On the right track
Service network orchestration in the railway industry

Master’s Thesis 30 credits
Department of Business Studies
Uppsala University
Spring Semester of 2016

Date of Submission: 2016-05-27

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Abstract

Nowadays, service is increasingly created by cross-functional collaboration within service networks. A service network can be orchestrated by one central company, which is named coordinating hub in the present study. This study examines the contemporary and unexplored phenomenon of service network orchestration in the passenger railway markets in Sweden and Germany. It is the first to offer a definition of service network orchestration and presents a novel service network orchestration model by synthesizing business network orchestration and service marketing literature. The model’s applicability in practice is examined by qualitative empirical data derived from a multiple case study. The findings of this study confirm the proposed model’s practical applicability. Nevertheless, the findings suggest that service networks found in practice include a greater variety of partnerships than the current literature indicates. 1) The partner firm’s proximity to the coordinating hub (i.e. internal vs. external) and 2) the coordinating hub’s involvement in the partnerships (i.e. high vs. low) are found to create contexts that require distinct orchestration activities. Based on these findings, a set of takeaways is formulated, which contributes to a holistic understanding of service network orchestration that is relevant in both theory and practice.

Key words: Service network orchestration; Service networks; Business networks; Business network orchestration; Service marketing; Service-dominant (S-D) logic; Service transition; Hub coordination activities; Railway industry; Passenger ground transportation industry
Acknowledgements

Uppsala 2016-05-27.

We would like to take this opportunity to express our sincere gratitude to everyone who has contributed to this thesis by providing support and guidance throughout the entire research process.

First and foremost, we would like to thank our supervisor David Sörhammar, Ph.D. & assistant professor at Uppsala University. Your guidance and insights have been highly valuable to us during the past four months.

Secondly, we wish to thank all of our interview respondents who gave us their time and attention. Without the interesting conversations and discussions we had, this thesis would not have been possible.

Thirdly, we would also like to express special thanks to our opponents for all your constructive feedback, which further developed this thesis in various ways. Moreover, we would like to thank our proofreaders, who read the thesis through over and over (and over).

Finally, we wish to thank our parents and friends for their enduring support throughout our entire education. This thesis and everything that stands behind it would not have been possible without you.

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1. Introduction

During the past decades, more and more industries have been opened up for freer market competition, leaving many (formerly) state-owned enterprises struggling after their legally mandated monopolies have been disestablished. This phenomenon can be clearly observed in the European passenger ground transportation industry. Starting in the 1990s, the industry has been subjected to several reforms and restructurings in many European countries in order to foster greater competition (Cantos et al., 2012). The developments in the Swedish and German markets are in accordance with the Europe-wide restructuring process. The Swedish national railway company SJ used to be the sole long-distance railway operator in Sweden. However, in 2010 the market was liberalized for private rail companies (Alexandersson et al., 2012). Since March 2015, for instance, the Hong Kong-based company MTR Corporation is operating trains on one of SJ’s main revenue creating lines between Stockholm and Gothenburg (Railway Technology, 2015). While SJ is facing direct competition on the long-distance railway tracks, the national railway company in Germany, Deutsche Bahn (DB) with its long-distance subsidiary DB Fernverkehr, is still a de-facto monopolist on the long-distance tracks. However, the company encounters indirect competition from long-distance buses, ever since the German long-distance bus market was liberalized in 2013 (Frankfurter Allgemeine Zeitung, 2012). Due to this, DB Fernverkehr is notably losing customers and experts predict significant revenue losses (Horizont, 2014). In contrast, financial losses of SJ resulting from the increased competition have not been noticed so far (Annual Report SJ, 2014). However, as indicated above, MTR has just started operating on SJ’s most profitable line. Moreover, since SJ received the lowest customer satisfaction scores among all Swedish transportation companies in the year 2014 (Svenskt Kvalitetsindex, 2015), it can be argued that there is at least the potential for revenue losses due to the combination of increased competition and customer dissatisfaction.

Both SJ and DB are owned by their respective states and both companies have to fulfill financial obligations determined by their owners, such as reaching a return on operating capital of seven percent (SJ; Annual Report SJ, 2014) or the payment of a pre-determined dividend (DB; Tagesschau, 2015). Hence, both companies need to find a way to face the new competitive market situation in order to reach the financial targets and, thus, to legitimate their future existence. The companies’ ways of functioning are differing: SJ is solely operating the passenger trains while working closely together with independent organizations, which are responsible for essential components within SJ’s service such as managing the tracks and stations. In contrast, DB is conducting the majority of tasks connected to its service in-house by means of numerous subsidiaries. However, both companies have in common that they show an enhanced and
expanded service orientation in order to address the newly arisen competition in their respective markets. For instance, both companies have implemented a more holistic perspective from offering solely train rides towards providing mobility service from the customers’ home to their final destinations by means of digital solutions (Usabilla, 2015) and multi-modality approaches (DB Annual Report, 2013).

To offer such a mobility service, both companies are working with external partner firms that provide core competencies which go beyond the case companies’ own competencies. This is in line with Kindström and Kowalkowski’s (2009) research findings that service provision requires more cross-functional collaboration than traditional product development. However, Jaakkola and Hakanen (2012) note that while research on networks in a business context has a long history, research on their role in service creation remains scarce. In accordance, Ostrom et al. (2015, p. 136) raise the question “How can service firms efficiently allocate resources and divide tasks between actors in a (...) network?”. Hence, a research gap particularly regarding the management of service networks executed by focal entities is identified. Accordingly, the international service research community determines “Developing service networks and systems” as one of the twelve research priorities in the field of service research (Ostrom et al., 2015, p. 127).

