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A CAPABILITY FRAMEWORK FOR IT SERVICE INTEGRATION AND MANAGEMENT IN MULTI-SOURCING

Complete Research

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Abstract

Multi-sourcing, the blending of services from multiple external and internal providers, has gradually become the standard mode of operation in IT outsourcing. It allows companies to assemble a best-of-breed provider portfolio and to reduce costs. A key difference between single- and multi-sourcing is the potential interdependence between services delivered by multiple providers. To deliver a seamless service to the client's business units, various services often need to be integrated and managed as an end-to-end service. This activity is denoted as service integration and management. Many clients, however, are having difficulties implementing and performing this important task. Therefore, we explore which IT capabilities organizations need to build for performing service integration and management.

After deriving challenges from literature, we perform a multi-stage qualitative study based on a series of focus group sessions and expert interviews. In a qualitative content analysis, we develop a framework of IT capabilities, which enable successful service integration and management by addressing the key challenges. We, thus, aim to contribute to more effective multi-sourcing solutions in practice and to lay the groundwork for future research in this important field.

Keywords: Service Integration and Management, Service Integration, Multi-sourcing, IT Service Management, IT Outsourcing

1 Introduction

IT outsourcing is an established strategy to focus on core competencies. In recent years, clients have been increasingly applying multi-sourcing to further improve quality and cost (Cohen and Young, 2006; Wiener and Saunders, 2014a). Likewise, research is refocusing on multi-sourcing environments with interdependent services. An emerging concept in this area is service integration and management – also simply denoted as service integration (Davy, 2014; Goldberg et al., 2014a). It aims at seamlessly integrating interdependent services from various internal and external service providers (Anderson and Parker, 2013; Bapna et al., 2010; Schermann et al., 2006). In this paper, we develop a framework of IT capabilities for organizations to effectively perform service integration and management. Due to the continuous shift towards multi-sourcing, building these capabilities will become even more crucial in the future.

As various providers increasingly deliver interdependent services, the service landscapes of clients are becoming more complex (Arora et al., 2013). This is introducing new challenges for clients who struggle to manage multiple providers (Unterharnscheidt and Kieninger, 2010) and need to integrate

the individual parts into end-to-end services (Bapna et al., 2010; Jin et al., 2014; Plugge and Janssen, 2014). While a systematic and comprehensive collection of service integration and management challenges does not exist, several research papers on multi-sourcing as well as service integration and management discuss specific challenges. Extant research does not give enough guidance, however, on how to establish service integration and management capabilities to address these specific challenges (Anderson and Parker, 2013; Bapna et al., 2010; Goldberg et al., 2014a). Existing IT capability frameworks fall short in capturing cross-provider integration in multi-sourcing. In accordance, Gartner reports that only very few companies have the capabilities to perform service integration and management (Longwood and Heiden, 2012). We intend to address this research gap by investigating the following research question:

Which IT capabilities enable organizations to address the relevant challenges of service integration and management in the context of multi-sourcing with interdependent services?

We aim to answer this question based on an explorative study. In a systematic analysis of extant literature, we capture the state of the art, and extract service integration and management challenges. On this basis, we carry out a sequence of focus group sessions and interviews with service integration experts. In a qualitative content analysis, we extract important IT capabilities from the data collected, and develop our capability framework.

Our work complements existing knowledge by providing an IT capability framework for service integration and management. It provides a base for targeted future research with regard to this key topic. Multi-sourcing organizations should be able to more effectively assess and build their service integration and management capabilities based on our framework. It should support successful service integration and management by addressing the specific challenges.

In section 2, we introduce related research work, before section 3 will outline our research approach. Then, we proceed to present the results of our qualitative content analysis: We first introduce important challenges of service integration and management in section 4, before section 5 presents our IT capability framework. In section 6, we analyze the mapping between challenges and capabilities. The paper concludes with a summary of key findings, a research outlook, a discussion of limitations as well as managerial implications.

2 Related Work

Academic research has paid little attention to IT capabilities for service integration and management in the area of *multi-sourcing with interdependent services* (Anderson and Parker, 2013; Bapna et al., 2010; Goldberg et al., 2014a; Urbach and Würz, 2012). Literature, however, does provide a collection of related work on service integration and management, its challenges and IT capabilities *in general*, that we introduce and discuss in the following.

2.1 Related Work on Service Integration and Management

Service integration and management is concerned with managing various internal and external service providers. It manages the seamless integration of their interdependent services and service components into end-to-end services in order to meet business requirements (Anderson and Parker, 2013; Bapna et al., 2010; Goldberg et al., 2014a; Schermann et al., 2006). The concept is also simply denoted as service integration (Davy, 2014) which is why we use both terms synonymously.

