DISTRIBUTED SERVICE ENGINEERING:

INTEGRATING CLIENTS IN SERVICE INNOVATION PROCESSES

Paper presented for presentation to

The 2009 Naples Forum on Services-Doctoral Workshop

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Abstract

This paper presents a summary of the author's PhD research proposal. It includes a brief review of the literature on service engineering, the theoretical underpinnings of customer involvement in service engineering projects, and the resulting research questions and anticipated methodology to be applied. The proposed research focuses on investigating distributed service engineering scenarios, where service provider and client are physically distributed, while engaging in service co-production. The research attempts to answer the question of how the interaction between service provider and client can be optimised in regard to its effectiveness and efficiency. This is attempted by applying theories that originate from research on "virtual teams", esp. the so-called "requisite connectivity"metaphor, into service research.

Keywords: Service Engineering, Connectivity, Customer Integration

Classification: Research paper

1) Introduction

The world's major economies are all based on the provision of service; however service is amongst the least studied components of those economies (Chesbrough, Spohrer 2006). Service-innovation is usually not approached as systematically as innovation in other areas, such as the manufacturing of goods, therefore the development of a "science of service", which aimed to provide theory and practice around service innovation became necessary (Spohrer et al. 2007).

Service Engineering, the research field that attempts to systematically apply methodologies and tools to the development of new service provisions, has recently made substantial advancements, yet its approaches are often similar to conventional product development and innovation. A new service is created efficiently, but usually without significant client input and integration, which is a major hindrance to the success of a new service (Faehnrich, Meiren 2007), (Naegele, Vossen 2006). The idea of client integration is also supported by the "service dominant logic" (Vargo, Lusch 2008), which perceives service as value-co-creation between providers *and* clients, rather than what "producers" create and deliver. Moeller (2008) views the integration of the client in the service engineering process, as a fundamental prerequisite for value co-creation. Another related approach by Sampson and Froehle is "unified services theory," that also emphasizes the importance of co-operation between service-provider and client during creation and delivery of service provisions. This accounts especially for highly customized and knowledge-intensive service such as consulting or software development (Sampson, Froehle 2006). Corresponding approaches related to (service) innovation are "distributed co-creation" and "co-innovation", which are particularly facilitated through internet-technologies. Companies begin to learn how to use technology to link clients into development-projects for a new service, thus gaining competitive advantages through increasingly client-oriented value propositions (Bughin et al. 2008), (Mannervik, Ramirez 2006).

Despite the sufficient underlying theoretical support for client-integration in service engineering, existing service engineering methodologies are often not applicable for the development of knowledge-intensive service provisions due to their high level of customer contact-intensity and the variety of service-offerings; both of which are not taken into account in currently existing methodologies (Faehnrich, Meiren 2007), (Bullinger, Meiren 2001).

A promising new approach is “distributed service engineering”. This emerging sub-area of “traditional” service engineering focuses on the socio-technical management and integration of physically dispersed stakeholders (e.g. global firms) that are involved in the development process. Hence, it is especially applicable for the development of knowledge-intensive service provisions, since it attempts to include all stakeholders involved (Kersten et al. 2006).

Both scenarios of “distributed service engineering” and “distributed co-creation” are structurally similar to organisational settings of distributed or “virtual” teams (Duarte, Snyder 2006). Optimizing the performance of such a distributed, co-operating workforce on multiple socio-technical levels, is defined through the “connectivity” metaphor by Kolb et al. With “requisite connectivity” as a threshold condition to optimal connectivity or “connective flow”, the authors refer to a state of “robust and reliable communication and/or transportation media/modes, (...) desired for a given task.” “Hypo” and “Hyper” connectivity, conditions with insufficient or too many communication/media modes, respectively have a negative impact on performance and should be avoided (Kolb et al. 2008), (Kolb 2008).

When stakeholders consist of both internal (service provider) and external (client) sources, rather than only the former, as originally investigated by Kolb et al., it remains unclear how connectivity can be applied in these collaborative service engineering and distributed co-creation scenarios. Service provider and client form a “virtual team” when co-producing service provisions while being physically dispersed. The question arises how to optimise the performance of that distributed workforce in regard to its efficiency and effectiveness.

The following pages present a summary of the author’s PhD proposal written at The University of Auckland Business School, for the 2009 Naples Forum on Services- Doctoral workshop. Chapter one focuses on the theoretical background of the work, and presents briefly the current state of research in service, service engineering and the related fields of distributed work, client integration and connectivity, in order to motivate the research. Chapter three further explains the aims, objectives and anticipated contribution of the PhD research, while focussing on the research design and methodology to be applied, including a preliminary timeline. Chapter four concludes the paper with a summary of the research.

2) Review of the Literature

2.1) Foundations of Service Research

The rising significance of service and the increased pace, in which markets and corporations have transformed towards a more service-oriented environment, raises the need for innovation in service (Palmisano 2006), (Maglio, Spohrer 2008). Innovation in service is still poorly understood and several challenges are present in the research community (Gadrey, Gallouj 2002). For example, Oxton (2008) points out, that innovation approaches taken from manufacturing cannot be applied within service-businesses. Unlike in manufacturing, where production and consumption of a physical entity is separated for the end-user, the inclusion of the service client in the service-development process is crucial for the success of the new service provision (Oxton 2008).