The well-established research on networks in a business context, which Jaakkola and Hakanen (2012) are referring to, is based on the perspective that “every business enterprise is deeply rooted in its specific context” (Håkansson & Snehota, 1995, p. 12) which both provides opportunities and constraints. Part of this ‘specific context’ is a company’s business network, which can be defined as “two or more connected business relationships” (Blankenburg Holm et al., 1999, p. 473). While some scholars argue that business networks cannot be managed by one firm (e.g. Håkansson & Ford, 2002; Håkansson & Snehota, 1995), network orchestration literature describes that networks can intentionally be orchestrated by so-called hub firms (e.g. Dhanaraj & Parkhe, 2006; Möller et al., 2005). The hub firm has a central position in the network and it exerts its influence to perform a leadership role according to its agenda within the network (Dagnino et al., 2016; Dhanaraj & Parkhe, 2006). This is in line with Ostrom et al. (2015) who describe a purposeful allocation of resources and tasks between network actors executed by central firms in a service context in the above-stated quote. Subsequently, a hub firm can navigate and maintain a transition of its business network towards an increased service orientation. This transition to offering enhanced service is often cited as a critical issue for firms facing increased competition (e.g. Kowalkowski et al., 2012; Oliva & Kallenberg, 2003). In accordance, Vargo and Lusch (2004) have observed a change in marketing paradigm from a goods-centered logic towards a service-centered logic which integrates goods and services to combinations that “allow better outcomes than the sum of the
individual components” (Sawhney, 2006, p. 8) and, therefore, can lead to competitive advantages (Oliva & Kallenberg, 2003).

SJ and DB Fernverkehr are identified as hub firms engaging in service network orchestration in order to address the increased competition resulting from market liberalizations in their respective markets, since both companies engage and coordinate other network actors in order to pursue their service business ideas. This is named hub coordination, executed by SJ and DB Fernverkehr as coordinating hubs in the present study. Moreover, the coordinating hubs SJ and DB Fernverkehr are identified to orchestrate their service networks in partly differing contexts, which is a result of the companies’ varying ways of functioning. While SJ’s service network solely consists of external partner firms, DB Fernverkehr’s service network includes both internal and external partner firms that require distinct hub coordination activities to be orchestrated. Mirroring the unexplored nature of service network orchestration (cf. Ostrom et al., 2015), there is no commonly accepted definition in existence. Therefore, for the purpose of this study service network orchestration is defined as the orchestration of two or more business partnerships involved in resource integration for service exchange conducted by a coordinating hub.

In order to address the identified research gap regarding the orchestration of service networks executed by central entities (i.e. coordinating hubs), this study aims to answer the following research question:

*How are service networks orchestrated by coordinating hubs?*
1.1 Research purpose and structure

The study at hand contributes to an extended understanding of the contemporary phenomenon service network orchestration, which is identified to require more research by the international service research community (cf. Ostrom et al., 2015). To address this aim, a novel service network orchestration model is proposed by utilizing a synthesis of the theoretical fields of 1) business network orchestration and 2) service marketing as a theoretical framework. The proposed model contains the following four domains: Hub coordination, Resources, Relationships and (Institutionalized) Rules, which are identified to be of utmost importance for service network orchestration. This model is then utilized as a theoretical foundation for investigating how SJ and DB Fernverkehr orchestrate their networks in order to offer (enhanced) service as a way of addressing the new competition in their respective markets. Simultaneously, the proposed service network orchestration model is evaluated regarding its practical applicability by means of the collected empirical data. As indicated above, the ways of functioning of this study’s case companies SJ and DB Fernverkehr differ, which influences the companies’ hub coordination activities while orchestrating their respective service networks. Rather than comparing the case companies’ approaches, this study utilizes the identified difference for providing holistic knowledge about service network orchestration. To conclude, this study contributes to a holistic understanding of service network orchestration with findings being valuable for future research as well as practice.
2. Literature Review

2.1 Service network orchestration: a theoretical framework

While research on networks in a business context has a long history (Wilkinson, 2001), research on their role in the creation of service remains scarce (Jaakkola & Hakanen, 2012). As indicated above, this is especially the case when it comes to the orchestration of networks in a service context (cf. Ostrom et al., 2015). To the authors’ knowledge no commonly accepted definition for service network orchestration exists. Consequently, for the purpose of this study service network orchestration is defined as *the orchestration of two or more business partnerships involved in resource integration for service exchange by a coordinating hub.* In order to provide a theoretical framework for the orchestration of service networks, the theoretical fields of 1) business network orchestration and 2) service marketing are discussed and subsequently synthesized. From that a service network orchestration model is derived, which is presented in Figure 1 at the end of this chapter.