Integration corresponds to the level of collaboration among internal and external organizational units jointly delivering interdependent tasks (Anderson and Parker, 2013; Gulati et al., 2005; Lawrence and Lorsch, 1967). Accordingly, *service integration* relates to cross-provider collaboration to deliver end-to-end services towards the customer's business. It is mainly focused on the organizational and managerial level (Goldberg et al., 2014). Service integration needs to be differentiated from other similar concepts. In contrast, *system integration* and *service composition* are concerned with the technical lev-

el. Aggregation within the same actor is referred to as *service orchestration* or *service choreography modeling* (Baryannis et al., 2010; Janssen and Gortmaker, 2010; Tan and Sia, 2006).

The need for service integration is largely determined by the level of interdependence between services (Plugge and Janssen, 2014). They are considered interdependent when their outcome depend on one another (Janssen et al., 2006; Thompson, 1967). The management of these interdependencies is a key responsibility of service integration and management (Goldberg et al., 2014a).

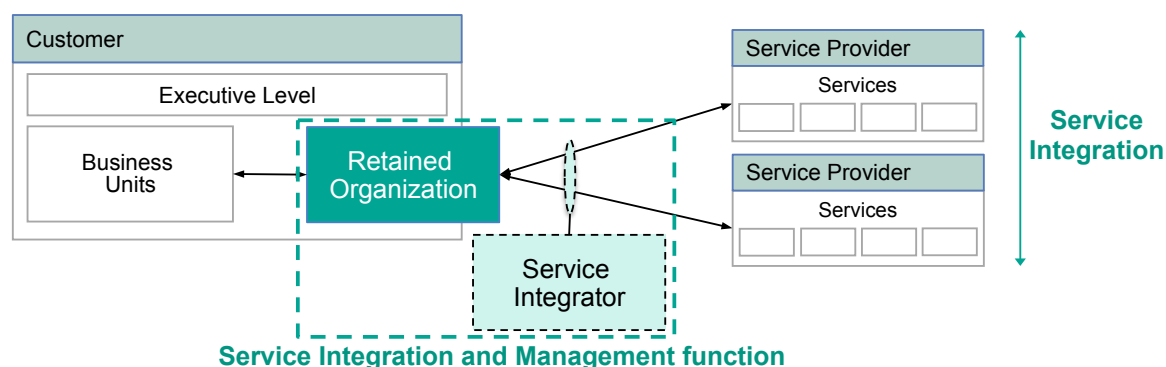


Figure 1. The service integration and management function (based on Goldberg et al., 2014a)

In a recent study, Goldberg et al. (2014a) find that service integration is often performed by the customer's retained organization. Retained organizations are the remaining parts of the outsourced IT functions that stay with the client (Kern and Willcocks, 2001). During outsourcing delivery, this unit is, among other tasks, responsible for governing the outsourcing projects and relationships, as well as for managing providers and business requirements (Gewald and Helbig, 2006; Goldberg et al., 2014b). However, other organizational models exist where service integration is partly or completely delegated to an external party denoted as service integrator (see Figure 1). In this paper, we investigate IT capabilities that should generally exist in a *service integration and management function*. We, thus, abstract from its specific organizational model and the question whether the client, an external party, or both of them jointly perform service integration.

2.2 Related Work on Multi-sourcing and Integration Challenges

Much work has been published regarding challenges for the management of single- and multi-sourcing in general (Goldberg et al., 2014b; Lacity et al., 2009). Bapna et al. (2010) argue, however, that these findings may not be transferable to multi-sourcing with interdependent services. That is, services are not delivered as 'silos' in which providers can act independently. Rather, services depend on each other, and providers need to interact as well as collaborate during service delivery. New challenges will arise that are specific to service integration (Bapna et al. 2010). While no systematic and comprehensive collection of these challenges exists, several research papers provide and discuss relevant challenges.

For example, Anderson and Parker (2013) published an exhaustive research review regarding "integration of distributed knowledge work" including a discussion of relevant challenges. In contrast to our work, however, they focus on integration on the project level. Their findings provide a basis for deriving general service integration challenges. Additional papers provide further insights specifically in the context of knowledge integration (e.g. Jin et al., 2014).

The work of Rajamaki and Vuorinen (2013) is more specifically focussing on the governance of integration management in multi-sourcing. The paper, however, is limited to "public protection and disaster relief" organizations, while our work aims to provide a holistic view on service integration and management. Nevertheless, the authors are mentioning several relevant challenges.