The "service system" has been proposed as a basic unit of analysis of service (Maglio, Spohrer 2008). A service system is defined as a "value co-creation configurations of people, technology and value propositions connecting internal and external service systems, and shared information (language, laws, measures and methods)" (Maglio, Spohrer 2008).

With the introduction of the "Service Dominant Logic" (Vargo, Lusch 2004), a novel perspective on service (singular) has been introduced, and is perceived as a "philosophical foundation of service science" (Maglio, Spohrer 2008). Here, service is understood as the "application of competencies (knowledge and skills) for the benefit of another party", and also considered as the primary focus of all economic exchange (Vargo, Lusch 2004), (Vargo, Lusch 2006).

Within the service dominant logic, value creation moves away from a "producer" or "firm", towards a collaborative process where service and value are co-created amongst the service provider and beneficiary in exchange for another service (Vargo, Lusch 2004), (Vargo, Lusch 2006). Other authors have a comparable understanding of economic exchange. Gronroos (2006) and Normann (2001) refer to a "service logic", while Edvardsson et al (2007) support the logic through their "service perspective". Gummesson's (2008) view is that the traditional understanding of "goods" and "services" in traditional economics, is not applicable anymore, and a new mindset based on value co-creation is necessary to advance our knowledge and understanding in the field of service research.

2.2) Service Engineering

Despite the obvious relevance of innovation in service-businesses, Luczak et al. (2007) state that appropriate knowledge on effective and efficient service development is still marginal. The lack of knowledge about suitable systematic development methodologies leads to service-development approaches in an "ad-hoc" fashion. Ineffective and low quality service provisions that do not meet the demands of the market are the outcome (Faehnrich, Meiren 2007), leading to a majority of newly developed service provisions failing shortly after being introduced into the marketplace (Bullinger, Scheer 2006).

Hence, the systematic development of service provisions is perceived as a central success-factor, resulting in reduced development-costs, increased service quality and decreased time-to-market (Bullinger, Scheer 2006). Consequently, several attempts have been made to systematically approach the development of new service provisions.

Service Engineering is an interdisciplinary (Bullinger, Scheer 2006), scientific discipline that attempts to systematically develop business-to-business service provisions (Spath et al. 2007). Appropriate engineering principles, methodologies and tools (Mandelbaum, Zeltyn 2007) form the central part of that approach, and it has been suggested, that service engineering should be established as a functional area within a corporation in order to maximise efficiency (Luczak et al. 2007). Edvardsson et al. (2002) also support that idea, and state that service engineering should encompass not only the actual development of a new service provision, but also related corporate functionalities such as corporate culture, strategy and policies.

Luczak et al. (2007) state that recent approaches in service engineering to develop methodologies intended to systematically support the development of new service provisions, always assume that a service can be created from scratch like a physical good (Scheuing, Johnson 1989), (Shostack 1984), (Ramaswamy 1996) amongst several others.[1] This "Goods Dominant Logic" (Vargo, Lusch 2004) perception, leads to a major problem that service companies face today: existing methodologies for service development are not suitable for the creation of complex knowledge-intensive service provisions, due to the fact that they often negate the inclusion of the client in the development process (Spath et al. 2007), (Faehnrich et al. 1999). That is a major problem, since the inclusion of the client in the

[1] For an overview of engineering methodologies see Schneider, Daun (2006).

development process is, in particular for these service provisions, perceived as crucial for success (see chapter 2.3). A sub-area of established service engineering, which tries to attempt the issue of integration, is collaborative or "distributed service engineering".

Distributed Service Engineering (DSE) is a special conception of traditional service engineering. It utilises information and communication technologies in order to integrate all stakeholders involved in the service engineering process. Characteristic is the physical distribution of all co-operating stakeholders during each phase of the service development (Kersten et al. 2006).

2.3) Client Involvement in Service Engineering

Besides the methodological and systematic development of new service provisions, the integration of the client, not only in the service performance itself, but especially in pre-transactional phases such as the service engineering, is considered to be one of the most important factors for a company wanting to successfully develop and introduce a new service in a market (Reckenfeldbaeumer, Busse 2006), (Naegele, Vossen 2006), (Edvardsson et al. 2007), (Frauendorf 2006), (Moeller 2008). Prahalad and Ramaswamy (2004) also emphasise the importance of co-creating unique value in conjunction with service-clients. Companies should develop a deep and thorough understanding of their clients and what creates value for them. This is best achieved through the creation of a client-centric service culture within a company, an approach that fits to the functional perception of service engineering that Edvardsson et al. (2002), as well as Klein (2006) suggest. Edvardsson et al. (2006) refer in that context to a "service perspective", with the intention to align the business activities in conjunction with the client's perspective on value creation whilst experiencing the service.

Client involvement in service engineering is generally motivated by a set of holistic factors. Those range from a general desire to differentiate oneself from competitors, including the resulting prospects of charging a price premium (Mannervik, Ramirez 2006), to the avoidance of service failure in the market (Alam 2006). Mannervik and Ramirez (2006) also mention increased perceived customer loyalty being a potential motivational factor, while Naegele (2006) emphasises the fact that the developed service tends to be more focused on client's needs, when they are integrated into the respective processes.