2.1.1 From business networks to network orchestration

The well-established business network research is based on the perception that a company cannot be separated from its surrounding business network, which provides opportunities as well as constraints (e.g. Häkansson & Snehota, 1989). Business networks can be defined as “two or more connected business relationships” (Blankenburg Holm et al., 1999, p. 473). Häkansson and Ford (2002, p. 133) explain further that both the relationships and the connected actors are “heavy with resources, knowledge and understanding”. In accordance, business network literature commonly emphasizes that a business network can provide access to varied resources and can therefore lead to competitive advantages (e.g. Burt, 1992; Häcki & Lighton, 2001; Lorenzoni & Baden-Fuller, 1995). Researchers of the Industrial Network Approach (INA) argue that business networks are organically evolved, self-organizing and, therefore, cannot be intentionally managed (i.e. orchestrated) by one of the network actors (e.g. Häkansson & Ford, 2002; Häkansson & Snehota, 1995). Nevertheless, Möller et al. (2005) adopt the position that both organically evolved and intentionally developed network types exist, whereby the latter is managed by a central entity. In accordance, business network orchestration literature describes that business networks can purposefully be “orchestrated” (Dhanaraj & Parkhe, 2006) or “engineered” (Doz et al., 2000) by so called “hub firms” (Möller et al., 2005). Thereby, a hub firm can be defined as a firm “that possesses prominence and power gained through individual attributes and a central position in the network structure” (Dhanaraj & Parkhe, 2006, p. 659) and which exerts this influence to perform a leadership role within the network. As indicated above, a firm that is acting like previously described in a service context is named a coordinating hub in the present study.
2.1.2 Networked nature of service creation

The implementation and creation of expanded service, referred to as “servitization” (Visnjic Kastalli & Van Looy, 2013) or enhanced “service orientation” (Homburg et al., 2002), can be exerted by a coordinating hub on a network level (cf. Ostrom et al., 2015). Over the past few years servitization has become an important research topic, as “companies […] are increasingly seeking service-led growth” (Ostrom et al., 2015, p. 134) due to a higher specialization of tasks found in today’s business world, which creates an increased demand for service (e.g. Oliva & Kallenberg, 2003; Vargo & Lusch, 2008). According to service marketing researchers (e.g. Gummesson, 2002; Vargo & Lusch, 2004), this indicates a change in business logic. It is described that the tipping point in the transition towards a service centered logic has been passed (Day, 2004), which has the exchange of intangible resources, such as specialized skills, knowledge and processes, in its focus (Grönroos & Voima, 2013; Vargo & Lusch, 2004). Accordingly, Vargo and Lusch (2004, p. 2) define service as “the application of specialized competences through deeds, processes, and performances for the benefit of another entity or the entity itself”. Subsequently, marketing is regarded as a continuous series of social and economic processes. Hence, in line with research on business networks, service creation is described to take place through activities “among a whole host of actors” who essentially do the same things: integrate resources and engage in service exchange (Vargo and Lusch, 2016, p. 9). Consequently, the service logic in marketing is described to be constitutionally relational (e.g. Grönroos, 1994). In their interactions the network actors constrain and coordinate themselves through institutions (aides to collaboration, such as rules, norms, practices) and institutional arrangements (aggregations of institutions), which make social life (e.g. network interaction) meaningful (Vargo & Lusch, 2016).

2.1.3 The four domains of service network orchestration

Based on the previously discussed literature on business network orchestration and service marketing, four domains can be identified as being of utmost importance in the context of service network orchestration. These domains are 1) Hub coordination (e.g. Dhanaraj & Parkhe, 2006; Huxham & Vangen, 2000), 2) Resources (e.g. Ballantyne & Varey, 2006; Möller & Rajala, 2007; Vargo & Lusch, 2004), 3) Relationships (e.g. Paquin & Howard-Grenville, 2013; Ritter et al., 2004; Lusch & Vargo, 2014) and 4) (Institutionalized) Rules (e.g. Lipparini et al., 2014; Saz-Carranza et al., 2008; Vargo & Lusch, 2016). In the following, the array of the four domains will be reasoned. Thereby, the present study does not adopt a transaction cost economics perspective, which conceptualizes how organizational forms such as networks are shaped based on make-or-buy decisions that are guided by the desire to minimize governance costs (Santos & Eisenhardt, 2005). Moreover, in contrast to numerous previous studies on service provision, which utilize a
resource-based view (Barney, 1991), the study at hand does not only focus on the resources controlled within the four walls of the coordinating hub. Instead, it is argued that the coordinating hub engages in service network orchestration to gather and coordinate partner firms with desired resources, which enable the provision of an integrated service. Hence, service provision is regarded to include relational processes (Tuli et al., 2007) that can be orchestrated by a coordinating hub. Therefore, \textit{Hub coordination} is identified as being the first domain of service network orchestration. As indicated above, it is executed by a coordinating hub, which depicts the center of the service network and coordinates the resource integration and service exchange (cf. Lusch & Vargo, 2014; Vargo & Lusch, 2016) within the network by exerting the influence resulting from its central position. Thus, it is responsible for ‘making things happen’ (Huxham & Vangen, 2000). In order to do so, the coordinating hub is expanding its own resource base by engaging partner firms with desired resources. While business network orchestration literature emphasizes the importance of accessing resources in general (e.g. Lorenzoni & Lipparini, 1999), service marketing literature particularly emphasizes intangible and dynamic resources (e.g. Grönroos & Ravald, 2011). Hence, \textit{Resources} depicts the second domain of service network orchestration. In order to access the desired resources, the coordinating hub engages in relationships with partner firms, in which the above-mentioned relational processes are taking place. Emphasizing the importance of relationships, Ritter et al. (2004, p. 176) state “a firm’s ability to […] manage successfully its relationships […] may be viewed as a core competence”. Therefore, \textit{Relationships} is identified as the third domain of service network orchestration. Lastly, in accordance with Vargo and Lusch’s (2016, p. 11) conception of institutions and institutional arrangements, which “make social life […] meaningful”, business network orchestration publications underline the importance of shared values, norms and a common culture within the network, which need to be ensured by the coordinating hub for successful network orchestration (cf. e.g. Saz-Carranza et al., 2008). Encompassing the abovementioned components, \textit{(Institutionalized) Rules} is identified to be the fourth domain of service network orchestration. The four domains are visualized in the proposed service network orchestration model (cf. Figure 1).
2.2 Proposed service network orchestration model