Bapna et al. (2010) suggest that related work on single- and multi-sourcing provides additional starting points for deriving service integration challenges. The authors review existing multi-sourcing research and outline a research agenda for multi-sourcing with interdependent services. They also provide an initial assumption of potential integration challenges in the light of single- and multi-sourcing research. Herz et al. (2012) and Goldberg et al. (2014b) are comparable sources. They discuss several challenges regarding the management of multi-sourcing – without capturing the specificities of interdependent services. Another interesting contribution is the work of Ilmo and Nahar (2010). While investigating the management of multi-sourcing in *international software production projects*, the authors assume interdependent tasks and outline several challenges. Also worth mentioning is the work of Wiener and Saunders (2014), who study multi-provider offshoring. While the authors touch challenges regarding task interdependencies and collaboration, the main focus lies on offshoring.

We analyze these papers following the approach outlined in section 3. We will discuss the challenges derived from literature together with insights from our qualitative study in section 4.

2.3 Related Work on IT Capabilities

IT capabilities have been an important stream in IS/IT research since the 1990s. IT capabilities refer to an IT organization's abilities to enable and foster IT management, to redesign its processes, and/or to achieve desired benefits (Baiyere and Salmela, 2014; Mithas et al., 2011; Ramirez et al., 2010).

Recently, Baiyere and Salmela (2014) published a review of existing IT capability frameworks. Most of the frameworks focus on the IT organization as such and/or the internal deployment of IT resources. Several frameworks regarding client capabilities, however, take into account relationships with and management of external providers. Many of these contributions build on Feeny and Willcocks (1998), whose paper outlines a framework of nine core capabilities to govern and manage IT. Another fundamental contribution is the work of Bharadwaj et al. (1999), who investigate enterprise-wide capabilities to achieve strategic advantage by continuously exploiting IT.

Both papers have a broad focus and are not specific to complex multi-sourcing environments. More importantly, however, both frameworks share a key characteristic with other related work that we analyzed (e.g. Bharadwaj et al., 1999; Cragg et al., 2011; Feeny and Willcocks, 1998; Herz et al., 2012b; Peppard and Ward, 2004; Wade and Hulland, 2004): They consider dyadic external relationships and, thus, do not explicitly cover service interdependencies across several providers.

As already outlined, existing models cannot simply be transferred to multi-sourcing with interdependent services (Bapna et al. 2010). While existing frameworks provide important insights, research needs to develop a better understanding of IT capabilities required for service integration and management.

3 Research Method

To contribute to the understanding of service integration and management, we perform a two-step research study (see Figure 2). First, we extract relevant challenges and frame our main research study based on an analysis of extant literature. Second, we perform focus group sessions as well as expert interviews. We analyze the data collected in a qualitative content analysis (see section 3.3) to develop our IT capability framework. By combining different data sources and collection methods, we realize triangulation to increase consistency and quality of our results.

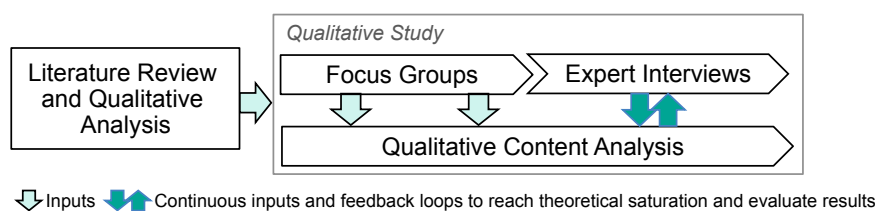


Figure 2. Our systematic multi-staged research design.

3.1 Literature Review and Analysis

The basis for our research is a systematic analysis of extant literature following the methodology proposed by Webster and Watson (2002). We capture the state of the art in research to frame our research study, and extract relevant service integration and management challenges. Two researchers performed the search and analysis simultaneously to avoid subjectivity and potential bias.

To identify relevant literature, we performed a keyword-based¹ full-text search in Google Scholar. We cross-validated search results with other search engines. The initial search found 167 articles and papers, only few of which were relevant for our research: In abstract- or if required full-text-analyses, we selected peer-reviewed journal or conference papers dealing with multi-sourcing service integration and management. To broaden the scope, we also included multi-sourcing papers that assume interdependent services. Thus, we considered 18 papers relevant for our research question. In a systematic forward and backward search originating from these papers, we selected additional eight papers based on the same criteria, summing up to a total of 26 papers.

While we use the complete set of papers to frame our research and foundations, we selected a subset of eleven papers for identifying service integration and management challenges. The selected papers discuss challenges in the context of multi-sourcing with interdependent services. We analyzed these papers in a qualitative content analysis (see section 3.3).

3.2 Qualitative Study based on Focus Groups and Expert Interviews

For our main qualitative study, we collected data from two focus group sessions following the approach of Barbour (2008), and twelve expert interviews based on the method by Gläser and Laudel (2010). The focus group sessions were performed in cooperation with a major outsourcing provider. In the expert interviews, client representatives, IT consultants, and external service integrators participated as well.