Mannervik and Ramirez (2006) examine client integration in service engineering from a strategic perspective, referring to *co-innovation* instead of *integration*. Their work implies a

shift towards the extensive re-distribution of traditional company roles, which have been influenced by advances in information technology that can help to connect client and service provider. Mannervik and Ramirez (2006) also recognize that value co-creation has existed previously, however the extent to which this phenomenon is now understood and the technological possibilities that exist to re-arrange resources are new

2.4) The Role of Connectivity in Service Engineering

The use of information and communication technologies such as email, mobile phones, fax or videoconferencing, is an essential part of conducting business in the 21st century and plays a fundamental role in service businesses (Murphy 2007), (Froehle 2006). Despite the variety of technologies available, individuals want to be *connected* to their colleagues or customers. Hence "connectivity" arose as the underlying metaphor to describe individual's usage of information technology (Kolb 2008). The term connectivity has been used in the past to describe non-technical characteristics of human interaction (Cartwright 2002), (Kanter 1999), (Tomlinson 1999), (Wellmann 2001), but also within research about mergers and acquisitions (Schweiger, Goulet 2005) or the use of expatriates (Hebert et al. 2005), and is now applied in the context of intra- and inter-organisational interactions (Kolb 2008). Therefore, it appears to be useful whilst examining the interaction between service provider and client in a distributed service engineering scenario.

Kolb et al. (2008a) have raised the question of whether or not organisations and individuals can experience "too much" connectivity, and how much of it is sufficient to maintain effectiveness without being overburdened. Angwin and Vaara (2005, p. 1445) perceive connectivity as a metaphor that "highlights the complexities, interconnected processes and synchronized activities in organisations and their contexts". Kolb et al. (2008, p. 128) define connectivity as the "mechanisms, processes, systems and relationships that link individuals and collectives (e.g. groups, organisations, cultures, societies) by facilitating material, informational and/or social exchange." According to the authors, it encompasses "geo-physical (e.g. space, time and location), technological (e.g. information technology and their applications) as well as social interactions and artefacts, including shared histories, travel, trade, migration, culture, politics and other social activities."

Kolb et al. (2008), (2008a) apply the connectivity metaphor on organisational settings such as distributed work teams, in order to gain a new perspective on efficient and effective interaction among social actors in such a scenario. The authors argue that actors do not seek increasing amounts of connectivity, but rather aim for a threshold condition that is appropriate for their intended purpose, and does not undermine individual performance by means of wasted time, the creation of anxiety, stress or the invasion of personal space. They refer to it as "requisite connectivity" and define it as the "state of having robust and reliable communication and/or transportation media/modes, with operable alternative work around options, so that contact may be initiated or maintained at the rate, richness and intensity required for a given task or social outcome" (Kolb et al. 2008a, p. 185).

While requisite connectivity is desirable, too little connectivity can be an issue within an organisation. Kolb et al. (2008a, p. 185) call this condition "hypo-connectivity" and describe it as "not having sufficient connections for the task or job at hand". Technical issues such as weak internet connections, insufficient mobile phone reception, or limited travel options between subsidiaries or members of distributed teams can be viewed as "hypo-connectivity". Other aspects can include a lack in social capital or cross-cultural understanding (Kolb et al. 2008a).

The other extreme of being connected is a condition where actors are overburdened due to the increasing amount of the connectivity that they experience. Certain tasks in any team-setting require strong mental efforts of the individual, during which intense connectivity can lead to inefficiencies. Information overload, attention demanding workflows and disturbances all have a negative impact on the results of the social actors in a team. Whenever too much connectivity is the rule, for instance through pervasive and ubiquitous technologies such as mobile phones and email (blackberry), Kolb et al. (2008a) suggest a state of "hyper-connectivity". While hyper-connectivity does not necessarily negatively impact performance in every scenario, it can reach a point where connectivity becomes detrimental to the work environment. Here, the team or its individual actors witness an excess of connectivity through an information overload, invasive connective media or constant social contact which undermines efficiency (Kolb et al. 2008a).

Figure 1 shows the interrelation of connectivity and team-performance.

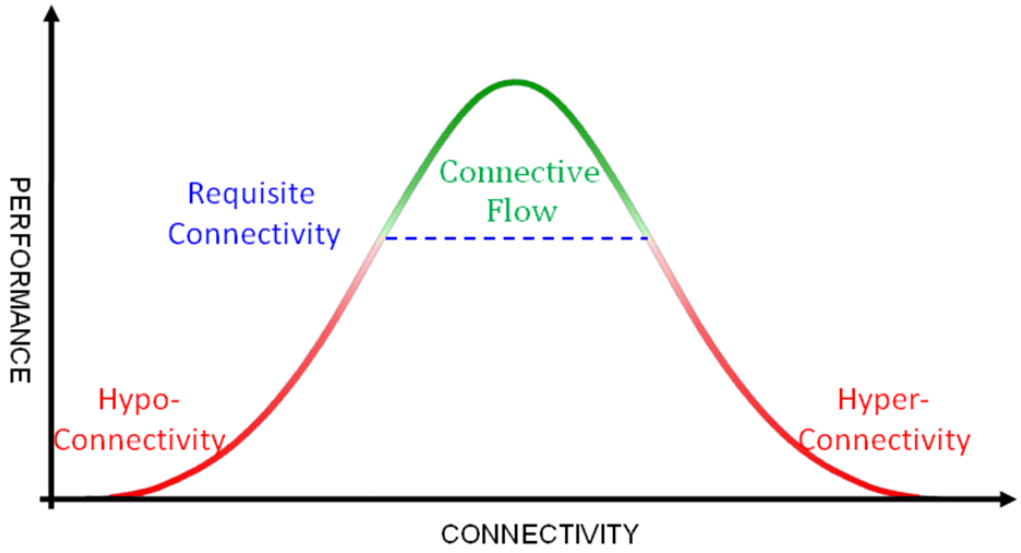

Figure 1: Connectivity and Team-Performance (Kolb et al. 2008).