As Figure 1 portrays, the above-described four domains of service network orchestration are integrated in a proposed service network orchestration model. Thereby, the domains are interrelated, partly overlapping (cf. chapter 2.2.5) and intentionally defined broadly, which is argued to be beneficial for an extensive understanding of the complex and widely unexplored field of service network orchestration. The domains are discussed in further detail in this chapter. Moreover, an overview of the domains and their respective conceptual definitions is presented in Table 1 at the end of this chapter.

2.2.1 Hub coordination

As illustrated above, hub firms in a network orchestration context form the center of the network and perform a leadership role within that network. Dhanaraj and Parkhe (2006, p. 659) describe that network orchestration executed by a hub firm includes “deliberate, purposeful actions […] to create value […] and extract value […] from the network”. This is called hub coordination in the proposed service network orchestration model. Subsequently, the coordinating hub ideally leverages benefits of business networks, such as decreased costs and risks of business activities due to the division to several network actors (Müller-Seitz & Sydow, 2012), knowledge and information flows (Lorenzoni & Lipparini, 1999) and the detection of opportunities (Burt, 1992; Granovetter, 1973).
Thereby, the coordinating hub has the responsibility to assemble, orchestrate and govern the service network or, as Huxham and Vangen (2000, p. 1160) put it, “to make things happen”. It is in charge of setting and communicating a vision resulting from a business idea (Lorenzoni & Baden-Fuller, 1995, p. 1160). To implement this vision, a coordinating hub needs to continuously look for and engage network actors with desired resources and capabilities, and facilitate interaction between those actors (Paquin & Howard-Grenville, 2013). The coordinating hub is mainly responsible for acquiring and improving the collection of desired operant and operand resources (Vargo & Lusch, 2004), which then are integrated and transformed within the service network (cf. Vargo & Lusch, 2016). A service network’s underlying strategy is ideally conceptualized and implemented in collaboration between the hub firm and its partnering firms (Lorenzoni & Baden-Fuller, 1995), underlining the co-created character of service (Vargo & Lusch, 2016). Strategizing as a shared process goes hand in hand with collectively structuring the relationships within the service network, since “when each partner’s resources [...] are so essential to the success [...] new forms [of working together, remark of authors] must be designed” (Lorenzoni & Baden-Fuller, 1995, p. 157).

Service network orchestration can be challenging, resource-demanding and multiple paradoxes can arise during the process (Lorenzoni & Baden-Fuller, 1995; Provan & Kenis, 2007). For instance, coordinating hubs need to balance flexibility and stability. Flexibility is described as one of the inherent strengths of a network set-up and it makes the service network able to respond to market changes quickly, while stability has the potential to increase the overall efficiency of the service network and strengthen the involved relationships (Lorenzoni & Baden-Fuller, 1995; Provan & Kenis, 2007). However, if there is too much control involved in the hub coordination, it is argued that the responsiveness of the network decreases, thus diminishing joint development possibilities of operant resources such as innovation and efficiency capabilities (Wilkinson & Young, 2002). Moreover, coordinating hubs must be able to balance inclusiveness versus efficiency. Inclusiveness fosters greater participation levels and engagement from partnering actors thus promoting resource exchange and integration within the service network, but it can lead to longer operating processes (Provan & Kenis, 2007). On the other hand, efficiency enhances the overall process speed but can decrease commitment and the willingness of resource contribution from the partnering actors (Provan & Kenis, 2007). Therefore, the possibility to use potential resources, which could be integrated other resources to produce effects, would remain unused (cf. Vargo & Lusch, 2004).
2.2.2 Resources

A goods-centered logic regards static and finite resources as primary. This notion goes back to ‘the father of economic thought’, Adam Smith (1776; reprinted 2001), who labeled only those kinds of goods and resources as productive that could be exported for trade and contribute to national wealth. Vargo and Lusch (2004) name this kind of resources ‘operand resources’, defined as resources on which an operation is performed. In contrast, in a service network orchestration context, ‘operant resources’ are regarded as primary, which are defined as employed to act on operand and other operant resources to produce effects (Vargo & Lusch, 2004). Operant resources are often invisible, intangible, dynamic and infinite (Vargo & Lusch, 2004). Therefore, Vargo and Lusch (2004, p. 2) argue “resources are not; they become”. Lusch and Vargo (2014, p. 102) further describe that “businesses, households, and other organizations engage in the acquisition, integration, and transformation of resources to create new resources and then use these […] in exchange with other actors to co-create value”. Subsequently, the service network actors as well as the relationships connecting them become operant resources of utmost importance, acting on operand and other operant resources to produce effects (cf. Vargo & Lusch, 2004; Håkansson, 1987). Accordingly, by combining partnering actors with unique resources with its own resources, and by collectively integrating and transforming these different sets of resources to “idiosyncratic complementary resource combinations” (Lorenzoni & Lipparini, 1999, p. 318), a coordinating hub can orchestrate a successful service network.

