourced project and formal processes can be obtained from documentations such as the outsourcing contract, project plans and process maps. Also, data on automated communication can provide additional insights on the network structures, e.g. collaboration tools, ticketing, or email. Table 3 maps the questions posed for each case to the likely sources of evidence.

	Participants	Goal	Number	Duration	Importance
Pre-case discussion	Personal contact (usually one-on-one)	Understand background and assess relevance; obtain access to additional data sources	1	~1 hour	Optional
Ground-setting interview	Manager (sponsor) responsible for outsourced project	Understand background of outsourced project and agreements on collaboration; define scope of case study	1	~1-2 hours	Obligatory
Case interviews	Vendor and client team members having direct contact to the other party or second level contacts	Build hypotheses on specific network structures, understand outsourcing/project success factors	6-10	~1.5 hours	Obligatory
Network survey	All members (or a relevant sub-unit) of the client-vendor inter-face network (direct contacts +1) as identified in interviews	Capture full network to perform more comprehensive quantitative social network analysis	10-50	10-15 minutes	Optional
Diaries	Interface actors, possibly including second level contacts	Notes recording one week's interaction with other employees on vendor and client side; capture full network, alternative to survey	10-25	1 week 10 min/day	Optional
Deep-dive case interviews	Central actors (as identified in previous steps)	Gain deeper understanding of previously identified pain points or success factors and verify identified network structures	3-8	~1.5 hours	Optional
Repetition	As above	Repeating the above instruments to obtain longitudinal data on the evolution of the social network and its impact on outsourcing success	As above	As above	Optional

Table 2. Case study instruments

	Questions	Sources of evidence
Social network patterns	Which cross-organizational social network patterns appear around the client-vendor interface of an outsourced project?	Project plan, process maps, ground setting and case study interviews, diaries and surveys
	How do cross-organizational social network patterns facilitate or constrain outsourced-project success?	Case study interviews
	How are the identified social network patterns	Ground setting and case study interviews

	achieved in the respective case setting?	
Outsourced-project success	What are the goals of the outsourced project?	Ground setting interview, outsourcing contract, project plan
	What is the perceived level of goal achievement?	Ground setting interview
	What is the level of operational satisfaction?	Ground setting and case study interviews
Context	What is the outsourcing arrangement's context?	Ground-setting interview, documentation of outsourcing arrangement

Table 3. Potential sources of evidence

CURRENT STATUS OF THE PROJECT

Currently, the project is in the phase of empirical inquiry of the research questions in explorative case studies. The goal is to understand the "hows" and "whys" of the suggested links between SN structures and the success of outsourced projects.

A pilot case for the analysis of SN structures is conducted with a provider of ASP services. The case includes "pilot clients" who support the service provider in development projects for further services. This case is limited to a specific setting and thus allows reducing complexity of the analysis as several context factors are controlled. The service provider grants access to a range of different clients aiming at a diverse mix of size, geography and services provided.

Two more case studies based on the presented research design are ongoing: 1) we examine the data management unit of a multinational software provider's B2B division and their relationship with an international IT services vendor. The setting is particularly interesting as we look at a globally distributed team using different interaction modes than co-located teams. 2) We analyze the collaboration between a German manufacturer and its outsourcing provider with vendor employees both working on- and off-site on a range of IT services for their client.

Further case studies are currently planned, e.g., in the German financial and logistics sector. Additionally, a provider-based approach similar to the pilot case will be followed with partners in the IT services industry offering a broader range of products (e.g. systems integration and software maintenance). Collaboration with service providers offers the opportunity to analyze various outsourcing arrangements while controlling context attributes. Also, the provider is likely to have a predefined set of formal team setups they usually use in projects, which allows for comparison of planned and actual structures.

Based on the case study results, we will detail and further explain the basic model. The case studies will show which network properties have a central role for outsourced-project success and how they originate in real life settings. This will allow us to draw conclusions on beneficial communication structures and suggest measures to successfully manage outsourced projects.

CONCLUSION AND OUTLOOK

Our research has so far shown that previous literature on outsourcing provides indications that SN structures do influence outsourced-project success. Both the structural properties of the client-vendor network and the properties of ties between individuals proved to be relevant. This motivates and guides our empirical exploration of various outsourcing arrangements. In our presentation at the 5th International Research Workshop on IT Project Management we will present case study results, covering four central topics:

- SN structures occurring in outsourced projects: We will present exemplary networks and explanations of their impact on project management in the case studies.

- Detailed model based on literature analysis and case study results: We will show a detailed version of the model proposed in figure 2, differentiating links between network properties and the two dimensions of outsourced-project success.

- Relevance of context attributes: We will present hypotheses on the interplay of context attributes and SN structures based on the case studies.

- Guidance for project leaders: We will propose a set of project management guidelines summarizing which network patterns are beneficial to successfully manage outsourced projects and how they are established.

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