Kolb et al. (2008) suggest that distributed teams should attempt to achieve requisite connectivity as a threshold condition, whilst avoiding hyper-connectivity in order to maintain a high rate of productivity for their tasks and processes. Requisite connectivity could then be experienced as so called "connective flow" where "communication is highly effective and highly efficient, and balanced in accordance with our needs and the demands of the task or situation at hand" (Kolb et al. 2008, p. 3). The authors further suggest that in organisational contexts, technology, tasks and individual team characteristics need to be aligned towards common needs or purposes, so that requisite connectivity as a threshold can initially be reached (Kolb et al. 2008).

3) Methodology

3.1 Research Questions

The overall-goal of this PhD-research is, to analyse the engineering and delivery processes of knowledge-intensive service provisions in professional service (consulting) firms and their clients. The research will particularly investigate the means that enable these service providers to integrate their physically dispersed clients in the engineering and delivery of the proposed new service. Especially the impact of existing socio-technical connections between the provider and client, embodied through "requisite connectivity", and the effects of this on the efficiency and effectiveness of the service engineering and delivery processes will be examined. These goals are pursued through the following research questions:

- *Research question 1*: How can the concept of requisite connectivity be applied in a distributed service engineering scenario, where stakeholders consist of internal (service provider) and external (client/collaborator) sources, rather than only the former as originally investigated by Kolb et al., in order to improve the efficiency and effectiveness of the service engineering and delivery processes?

- *Research question 2*: What are the types and level of connectivity necessary to successfully integrate clients in distributed service engineering and delivery processes?

- *Research question 3*: What are the ideal means service providers can use to integrate their clients and potential third party collaborators in distributed service engineering and delivery processes?

Professional service firms and, in particular, the consulting industry are characteristically ideal to answer these questions within the study. Consulting is a highly knowledge-intensive service, where client input is vital (Maglio, Spohrer 2008), (Miles 2003). Faehnrich and Meiren (2007) characterized the necessity for client input as "high customer contact intensity" and emphasized the importance of that characteristic for the success of knowledge-intensive service provisions.

The research questions will be investigated from a perspective utilising the "service system" framework (Gadrey, Galloj 2002). This framework consists of three main components

"service provider", "service client" and "service target" that form the "service system". Figure 2 illustrates their interrelation:

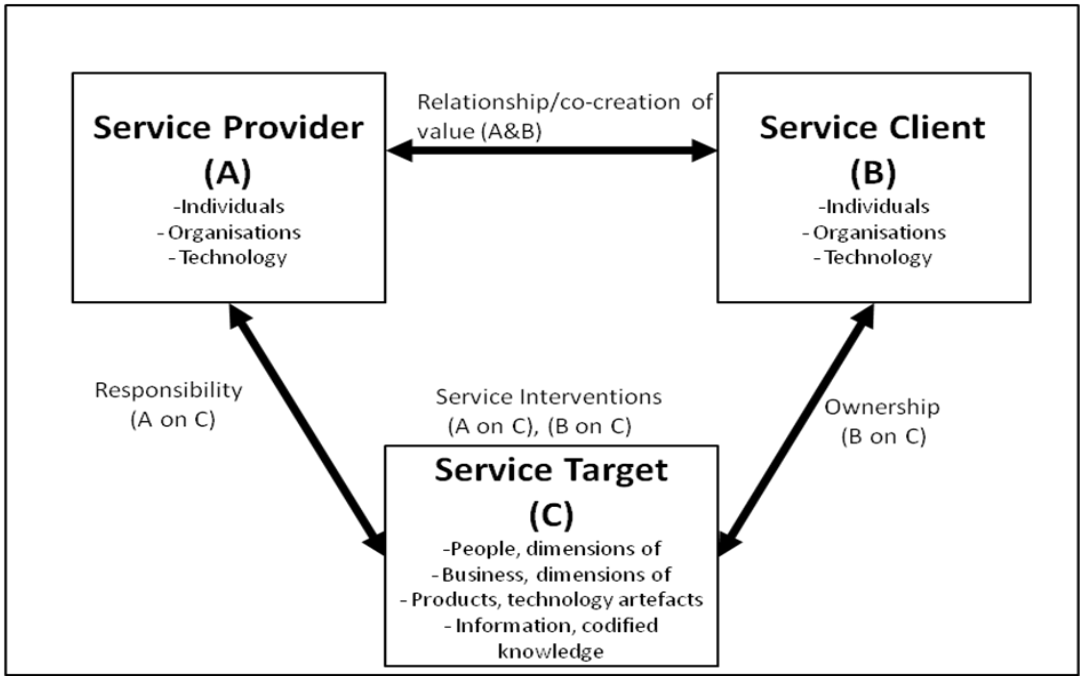

Figure 2: Service System Framework according to Gadrey, Galloj 2002.

The "service provider" can consist of one entity or a combination of individuals, technology and organisations that share responsibility for the "service target", which is understood as a "reality to be transformed or operated on by the service provider for the sake of the service client" (Gadrey, Galloj 2002). The "service client" can also consist of a single entity or a combination of individuals or organisations, and co-creates value for itself in conjunction with the "service provider".