A third important operant resource, along with network actors and network relationships, is knowledge (e.g. Ballantyne & Varey, 2006; Dagnino et al., 2016; Vargo & Lusch, 2004). For instance, Möller and Rajala (2007, p. 903) describe that a network’s ability to “exploit the specialized knowledge held by each actor but also to expand this knowledge through collaborative learning” as crucial for a network’s success. Ballantyne and Varey (2006) state that especially tacit knowledge is derived from collaborative learning, which can be defined as context-specific and hard to formalize and circulate. In contrast, the other form of knowledge identified by Nonaka and Takeuchi (1995), explicit knowledge, is ‘codified’ and can be expressed in words and numbers. However, expressible knowledge represents only the ‘tip of the iceberg’ (Polanyi, 1966), underlining the importance of tacit knowledge for functioning service networks. To address the social character of knowledge creation, Möller and Rajala (2007, p. 903) emphasize a coordinating hub’s capability of “bridging the borders” by being able to understand specialist knowledge domains of the different actors. Moreover, a hub firm has to be a mobilizer for the other network actors. A successful mobilizer is able to guide other actors to a preferred direction and at the same time keep them motivated (Möller & Svahn, 2009). The network actors’ motivation to contribute
is crucially important concerning the operant resource knowledge, since without the actors’ deliberate initiatives to share knowledge, most of the service network’s knowledge base relies on the coordinating hub, leaving much of the network’s learning potential unused (Möller & Rajala, 2007). Möller and Rajala (2007) name this phenomenon ‘hierarchy trap’. Dagnino et al. (2016) conclude that a coordinating hub’s capability to attract and mobilize the needed sets of resources to implement and pursue the underlying vision is of foremost importance in a successful network orchestration.

2.2.3 Relationships
As indicated above, relationships are considered to be especially important operant resources in a service network since they not only provide needed operant and operand resources but also are operant resource themselves. Even though relationships are regarded to be operant resources, it is argued that enhancing them to depict a distinct but interlinked domain of service network orchestration is justified due to their outstanding importance. Accordingly, Håkansson (1987, p. 67) states that a company’s relationships “are one of the most valuable resources that a company possesses”. Moreover, the service logic in marketing is described to be inherently relational since it regards marketing as a continuous series of social and economic processes (Vargo & Lusch, 2004). Thus, Ballantyne and Varey (2006) describe that relationships are always present when there is an interaction between two or more actors, and the quality of a relationship is derived from those interactions. Therefore, when applied to a service network orchestration context, it is the quality of the relationships that can be orchestrated, not the relationship itself. Consequently, a coordinating hub’s ability to create and maintain high-quality relationships can be described as a core competence (cf. Ritter et al., 2004). Thereby, a business relationship is argued to be good, if it successfully fulfills the requirements of the business environment and the involved parties (Cooper & Gardner, 1993). Thus, the term ‘high-quality relationship’ is not necessarily a synonym for a dense or strong relationship. Several business network researchers describe burdens of too many, too close relationships within a network (e.g. Håkansson & Snehota, 1998) and advise network actors to designedly use differences between weak and strong ties within business networks (Gadde & Snehota, 2000; Uzzi, 1997). Consequently, it is argued that it is an important capability of a coordinating hub to create and maintain high-quality relationships with varying degrees of density, depending on respective context.

There are several activities that a coordinating hub can take in order to improve the quality of the relationships within the service network. Engagement activities such as developing a shared vision and shared goals and facilitating interaction are described to improve the actors’ perceived ‘rightness’ of participation in the network (Paquin & Howard-Grenville, 2013; Wry et al., 2011).
Moreover, connecting activities (e.g. strategically deepening relationships) facilitate knowledge flows and collective learning within the service network (Paquin & Howard-Grenville, 2013), leading to an enhanced exchange and integration of operant resources. Additionally, co-development activities such as the above-described joint strategizing and structuring processes are described to build trust and increase willingness to contribution among network actors (Paquin & Howard-Grenville, 2013). Furthermore, Hakanen and Jaakkola (2012) underline the importance of rapport among network actors, meaning the mutual understanding of resources, capabilities and roles within the network, as a key factor in successful service networks. To accomplish this, Hakanen and Jaakkola (2012) propose “a collaborative, integrative management approach”.

Moreover, in order to build and maintain high-quality relationships within the service network, the role of communication is emphasized, which “can be defined […] as the formal as well as informal sharing of meaningful and timely information” (Anderson & Narus, 1990, p. 44). Correspondingly, Bleeke and Ernst (1993, p. 16) state that “the most carefully designed relationship will crumble without good, frequent communication”. In a network orchestration context, Lorenzoni and Baden-Fuller (1995) argue that the main responsibility of communicating within the network lies upon the hub firm. Good communication within networks is described as leading to mutual support (Mohr et al., 1996), enhancing trust and commitment (Morgan & Hunt, 1994) and developing joint problem solving capabilities (Uzzi, 1997), thus increasing the quality of the relationships. Consequently, the coordinating hub needs to establish an integrated communication structure that ensures that the right (relevant and reliable) information is made available for the right actors whenever needed (Morgan & Hunt, 1994; Ritter et al., 2004).