The first focus group consisted of two IT architects, an IT outsourcing manager and two consultants. All of them are actively engaged in service integration and management projects. Due to geographical dispersion, the session was performed in a 1.5 hours conference call. All participants were provided upfront with a topical interview guide. Before being engaged in an open discussion, they described their experience with service integration focusing on challenges, success factors, and client capabilities. We repeated the session with a smaller group of three other consultants with service integration experience. The 1.5 hours session was held face-to-face with the same topics and questions.

For the expert interviews, we selected participants via a predefined profile to ensure sufficient experience with the research topic. Interviewees were required to have at least three years of experience with multi-sourcing or service integration. They were either working in a service integration and management function (on the client side or for a service integrator), consulting in this area, or working on the provider side interface. In total, we performed twelve expert interviews across different roles (see Table 1). The interviews were based on an interview schedule and lasted 45 to 90 minutes. We collected information based on broad open-ended questions. Interviewees described their experiences with service integration and management in terms of challenges, ways to overcome these challenges, and success factors. At the end of each interview, we discussed a synthesis of the current state of our research. Each expert reviewed our current set of capabilities and a graphical representation of our framework.

¹ Two independent searches were based on combinations and variations (synonyms) of the following two sets of keywords: (1) multi-sourcing and service integration, and (2) multi-sourcing, IT outsourcing, management and interdependence.

No.	Role	Company
1	Management Consultant	Global Management and IT Consultancy
2	IT Service Integration and Management Consultant	Global Management and IT Consultancy
3	IT Management Consultant	Global Management and IT Consultancy
4	IT Sourcing Manager	Service Integrator for Global Industrial Company
5	Sourcing Architect	Service Integrator for Global Financial Services Company
6	CIO	International Insurance Company
7	Sourcing Manager	International Insurance Company
8	Project Manager, Global SIAM Project	Global Pharmaceutical Company
9	Service Engineer	Global Outsourcing Provider
10	IT Service Management Consultant	Global Outsourcing Provider
11	Lead Client Sourcing Architect	Global Outsourcing Provider
12	Project Executive (SIAM Project)	Global Outsourcing Provider

Table 1. Overview of participants of the expert interviews.

The focus group sessions and expert interviews were digitally recorded. Afterwards, the transcripts were analyzed in a qualitative content analysis.

3.3 Qualitative Content Analysis

In two independent *qualitative content analyses* following the methods outlined by Mayring (2008) and Gläser and Laudel (2010), we analyzed the qualitative data collected from literature and our qualitative studies. Qualitative content analysis is frequently applied to systematically derive inter-subjectively verifiable insights from qualitative data. It is particularly suitable for extracting individual items and categories. To ensure consistency, two researchers performed the analyses independently.

In the two iterative analyses, we extracted paraphrases from each paper or transcript into a master table. With each paraphrasing cycle, we updated our table by clustering and combining items. In case of new paraphrases, we triggered a re-evaluation of previously analyzed material and paraphrases. In the first analysis, we extracted service integration and management challenges from the identified literature. In addition, we derived a basic set of information to frame and guide our qualitative studies. In the second analysis, we analyzed the focus group and interview transcripts to validate the challenges extracted from literature and to derive IT capabilities. We also captured statements that indicate a connection between IT capabilities and challenges. Until we reached a theoretical saturation, we performed additional interviews. That is, additional interviews did not change the results and we were unable to further combine paraphrases without losing information.

In the following three sections, we present and discuss the identified challenges and IT capabilities – as well as relationships between both.

4 Challenges of Service Integration and Management

Generally, the complexity determined by the number of interdependent services and service providers is a key driver for challenges (Anderson and Parker, 2013, Bapna et al., 2010). For example, a consultant concludes during our interviews: “Service integration means you are going to disaggregate, pull apart various services and attempt to manage the interactions explicitly – and that’s hard” (*IT Service Management Consultant, Global Outsourcing Provider*).

This section presents the service integration and management challenges obtained from extant literature. We identify four specific challenges that we summarize in the following. Service integration and management functions have to manage these key challenges: they need to *measure end-to-end services*, *align provider contracts*, *manage relationships and collaboration*, and define appropriate levels

of *standardization and modularization*. Where appropriate, we add exemplary interview statements supporting the challenges.