3.2 Working Hypothesis

The underlying assumption of this research is that a distributed service engineering scenario can be perceived as special case of an organisational setting similar to "virtual teams" or "distributed workgroups", that interact via socio-technical systems (Froehle 2006), (Appelbaum 1997).

As stated by Frauendorf (2006), the comprehensive service process, i.e. the interactions within a service system (Gadrey, Galloj 2002), are a combination of technical components, service provider components and service client components. While technical components consist of machines, IT or communication tools, the service provider components are

activities carried out by the provider that can be supported by means of technology. The service client component or "client process" involves those activities that are carried out either by, or with the help of the client (Frauendorf 2006). The use and application of information technology within the service system appears to be crucial for its success and a general prerequisite for interaction between service provider and client, especially when developing and delivering knowledge-intensive services. Hence, the comprehensive service process can be understood as a socio-technical system (Appelbaum 1997).

Socio-technical systems are complex organisational work designs, which "recognize the interaction between people and technology in workplaces" (Trist et al. 1963). Their design is based on the premise that organisations or work units are a "combination of social and technical parts" (Trist et al. 1963). Appelbaum emphasises that the key issue for the successful use of a socio-technical system lies in the design, where "joint optimization" is meant to integrate both social and technical elements (Appelbaum 1997).

Based on the understanding of socio-technical systems by Appelbaum (1997), the comprehensive service process as outlined by Frauendorf (2006), can be understood as a socio-technical system where machines, IT or communication tools used by either service provider or client, form the "technical" component. The interaction between the service provider and client represents the social interaction that is evident in socio-technical systems (Appelbaum 1997), (Frauendorf 2006). Therefore, the concepts and ideas originating from the literature and research on socio-technical systems or distributed work-environments seem to be applicable in distributed service engineering.

Kolb et al. demonstrated the performance of physically distributed socio-technical systems such as "virtual" or distributed teams is correlated to their degree of "connectivity" (Kolb et al. 2008). While "requisite connectivity" can be considered as a threshold condition, "connective flow" represents the ideal amount and quality of socio-technical connections within a virtual team that positively influences its task efficiency and effectiveness (see chapter 2.4) (Kolb et al. 2008), (Kolb 2008).

Since teams that develop and deliver new service provisions in a distributed context utilise technology to communicate and interact with their peers for a given project or task (Gibson,

Cohan 2003), they appear to be especially applicable for the concept of "connectivity". The main working hypothesis of this research project is based on the assumption that:

A state of "connective flow" between the service provider and client, will improve the pre-defined outcome of the service target.

Hence, it becomes necessary for service provider to understand how to create a state of requisite connectivity within their service teams from scratch, in order to improve the interaction with their clients. Ideally, this will then result in competitive advantages such as increased client satisfaction, reduced communication cost and time savings during the creation and delivery of the proposed service.

3.3 Contribution and Outcome

This PhD study attempts to contribute knowledge particularly to the fields of service engineering and distributed work environments. Knowledge gained from the study could potentially support the development of a methodology or management tool that could help service providers, esp. consulting firms, to successfully integrate their physically distributed clients into the engineering and delivery processes of knowledge intensive service provisions. The anticipated contribution of the individual research questions is the following:

Research Question 1: Kolb et al. (2008) investigated and explained requisite connectivity and connective flow within an *inter*-organizational context, and focussed on its impact on single team performance. This study however, will focus on the investigation of connectivity within an *intra*-organisational context, that includes the entire service system framework (Gadrey, Galloj 2002) and thus attempts to link connectivity to the service target and value co-creation between provider and client. Furthermore, instead of conducting research within a variety of organisations and industries, the research will be centred on knowledge-intensive service providers, particularly consulting firms. This research question aims at exploring how the idea of requisite connectivity/connective flow can be used to improve the success of distributed service engineering and delivery processes.

Research Question 2: Kolb et al. defined three level of connectivity: Hypo, hyper and requisite connectivity, embodied through technical and social connectivity (Kolb et al. 2008). However, it is unclear what types and level of connectivity matter in a distributed service

engineering scenario. Is social connectivity more important than technical connectivity? Are there other factors, such as organisational or legal issues that influence the success of service development projects? What are the existing best-practice approaches within the cases? Ideally, the research question will help to explain what requisite connectivity in the consulting industry means and how it can be created from scratch.

Research Question 3: This research question concludes and summarizes the results from the previous research questions. Ideally, the study will be able to explain what the optimum socio-technical client-integration approach for a service provider embodies. The researcher expects that this would imply the creation of a state of requisite connectivity "from scratch". Another conclusion that could possibly be drawn from that scenario is that requisite connectivity/connective flow actually improves the pre-defined service outcome. This would support Kolb et al (2008), and their findings linking team productivity and connectivity.

3.4 Methodology and Research Design

The study will be conducted using a multiple case study approach. Case studies present an opportunity to "investigate a contemporary phenomenon within its real-life context" (Yin 2003). They enable the researcher to understand current incidents while explicitly considering their contextual conditions (Yin 2003). Furthermore, multiple sources of evidence can be used within the context of a case study, including interviews, surveys or the analysis of additional documents (Yin 1993). The option of using either quantitative, qualitative or a mixture of both approaches seems ideal for the research area of distributed service engineering, since only a very small amount of literature exists on the topic.