2.2.4 (Institutionalized) Rules

Paquin and Howard-Grenville (2013) describe that a hub firm can influence its network by developing common goals, values and rules, which creates internal network legitimacy (cf. Provan & Kenis, 2007). This is especially important in a service network context because if the service network interactions are not perceived to be legitimized, network actors are likely to drop out of the network or to significantly reduce their contributions (e.g. ideas, knowledge), leaving the coordinating hub in the earlier-mentioned ‘hierarchy trap’ (Möller & Rajala, 2007; Provan & Kenis, 2007). Subsequently, in order to orchestrate a functional service network, a coordinating hub needs to engage in sensemaking (Paquin & Howard-Grenville, 2013) to convince the other network actors of the network activities’ rightness (i.e. legitimacy) (Provan & Kenis, 2007). Wry et al. (2011) posit that a clear-defined collective identity fosters the perceived rightness of the network interactions as well as increases the quality of the network partnership. Consequently, a coordinating hub has to promote the joint development of “a common culture made of values,
norms, customs, and rules” and determine a common goal with its partnering firms (Saz-Carranza et al., 2008 p. 14). In accordance, Vargo and Lusch (2016, p. 11) describe that “humanly devised rules, norms, and beliefs”, which they name ‘institutions’ and in assembled form ‘institutional arrangements’, “enable and constrain action and make social life […] meaningful”.

Lipparini et al. (2014, p. 593) found that developing a strong shared identity and commonly accepted (i.e. institutionalized) rules help firms to trust other network actors and, hence, to perceive networks as ‘safe places’, “where ideas and knowledge can be exchanged” and where the risk for opportunistic behavior is reduced. Thus, trust, which McEvily et al. (2003, p. 92) define as “the willingness to accept vulnerability based on positive expectations about another’s intentions or behaviors”, appears to be a vital aspect to orchestrated service networks. In accordance, the general business network literature (cf. Morgan & Hunt, 1994; Uzzi, 1997) as well as the specific business network orchestration literature (e.g. Lorenzoni & Baden-Fuller, 1995; Möller & Rajala, 2007) describe trust as critical to network success and sustainability. Nonetheless, Provan and Kenis (2007) disagree with that perception in regards to orchestrated networks. Even though Provan and Kenis (2007) acknowledge the importance of trust for networks, which are governed by more than one firm (‘shared governance’), they claim that networks orchestrated by one firm (i.e. coordinating hub), in which a low level of trust is apparent, still can be effective and successful. In contrast, the service marketing literature underlines the importance of trust especially in regards to collective learning and relationship building (e.g. Ballantyne & Varey, 2006), which are considered to be essential features of service networks.

2.2.5 Interrelated nature of domains

As illustrated above, the proposed model of service network orchestration consists of four domains (i.e. Hub coordination, Resources, Relationships and (Institutionalized) Rules). These domains of service network orchestration are highly interrelated. In a service network context, a network’s relationships are considered to be part of the network’s operant resources (cf. Vargo & Lusch, 2016). On the other hand, relationships are identified as essential for accessing (operant and operand) resources (e.g. Håkansson & Snehota, 1989). In order to access the especially important operant resources (e.g. knowledge), a coordinating hub needs to motivate other network actors to contribute through legitimizing the service network interactions (Möller & Rajala, 2007; Paquin & Howard-Grenville, 2013) by basing the network’s relationships on collectively developed institutionalized rules, such as a common culture with shared goals, values and beliefs (Paquin & Howard-Grenville, 2013; Saz-Carranza et al., 2008). Finally, the domain hub coordination, which forms the center of the model, is responsible for acquiring and improving the needed collection of resources (among them being relationships) and by deriving and jointly implementing
(institutionalized) rules. An overview of the domains as well as their respective conceptual definitions is presented in Table 1.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Conceptual Definition</th>
<th>Publications</th>
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<tbody>
<tr>
<td>Hub Coordination</td>
<td>Exerted by firm at center of service network (i.e. coordinating hub) to create service in collaboration with its network partners by acquiring, integrating and transforming resources.</td>
<td>Dhanaraj &amp; Parkhe (2006); Huxham &amp; Vangen (2000); Paquin &amp; Howard-Grenville (2013); Vargo &amp; Lusch (2016)</td>
</tr>
<tr>
<td>Resources</td>
<td>Tangible and intangible properties, which are acquired by coordinating hub and jointly integrated and transformed by network actors to create service. Thereby, operant resources (e.g. relationships, network actors and knowledge) are regarded as primary.</td>
<td>Ballantyne &amp; Varey (2006); Dagnino et al. (2016); Lorenzoni &amp; Lipparini (1999); Möller &amp; Rajala (2007); Vargo &amp; Lusch (2004)</td>
</tr>
<tr>
<td>Relationships</td>
<td>Operant resources of utmost importance, which occur whenever social and economic interactions take place and which can provide access to operand and other operant resources in possession of other network actors.</td>
<td>Ballantyne &amp; Varey (2006); Paquin &amp; Howard-Grenville (2013); Ritter et al. (2004); Vargo &amp; Lusch (2004); Lusch &amp; Vargo (2014)</td>
</tr>
<tr>
<td>(Institutionalized) Rules</td>
<td>Common beliefs of network actors about what goals, values, norms and actions are considered to be right or wrong and important or unimportant. Lead to network legitimacy (i.e. perceived ‘rightness’ of network activities) and enhanced trust.</td>
<td>Lipparini et al. (2014); Lorenzoni &amp; Baden-Fuller (1995); Paquin &amp; Howard-Grenville (2013); Saz-Carranza et al. (2008); Vargo &amp; Lusch (2016)</td>
</tr>
</tbody>
</table>