Measuring services end-to-end

Interdependent multi-sourcing services pose the challenge to correctly measure each provider's contribution. The source of a service failure needs to be determined and its consequences orchestrated. Due to a lack of observability and verification, it is often difficult to define concepts for measuring both individual parts and the whole service (Parker and Anderson, 2002), and to determine each vendor's performance on interrelated tasks (Bapna et al., 2010). Besides correctly monitoring performances against SLA, inappropriate measure points can hinder identification and resolution of incidents across providers. A subsequent issue may be to determine whether individual service providers or unforeseeable events are causing an issue (Ilmo and Nahar, 2010). In agreement, one of our interviewees stated that a "typical problem in multi-sourcing is finger-pointing. Determining who is responsible is a serious difficulty" (*IT Management Consultant, Global Management and IT Consultancy*).

Aligning scope and specifications across provider contracts

Issues are caused by the fact that contracts are often negotiated and signed individually. Consequently, contracts and service levels are unaligned and fragmented (Ilmo and Nahar, 2010). Service levels need to be consistent across contracts when services build on top of each other. This view is supported in our interviews: "Often the parties think they defined the contract well. Most often, they are wrong" (*Project Executive, Global Outsourcing Provider*). If the scope is not aligned – for example the contracts have gaps or are defined overlapping – accountabilities may not be clear end-to-end, which introduces the potential for conflicts (Satzger and Kieninger, 2011).

Managing relationships and collaboration with and between providers

Providers delivering interdependent services need to collaborate (Rajamaki and Vuorinen, 2013). Outsourcing, however, is a competitive business and providers are seeking to increase their own share of service delivery. Each provider aims to protect his intellectual capital and informational advantage. This can lead to hold-ups, tensions, or withholding of information (Ilmo and Nahar, 2010). This is further exacerbated if providers originate from different geographies or cultural areas with different time-zones, languages, standards, and legal norms (Anderson and Parker, 2013; Beulen et al., 2011).

Defining standardization and modularization

To integrate service components to an end-to-end service, their parts need to be appropriately standardized and modularized (Anderson and Parker, 2013). This seems to be challenging for many clients: "The biggest issue is the [...] number of communication paths and dependencies" (*IT Sourcing Manager, Service Integrator for Global Industrial Company*). Interactions between services must be controlled to enable effective coordination between providers. In this regard, providers used to adapt their processes to fit the client environment. The growing number of providers with highly standardized proprietary service offerings now increasingly shifts this responsibility to the client: "There are no standards for the future. All providers have their own set of rules. Clients have to play by the service provider's rules" (*Service Engineer, Global Outsourcing Provider*). Clients need to find ways to integrate the proprietary offerings.

To master the challenges just mentioned, we argue that service integration and management functions require specific IT capabilities that we present and discuss in the following section.

5 Service Integration and Management Capability Framework

Based on our focus groups and expert interviews, we identify six capabilities for service integration and management. They are positioned in a framework that should help to channel future research, and support the development of service integration and management.

Our analysis reveals that managing the service integration governance is a central capability, which is tying the other five capabilities together. Therefore, we place it in the center of the graphical represen-

tation of our framework (see Figure 3), which has been developed and evaluated together with the experts. The remaining capabilities are placed around it. Based on our study insights, we argue that the six identified capabilities are required to address the service integration and management challenges developed above.

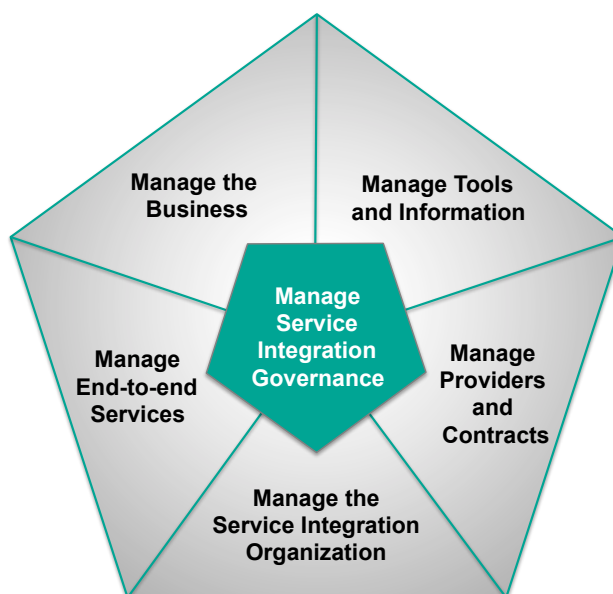


Figure 3. The Service Integration and Management Capability Framework

In the following, we introduce and discuss each capability. Where possible, we provide illustrative interview statements and link capabilities to existing research.

5.1 Capability 1 – Manage Service Integration Governance

For service integration, organizations need to be capable of defining, establishing and continuously adapting the service integration governance. It frames the remaining capabilities by establishing the rules and blueprint for the distributed service solutions: “IT Governance and IT architecture are enablers for service providers to integrate with each other” (*Project Manager, Global Pharmaceutical Company*).