All data shall be collected from case sites that represent the service system framework by Gadrey and Galloj (2002), consisting of service provider, service client and a service target. Projects that are relevant for the research include service development and delivery activities that explicitly include the client organisation in the process, and the physical distribution of service provider and client. Hence, data can be collected from a provider and client perspective, which further enriches the understanding of distributed engineering scenarios.

The study will be carried out in a multiple-case study setting in the consulting industry, where each service system will be considered as a single case (Yin 2003). The advantages of a multiple-case study include a deeper understanding of the phenomenon in general (Miles,

Haberman 1994) and more robust and testable theory (Eisenhardt, Graebner 2007). Also, the opportunity to deliberately choose cases which embody certain characteristics that might lead to a better understanding and theorizing about an even larger collection of cases is considered to be yet another advantage (Stake 2000).

For the initial pilot-study, interviews with project-members of distributed service engineering projects will be conducted. These project members will most likely consist of (senior) project managers and employees from, both the service provider and client organisation. The pilot-study will be conducted in New Zealand and all interviews will be on a voluntary basis. The researcher aims to use the snowball system to select potential interviewees. The total number of individuals will depend on the willingness of the individuals and organisations to participate, as well on the suggestion of organizations and former interviewees. The pilot study is designed to identify the key-issues in distributed service engineering and will therefore enable the researcher to refine the research question as well as the questionnaire used in the main study.

The main study will be conducted in consulting firms in New Zealand, with further research including other countries, should the opportunity arise. Possible scenarios include a “one company, multiple site”, where each site with their associated clients represents a case, or “multi company” study, with each company contributing with their clients and projects as cases.

Table 1 summarizes the tasks of the pilot phase and main study.

Research Phase	Objectives	Methods
PHASE I: *Pilot Study* April - August 2009 Auckland, NZ	-Understanding of client expectations and provider behaviour in distributed service engineering scenarios -Identification of deficiencies in distributed service engineering scenarios -Establishment of contacts to industry partners for main study -Refinement of questionnaire and survey	-Interview representatives of service provider and clients within each case -Presentation of research proposal to potential industry partner
PHASE II: *Main Study* *September 2009 - February 2010* *Auckland, NZ*	-Full data collection and evaluation -Data analysis -Written draft of thesis	-Quantitative survey will be based on results from phase 1 and literature review - Phase 1 will provide the researcher with sufficient industry-contacts to conduct main survey

Table 1: Overview of Research Phase I and II.

Using the data from the main study, the research questions can be answered and the researcher will be able to assess the potential of requisite connectivity/connective flow for distributed service engineering scenarios. Further steps in the research could include the development of a methodology that explicitly guides service providers in the inclusion of their clients in the development and delivery of their services to physically distributed clients.

4) Discussion and Conclusions

Distributed Service Engineering, an emerging sub-area of “traditional” service engineering, focuses on the socio-technical management and integration of physically distributed stakeholders involved in the process, and is especially applicable for knowledge-intensive service provisions. Its scenarios are similar to organisational settings like distributed or “virtual” teams, where, in order to optimize efficiency and effectiveness, “connective flow” is defined as a necessary condition. However, it remains unclear how connectivity can be applied in a distributed service engineering scenario, where stakeholders consist of both internal (service provider) and external (client) sources rather than only the former. This paper outlined ongoing PhD research that investigates the potential of connectivity to improve the engineering of knowledge intensive service processes.

5) References

Alam, I. (2006): "Process of Customer Interaction in New Service Development", Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P., Mathing, J. (eds.) *Involving Customers in New Service Development*. Imperial College Press, London, UK, pp. 15-33.

Angwin, D., Vaara, E. (2005): "Introduction to Special Issue on Connectivity in Merging Organizations: Beyond Traditional Cultural Perspectives", *Organisation Studies* Vol.26, No. 10, pp. 1445-1453.

Appelbaum, S. H. (1997): "Socio-technical Systems Theory: An Intervention strategy For Organisational Development", *Management Decisions,* Vol. 35, No. 6, pp. 452-263.

Bughin, J., Chui, M., Johnson, B. (2008): "The Next Step in Open Innovation", *The McKinsey Quarterly*, June, pp. 1-8.

Bullinger, H., Meiren, T. (2001): "Service Engineering", Bruhn, M., Meffert, H. (eds.) *Handbuch Dienstleistungsmanagement. Von der strategischen Konzeptions zur Praktischen Umsetzung*, Gabler, Wiesbaden, pp. 149-175.

Bullinger, H., Scheer, A-W. (2006): „Service Engineering: Entwicklung und Gestaltung Innovativer Dienstleistungen", Bullinger, H., Scheer, A-W. (eds.) *Service Engineering* 2nd ed. Springer, Berlin, GER, pp. 3-18.

Cartwright, P. A. (2002): "Only Converge: Networks and Connectivity in the Information Economy", *Business Strategy Review*, Vol. 13, No. 2, pp. 59-64.

Chesbrough, H., Spohrer, J. (2006): "A Research Manifesto for Services Science", *Communications of the ACM*, Vol. 49, No. 7, pp. 35-40.

Duarte, D. L., Snyder, N. T. (2006): *Mastering Virtual Teams: Strategies, Tools and Techniques that Succeed*, 3rd Edition, Wiley, San Francisco, USA.