Table 1: Domains of service network orchestration and their respective conceptual definitions
3. Research Methodology

3.1 Research design

The purpose of this study is to research how the two state-owned companies SJ and DB Fernverkehr, which are facing increased competition in their respective markets, act as coordinating hubs in order to create (enhanced) service. Thus, the following research question is formulated:

*How are service networks orchestrated by coordinating hubs?*

As previously described, service network orchestration is a relatively unexplored field. Nevertheless, it is of significant academic interest and was even selected by the international service research community as being one of the twelve current research priorities (Ostrom et al., 2015). Moreover, this study’s empirical context of SJ and DB Fernverkehr, addressing increased competition by enhancing their service orientation and acting as coordinating hubs in service networks, is highly contemporary. Saunders et al. (2009, p. 139) describe exploratory studies as beneficial for finding out “what is happening” and “to seek new insights”. Hence, exploratory research is a preferred research approach when trying to gain new knowledge about a phenomenon and when researching something that is currently happening (Ghauri & Grønhaug, 2010) since it allows the development of clearer concepts and the establishment of research priorities in an area of interest (Cooper & Schindler, 2011). Therefore, an exploratory research design was evaluated as being the most appropriate for this study’s research question and purpose.

As the initial step of this study, existing literature was reviewed which allowed the identification and synthesis of relevant theories and ideas (cf. Saunders et al., 2009). Subsequently, a novel service network orchestration model was derived which depicts the foundation of the empirical data collection. Moreover, the proposed model is evaluated regarding its applicability in practice by using the empirically collected data. Hence, a deductive approach is employed (cf. Saunders et al., 2009), which is described to allow the evaluation of already existing theory (cf. Bryman & Bell, 2011; Saunders et al., 2009). In order to do so, this study employs a multiple case study research strategy. As outlined by Farquhar (2012), case studies are ideal for studying phenomena in a contemporary context. Additionally, case studies are particularly useful when researchers aim to answer the questions ‘how’ and ‘why’ something happens (Yin, 2009), and when researching topics that are challenging to study outside of its natural environment (Ghauri & Grønhaug, 2010). Accordingly, Halinen and Tömroos (2005, p. 1286) conclude that “it is obvious that case strategy is most suitable for the study of business networks”. 

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Yin (2009) describes that most multiple case designs tend to be stronger than single-case designs. Accordingly, Eisenhardt and Graebner (2007) reason that a multiple case study design presents a stronger basis for theory creation and development, while also facilitating broader research and analysis of outlined research questions. On a similar note, a multiple case study design allows researchers to explore, if findings are present in more than one studied case (cf. Eisenhardt, 1991), which Yin (2009) names replication. Johnston et al. (1999) conclude that if replication is found, the confidence in the overall results will be increased. However, in this context it should be noted that the present study does not aim at finding the single “truth” (cf. Gioia & Pitre, 1990). Instead, gaining a comprehensive understanding of the complex, real-life phenomenon service network orchestration is targeted. Salonen and Jaakkola (2015) describe that selecting case companies, which represent opposites regarding a relevant matter, provides a study with maximum variation, which is especially beneficial when aiming to gain a holistic understanding of a matter. Therefore, a multiple case study approach consisting of two cases, which significantly differ regarding their ways of functioning, was deemed as an appropriate research design for this study.

3.2 Case selection

In order to investigate this paper’s research question, the passenger ground transportation industry in general and the railway companies SJ and DB with its long-distance subsidiary DB Fernverkehr in specific were found to be a suitable empirical setting. SJ and DB are in many respects similar: both companies are the state-owned, national railway company of their respective country and, therefore, are obliged to follow certain regulations connected to their public character (e.g. regarding fulfilling financial targets determined by the state). Moreover, since relatively recently both companies have encountered increased competition due to market liberalizations of varying natures (Frankfurter Allgemeine Zeitung, 2012; Svenska Dagbladet, 2013). Another similarity between SJ and DB is that both companies attain rather low customer satisfaction values (Spiegel, 2015a; Svenskt Kvalitetsindex, 2015), which enhances the threat resulting from the newly arisen competition. Finally, as indicated above, both companies are expanding their service offerings in order to address the newly competitive market environment. However, despite all the similarities, SJ and DB have differing ways of functioning. In 2000, SJ’s predecessor Statens Järnvägar was divided into six independent organizations and SJ was given the responsibility for the passenger train operations, while, for instance, Jernhusen and Trafikverket manage the station and track infrastructure (SJ, 2016a). Thus, nowadays SJ is solely focused on operating passenger trains while closely working with independent organizations to deliver its railway service. In contrast, DB is conducting most of the tasks connected to its railway operations in-house. For instance, the track and station management as well as the train management and the development of IT
solutions is conducted by distinct DB subsidiaries (DB Annual Report, 2013). Hence, DB’s long-distance subsidiary DB Fernverkehr is working with various internal actors when providing its railway service. The case companies’ differing ways of functioning are also mirrored in the companies’ amount of employees: while SJ employs 5,000 people, DB has 300,000 employees. For more detailed company descriptions see Appendix I.