Academic literature outlines the importance of IT governance to manage and integrate service providers (Herz et al., 2012b; Plugge and Janssen, 2014). The *service integration governance* defines a framework to ensure support for business goals. It defines structures, rules, and mechanisms to encourage desirable behavior, and to foster coordination and cooperation (Gulati et al., 2005; Plugge et al., 2013). By outlining a *service integration architecture*, the capability also covers the blueprint for the distributed organization and its technology (Anderson and Parker, 2013). Our findings particularly emphasize the importance of clearly defined accountabilities and responsibilities that need to be continuously adapted to changing integration requirements: “Roles and responsibilities must be very clear and the governance towards the [business] customers as well as the governance towards the service providers need to be aligned” (*Management Consultant, Global Management and IT Consultancy*). Important instruments identified in our interviews are standard operating procedures and cross supplier procedures, which define the expected behavior of all parties. In this regard, one expert stated that “clear guidelines and common principles” are a “prerequisite for successful service integration” (*IT Service Management Consultant, Global Outsourcing Provider*).

To build and manage services end-to-end, the service integration and management function requires understanding of the complete service solutions delivered by different providers. Therefore, they need to be capable of defining the *service integration architecture* in alignment with the overarching enterprise architecture. Clients need to “ensure that contracted services fit with the existing service portfo-

lio from an architectural perspective” (*IT Sourcing Manager, Service Integrator for Global Industrial Company*). Additionally, our findings show that they have to understand relationships between individual modules, and define interfaces between these. This enables the client to easily exchange individual service components or whole service providers.

5.2 Capability 2 – Manage the Service Integration Organization

It is imperative to be able to develop and manage the distributed organization in accordance with changing business requirements. The organizational design needs to be defined, including structures, roles and required skills. There is a need for aligning cultures, implementing organizational changes, and ensuring collaboration between all stakeholders. The goal is to build a “function that performs the role of integration such that one face is presented to the business” (*Service Engineer, Global Outsourcing Provider*).

With growing need for integration due to multi-sourcing complexity, the structure of the IT organization and its interfaces with business and providers will also change (Goldberg et al., 2014a). Our study findings show that customers need to continuously adapt the structures of the organization and its relationships in alignment with business needs and the provider portfolio. “Service integration must be organized in a way that enables ‘orchestration’ of services to meet business requirements” (*Project Manager, Global Pharmaceutical Company*).

In line with research (Bapna et al., 2010), we found that collaboration among providers is required to achieve service integration effectiveness: “Collaboration, transparency and relationship management [...] are very critical success factors” (*Management Consultant, Global Management and IT Consultancy*). A solution identified in literature is to reward cross-provider relationships (Kim and Netessine, 2013; Wiener and Saunders, 2014a). Incentives rewarding desired behavior and collaboration are also mentioned in our interviews.

In addition, our experts articulated the need for ongoing skill management as well as organizational change management to manage expectations, mindsets, cultures and communication. As one consultant put it: “A cherry-picked selection of providers – each of them in themselves the best – is worth nothing if they do not fit together. Particularly cultures and expectations need to be aligned” (*Management Consultant, Global Management and IT Consultancy*). This is in line with findings of previous studies highlight organizational change management and communication as important topics (e.g. Goldberg et al., 2014b; Srikanth and Puranam, 2011).

5.3 Capability 3 – Manage the Business

The ability to manage business demand and develop a service portfolio in alignment with business requirements is needed. Strategic models for financial management and charge back of costs to the business need to be developed and agreed.

In our interviews, service integration and management functions are identified as the key and single interface with the business: “It should not be visible [for the business] that multiple companies are working towards the same end-to-end service” (*IT Service Management Consultant, Global Outsourcing Provider*). According to study findings, a key responsibility is to understand and pro-actively manage business demand to fulfill business needs with an appropriate set of IT services. For example, one sourcing manager argues: “We need to understand our business to select, manage and coordinate the services that support the strategy of the enterprise” (*IT Sourcing Manager, Service Integrator for Global Industrial Company*).

The selected services should comply with the business’ economic and technical requirements (Herz et al., 2011). In order to do this, a clear understanding of the outsourced services is required. The service portfolio needs to be continuously adapted to business priorities and expectations. Therefore, we identify business and IT alignment as a key goal of this capability.

Lastly, “varying charging models introduced by different outsourcing providers and the different delivery models of cloud services need to be aligned into a coherent costing model and charged back to the business” (*Management Consultant, Global Management and IT Consultancy*). Hence, service integration and management functions need to manage financials with the business units, and define charge-back models in line with the business requirements. They need to actively determine and manage these costs and charge-backs.