Edvardsson, B., Gustafsson, A., Enquist, B. (2007): "Success Factors in New Service Development and Value Creation through Services", Spath, D., Faehnrich, K. (eds.) *Advances in Services Innovations*. Springer, Berlin, GER, pp.48-62.

Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P., Mathing, J. (2006): "Introduction", in: Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P., Mathing, J. (eds.) *Involving Customers in New Service Development*. Imperial College Press, London, UK, pp. 1-15.

Edvardsson, B., Gustafsson, A., Johnson, M. D., Sanden, B. (2002): *New Service Development and Innovation in the New Economy*. Studentliteratur, Lund, SE.

Eisenhardt, K. M., Graebner, M. E. (2007): "Theory Building from Cases: Opportunities and Challenges", *Academy of Management Journal*, Vol. 50, No 1. pp. 25-32.

Faehnrich, K., Meiren T. (2007): “Service Engineering: State of the Art and Future Trends”, Spath, D., Faehnrich, K. (eds.): *Advances in Services Innovation*, Springer, Berlin, pp. 4-14.

Faehnrich, K., Meiren, T., Barth T., Hertweck A., Baumeister M., Demuss L., Gaiser, B., Zerr K. (1999): *Service Engineering. Ergebnisse einer empirischen Studie zum Stand der Dienstleistungsentwicklung in Deutschland*. Stuttgart, GER.

Frauendorf, J. (2006): *Customer Processes in Business to Business Service Transactions*, Gabler, Wiesbaden, GER.

Froehle, C. M. (2006): “Service Personnel, Technology, and their Interaction in Influencing Customer Satisfaction”, *Decision Sciences,* 37, 1, pp. 5-38.

Gadrey, J., Gallouj, F. (eds.) (2002): *Productivity, Innovation and Knowledge in Services: New Economic and Socio Economic Approaches*. Edward Elgar, Cheltenham, UK.

Gibson, C. B., Cohan, S. G. (eds.) (2003): *Virtual Teams That Work.* San Francisco, USA.

Gronroos, C. (2006): “What Can Service Logic Offer Marketing Theory”, in: R. F. Lusch S. L. Vargo (eds) *The Service-Dominant Logic of Marketing: Dialog, Debate, and Directions*. Sharpe, Armonk, USA, pp. 354-364.

Gummesson, E. (2008): “Quality, Service-Dominant Logic and Many-to-Many Marketing”, *The TQM Journal, Vol.* 20, No 2, pp. 143-153.

Hebert, L., Very, P., Beamish, P. W. (2005): “Expatriation as a Bridge Over Troubled Water: A Knowledge-Based Perspective Applied To Cross-Border Acquisitions”, *Organisation Studies* Vol. 26, No. 10, pp. 1455-1476.

Kanter, R. M. (1999): “Change is Everyone’s Job: Managing the Extended Enterprise in A Globally Connected World”, *Organisational Dynamics* Vol. 28, No. 1, pp. 7-23.

Kersten, W., Kern, E., Zink, T. (2006): “Collaborative Service Engineering”, Bullinger, H., Scheer, A. (eds.) *Service Engineering,* Berlin, GER, pp. 341-356.

Klein, R. (2006): *Modellgestuetztes Service Systems Engineering*, DUV, Saarbruecken, GER.

Kolb, D., Collins, P. Lind, A. (2008): “Requisite Connectivity- Finding Flow in a not so Flat world”, *Organisational Dynamics,* Vol. 37, No. 2, pp. 181-189.

Kolb, D. (2008): “Exploring the Metaphor of Connectivity: Attributes, Dimensions and Duality”, *Organisation Studies*, Vol. 29, No.1 , pp. 127-144.

Kolb, D., Collins, P., Lind, A. (2008a): In Search of Requisite Connectivity, *Organisational Dynamics,* Vol. 27, No. 2, pp. 181-189;

Luczak, H., Gill, C., Sander, B. (2007): "Architecture for Service Engineering: The Design And Development of Industrial Service Work", Spath, D., Faehnrich, K. (eds.) *Advances in Services Innovations*. Springer, Berlin, GER, pp.48-62.

Maglio, P. P., Spohrer, J. (2008): „Fundamentals of Service Science". *Journal of the Academy of Marketing Science*, Vol. 36, pp. 18-20.

Mannervik, U., Ramirez, R. (2006): "Customers as Co-Innovators: An Initial Exploration Of Its Strategic Importance", Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P., Mathing, J. (eds.) *Involving Customers in New Service Development*. Imperial College Press, London, UK, pp. 57-77.

Mandelbaum, A., Zeltyn, S. (2007): "Service Engineering in Action: The Palm/Erlang-A Queue with Applications to Call Centers", Spath, D., Faehnrich, K. (eds.) *Advances in Services Innovations*. Springer, Berlin, GER, pp. 18-44.

Mannervik, U., Ramirez, R. (2006): "Customers as Co-Innovators: An Initial Exploration Of Its Strategic Importance", Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P., Mathing, J. (eds.) *Involving Customers in New Service Development*. Imperial College Press, London, UK, pp. 57-77.

Miles, M. B., Haberman, A. M. (1994): *An Expanded Sourcebook: Qualitative Data Analysis* 2nd edition. Sage, London, UK.

Miles, I. (2003): "Services and the Knowledge-Based Economy", Tidd, J., Hull, F. M. (eds.) *Service Innovation*. Imperial College Press, London, UK, pp. 81-112.