5.4 Capability 4 – Manage Tools and Information

Service integration and management functions need to manage distributed information and the integration tool solution. They need to be able to ensure and maintain knowledge and information coherence across distributed service delivery units. “Distributed information should be made available to the various stakeholders that play together in the multi-sourcing context via a service integration management platform” (*Service Integrator for Global Financial Services Company*).

Research emphasizes tool integration as enabling knowledge management (Amaral et al., 2011; Anderson and Parker, 2013). In this regard, one expert argued that “the most difficult competency is to integrate the diverse tooling solutions applied by the different providers” (*IT Service Management Consultant, Global Outsourcing Provider*). Service providers use various service management solutions for example to manage incidents or to perform reporting. To enable integration, their number needs to be reduced (Rajamaki and Vuorinen, 2013) or tightly integrated to realize the benefits of multi-sourcing. Accordingly, we identify integrated tooling as a key enabler for service integration effectiveness. Integrated tools are required to manage cross-provider incidents and changes, and to make required information available to stakeholders.

Traditionally, vertical and horizontal information systems can be differentiated. While the former support hierarchical management of service interruptions, the latter support lateral relationships and connect people across client and provider organizations enabling and enhancing integration (Bardhan et al., 2013; Chen, 2007; Galbraith, 1973).

5.5 Capability 5 – Manage Providers and Contracts

Service integration and management functions need to be able to select an appropriate provider portfolio. They have to manage the providers according to the outsourcing contracts, transition services between them and define cross supplier procedures.

Clients need to select providers that fit into their existing portfolio considering strengths and weaknesses regarding economic and technical criteria (Herz et al., 2012a; Parker and Anderson, 2002). In accordance with Ilmo and Nahar (2010), our results indicate that providers should also comply with the corporate culture of both client and other providers. After the selection, services or partial services need to be transitioned to the provider and be seamlessly integrated with the existing service portfolio.

During service delivery, clients need to ensure that outsourcing contracts are fulfilled and service level targets are met (Cohen and Young, 2006). Academic research shows that often the implicit contracts and, thus, their psychological aspects are becoming more and more important in the area of interdependent multi-sourcing solutions (Anderson and Parker, 2013; Handley and Benton, 2013).

5.6 Capability 6 – Manage End-to-end Services

Organizations need to be able to understand and manage services end-to-end. This includes the definition of end-to-end SLAs, service measurement and quality management.

Literature already identified IT service management as an important aspect in multi-sourcing service integration (Schermann et al., 2006), which is in line with our findings. For example, a service integrator stated: “Service management is the core of service integration: Making sure that things are working and if they are not working then getting them fixed” (*Service Integrator for Global Industrial Corporation*).

However, our study unveils that traditional IT Service Management “needs to evolve into end-to-end service management” (*Sourcing Architect, Service Integrator for Global Financial Services Company*). Similarly, another expert argued that “a consistent end-to-end service view needs to be introduced. Isolated analyses are not enough anymore” (*IT Service Integration and Management Consultant, Global Management and IT Consultancy*).

Service delivery needs to be monitored with regards to quality, cost and timeliness based on detailed reports (Ilmo and Nahar, 2010; Schermann et al., 2006). It is important that all involved parties understand SLAs and their resulting accountabilities. To manage behavior among providers, research suggests Operational Level Agreements (Plugge and Janssen, 2014; Rajamaki and Vuorinen, 2013). Our findings particularly emphasize the need for matching service levels across contracts to ensure end-to-end consistency: “You need to ensure that you can actually deliver your SLA. Service levels of the individual contracts need to sum up to the targets committed to the business” (*IT Service Integration and Management Consultant, Global Management and IT Consultancy*). In this regard, research outlines potential approaches (Kieninger et al., 2011, Kieninger et al., 2013).

6 Mapping Between Challenges and IT Capabilities

We aim to develop a better understanding of IT capabilities required to achieve effective service integration and management by overcoming its specific challenges. In the following, we map the developed IT capabilities with the identified challenges (see Table 2).

Capabilities	Challenges			
	Measuring services end-to-end	Aligning scope and specifications across provider contracts	Managing relationships and collaboration	Defining standardization and modularization
Manage SI Governance	+	+	+	+
Manage SI Organization	o	-	+	o
Manage the Business	o	+	+	-
Manage Tools & Information	+	o	o	o
Manage Providers and Contracts	+	+	+	o
Manage End-to-end Services	+	+	o	o

(Legend: connection supported by >50% (“+”), 25%-50% (“o”), or <25% (“-”) of the interviews)

Table 2. Mapping between capabilities and challenges to be resolved

Based on paraphrases, we collect potential connections during our qualitative content analysis (see section 3.3). If paraphrases from at least 50% of the interviews indicate a connection, they are marked with “+”. If a connection is supported by 25% to 50% of the interviews, they are marked with “o”. Lastly, “-“ indicates that we identified supporting statements in less than 25% of the interviews.

We can see that the IT capabilities can be matched to the key challenges. Each capability is strongly related (“+”) to at least one challenge. The strongest relation can be associated with governance: We identify supporting paraphrases with all four challenges in more than half of our interviews. In turn, each challenge is associated with at least one capability.

As they build on paraphrases from qualitative data, the relations only provide an initial overview of potential connections that need to be further evaluated. We hypothesize that the relations could indicate causal links. In our opinion, future research should focus on three aspects. First, originating from the identified relations, we propose future research activities to confirm potential causal links. Both qualitative (e.g. case studies) and quantitative studies should be used to confirm these links. Second,

researchers should identify and assess contingency factors: Under which circumstances does a capability effectively tackle challenges? Are there situations in which another capability is more important and, thus, more significantly influences a challenge? Third, research should develop appropriate measures to implement and further develop the identified capabilities. We particularly encourage the development of implementation guidelines. Taking into consideration the clients' contingency factors, the guidelines should outline a roadmap for maturing the proposed capabilities and for addressing the relevant challenges.

7 Conclusion

In this paper, we presented the findings of our explorative study on multi-sourcing service integration and management. Based on existing literature, focus group sessions, and expert interviews, we applied a systematic scientific approach to answer our research question: *Which IT capabilities enable organizations to address the relevant challenges of service integration and management in the context of multi-sourcing with interdependent services?* We derive and discuss four key challenges, a framework of six important IT capabilities and a mapping of the relationships between them. By mapping these capabilities to the four key challenges identified, we address our research question.

The integration of interdependent multi-sourcing services is difficult for many clients. For example, they face challenges in managing end-to-end services or in managing cross-provider relationships and collaboration. Our framework of six IT capabilities should enable service integration and management functions to address these challenges.

Our review of extant literature unveils that service integration and management is still under-researched. Although our contribution adds to the body of existing literature, there are several opportunities for additional research to better understand service integration and management in addition to the steps outlined in section 6. Previous research (Goldberg et al., 2014a) identified models for organizing service integration and management. Our framework abstracts from these models and evaluates IT capabilities for the function as a whole. Future research should apply our capabilities to the organizational models. For example, research could evaluate how the capabilities are distributed and implemented in the different organizational configurations.

Interrelations between capabilities are also targets for future research. Based on our study, we already found that service integration governance plays a key role. Research should further investigate how the capabilities interrelate and define approaches for clients to mature them. In this regard, it would also be interesting to find out how the capabilities contribute to service integration and management effectiveness. Research could develop quantitative metrics per capability to determine the clients' maturity.

A few limitations regarding our work certainly need to be considered. The number of twelve expert interviews can be considered as rather small. However, we based our qualitative content analysis on a triangulated combination of a literature, focus groups, and expert interviews. We involved a total of 20 experts in our study. We decided not to perform additional interviews only when we had achieved a theoretical saturation. Hence, we are confident that the qualitative study base is sufficient to derive our capability framework. We encourage further research to fully generalize and support our findings.

The number of interviewed clients in our study is relatively low, as our main source of information are provider-side experts, management consultants and experts from service integrators performing this role for clients. This could potentially introduce bias in our research. There are two main reasons for our decision: First, service integration and management has different activities that can potentially be delegated to providers (e.g. providers are taking over a guardian vendor role). To holistically investigate service integration and management, we think that it is most appropriate to include all relevant parties involved in the integration process. Second, the concept of service integration and management is relatively new to many clients. Provider representatives and consultants, on the other hand, can build on experience from several multi-sourcing situations. Hence, we think that they are particularly

adept to evaluate typically required IT capabilities. Nevertheless, we plan to perform further client side evaluations of our results.

Our capability framework provides clients with several key insights affecting service integration effectiveness. As our study suggests, the identified capabilities address the specific challenges of service integration. This implies that clients implementing multi-sourcing with interdependent services should build the outlined capabilities in their organization. Particularly, our work emphasizes the need for appropriate service integration governance. At the beginning, each service integration project should focus on this capability as it provides the foundation for service integration and management functions. Together with the other five capabilities, multi-sourcing clients can effectively manage their portfolio of interdependent services. Our IT capability framework provides IT managers with a guide to establish their distributed service integration and management functions. Based on the insights from our work, they should build and mature each of the six IT capabilities.

A conscious and systematic implementation of the distributed service integration and management function should contribute to the effectiveness of multi-sourcing engagements, strong partnerships with providers, and, thus, overall multi-sourcing and business success.

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