Moeller, S. (2008): "Customer Integration A Key to an Implementation Perspective of Service Provision", *Journal of Service Research*, Vol. 11, No. 2, pp. 197-210.

Murphy, P. (2007): *You Are Wasting My Time: Why Limits on Connectivity are Essential For Economies of Creativity*. Accessed online at: www.petermurphyweb.net/ Publications/*Peter_Murphy_Wasting_Time_2007.pdf.*

Naegele, R. (2006): "Customer-Oriented Service Engineering: Findings of Case Studies Of Customer Integration in the Service Development Process", Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P., Mathing, J. (eds.) *Involving Customers in New Service Development*. Imperial College Press, London, UK, pp. 249-269.

Naegele, R., Vossen, I. (2006): „Erfolgsfaktor kundenorientiertes Service Engineering: Fallstudienergebnisse zum Tertiarisierungsprozess und zur Integration des Kunden in die Dienstleistungsentwicklung", Bullinger, H., Scheer, A-W. (eds.) *Service Engineering* 2nd ed. Springer, Berlin, GER, pp. 521-545.

Normann, R. (2001): *Reframing Business: When the map changes the landscape*. Wiley, New York, US.

Oxton, G. (2008): "An Integrated Approach to Service Innovation, Consortium for Service Innovation". Available online at http://www.almaden.ibm.com/asr/summit/ /papers/csioxton.pdf [Accessed 08.11.2008].

Palmisano, S. J. (2006): "The Globally Integrated Enterprise", *Foreign Affairs* Vol. 85, No. 3, pp. 127-136.

Prahalad, C., Ramaswamy, V. (2004): *The Future of Competition: Co-Creating Unique Value with Customers*. HBS Publishing, Boston, US.

Ramaswamy, R. (1996): *Design and Management of Service Processes*. Reading (Mass.), US.

Reckenfeldbaeumer, M., Busse, D. (2006): „Kundenmitwirkung bei der Entwicklung Industrieller Dienstleistungen: Eine phasenbezogene Analyse", Bullinger, H., Scheer, A-W. (eds.) *Service Engineering* 2nd ed. Springer, Berlin, GER, pp. 141-166.

Sampson, S. E., Froehle, C. M. (2006): "Foundations and Implications of a Proposed Unified Services Theory", *Production and Operations Management*, Vol. 15, No. 2, pp. 320-343.

Scheuing, E. E., Johnson, E. M. (1989): "A Proposed Model for New Service Development", *The Journal of Services Marketing* Vol. 3, No. 2, pp. 25-34.

Schneider, K., Daun, C. (2006): „Vorgehensmodelle und Standards zur systematischen Entwicklung von Dienstleistungen" Bullinger, H., Scheer, A-W. (eds.) *Service Engineering* 2nd ed. Springer, Berlin, GER, pp. 113-138.

Schweiger, D., Goulet, P. (2005): "Facilitating Acquisition Integration Through Deep-Level Cultural Learning Interventions: A Longitudinal Field Experiment" *Organisation Studies* Vol. 26, No. 10, pp. 1477-1499.

Shostack, G. L. (1984): "Designing Services that Deliver", Harvard Business Review Vol. 62 No 1, pp. 133-139.

Spath, D., van Husen, C., Meyer, K., Elze, R. (2007): "Integrated Development of Software And Service: The Challenges of IT-Enabled Service Products", Spath, D., Faehnrich, K. (eds.) *Advances in Services Innovations*. Springer, Berlin, GER, pp. 86-109.

Spohrer, J., Anderson, L. C., Pass, N. J., Gruhl, D. (2007): "Service Science", *Journal of Grid Computing*, Vol. 6, No. 3. pp. 313-324.

Stake, R. E. (2000): "Case Studies", Denzin, N. K., Lincoln, Y. S. (eds.): *Handbook of Qualitative Research* 2nd edition, pp. 435-454. Sage, London, UK.

Tomlinson, J. (1999): *Globalization And Culture*. Blackwell, Chicago, USA.

Trist, E., Higgin, B., Murray, J., Pollack, A. (1963): *Organizational Choice*. Sage, London, UK.

Vargo, S., Lusch, R. F. (2008): "From Goods to Service(s): Divergences and Convergences of Logic", *Industrial Marketing Management,* Vol. 37, No. 3, pp. 254-259.

Vargo, S. L., Lusch, R. F. (2006): "Service-Dominant Logic: What It Is, What It Is Not, What it Might Be", Lusch, R. F., Vargo, S. L. (eds) *The Service-Dominant Logic Of Marketing: Dialog, Debate and Directions,* Armonk, US, pp. 1-10.

Vargo, S. L., Lusch, R. F. (2004): "Evolving to a New Dominant Logic for Marketing", *Journal of Marketing,* Vol. 68, No. 1, pp. 1-17.

Wellmann, B. (2001): "Physical Place and Cyberplace: The Rise of Personalised Networking", *International Journal of Urban and Regional Research* Vol. 25, No. 2 pp. 227-252.

Yin, R. K. (2003): "Case Study Research: Design and Methods", 3rd edition, in: *Applied Social Research Methods Series,* Vol. 5., Sage, London, UK.

Yin, R. K. (1993): "Applications of Case Study Research", in: *Applied Social Research Methods Series,* Vol. 34., Sage, London, UK.