Therefore, in terms of the companies’ ways of functioning, SJ and DB depict divergent cases. Consequently, the opportunity to investigate the differing cases allows to greatly enhance the understanding of service network orchestration activities conducted by coordinating hubs in different contexts (cf. Eisenhardt & Graebner, 2007; Salonen & Jaakkola, 2015). This is especially intriguing since the companies’ differing ways of functioning are directly connected to their network orchestration activities. While SJ is solely working with external service network partners, DB Fernverkehr’s service network consists of external as well as internal partners, which require distinct hub coordination activities to be orchestrated. To conclude, the case selection for the present study was purposeful and derived from the aim of gaining as comprehensive insights as possible on the complex and contemporary phenomenon of service network orchestration, rather than targeting representative results in terms of population (cf. Eisenhardt & Graebner, 2007; Salonen & Jaakkola, 2015). However, it should be noted that the case selection was also influenced by the authors’ pre-existing connections to one of the companies, which provided the authors with initial access and information.

3.3 Data collection

SJ and DB Fernverkehr were identified as coordinating hubs engaging in service network orchestration in order to address the increased competitiveness in their respective markets. In line with Healey and Rawlinson’s (1993) suggestion of talking to informed individuals and scanning existing data when seeking case studies, the case identification was done by engaging in discussions with industry experts and examining secondary data, which were available due to the authors’ previous connection to DB Fernverkehr. As a result, SJ and DB Fernverkehr were chosen as the starting point for this study. Accordingly, the data collection process started at these companies and was then extended to some of the companies’ partner firms by utilizing a snowball sampling approach (cf. Saunders et al., 2009). Even though this study’s focus lies on SJ and DB Fernverkehr, it was regarded to be important for this study’s purpose to not only collect data from the perspective of the coordinating hubs but also to include the perspective of the orchestrated partnering firms since this allows a more holistic approach addressing the networked character of service creation (cf. Healey & Rawlinson, 1993; Jaakkola & Hakanen, 2012). The utilized
The snowball sampling method allowed the detection of particularly interesting aspects and partner firms involved in SJ’s and DB Fernverkehrs’s service networks, which then could be examined in more depth (cf. Saunders et al., 2009).

Yin (2009) describes the essential characteristic of case study research as consisting of several different sources of data, which strengthens the research findings. Thereby, the sources of data can be primary as well as secondary in nature (Yin, 2009). As indicated above, secondary data was used to identify a beneficial case setting. Moreover, secondary data, such as the investigated companies’ press releases and annual reports as well as general press publications and industry reports, was used throughout the whole process of the study in order to gain deeper insights into the context. A qualitative approach in form of semi-structured interviews was used as the source for the primary data utilized by this study (cf. Bryman & Bell, 2011; Saunders et al., 2009). As suggested by Churchill (1979), this approach was chosen as an appropriate research tool, which was derived from theory in the sense that the literature review (cf. Chapter 2) was used to specify the utilized constructs in the primary data collection.

Mirroring the explorative nature of this study, a non-standardized, semi-structured interview approach was chosen as this allows interviewers to determine certain sets of themes and questions that the interview could address while still maintaining the advantages of unstructured interviews (i.e. the potential for the discovery of new and intriguing aspects) (Ghauri & Gronhaug, 2010; Saunders et al., 2009). Therefore, semi-structured interviews are described to be beneficial when exploring new topics (Healey & Rawlinson, 1993; Saunders et al., 2009), which is argued to be important for the highly contemporary phenomenon service network orchestration. In order to conduct the interviews, an interview framework (cf. Appendix II) consisting of themes and open questions was developed by operationalizing (i.e. ‘translating’ to a less academic level) the proposed model of service network orchestration (cf. Chapter 2). By strongly basing the data collection on theoretical concepts, the concern that the data collection within case study research is often based on subjective judgments (Yin, 2009) is addressed, simultaneously expanding this study’s construct validity. Since the quality of answers in the non-standardized interviews is depending as much on the phrasing of the questions as on the ability of the interviewer to engage respondents in a relevant discussion, Healey and Rawlinson (1993) suggest conducting pilot studies in order to develop the skills of the interviewers as well as testing the understandability of the questions. In accordance, a pilot study with two industry experts, who due to their position or scope of tasks did not qualify for the actual data collection, was conducted. Based on this, the skills of the interviewers were improved and the interview framework was finalized. The
operationalization of the theoretical service network orchestration model with derived interview themes and questions is presented in Table 2.

In line with the approach chosen for identifying partner firms of SJ and DB Fernverkehr, a snowball sampling approach (cf. Saunders et al., 2009) was utilized for the identification of interview respondents. Also here SJ and DB Fernverkehr were the starting point. In both companies a few initial interviews were scheduled and in regards to especially intriguing aspects of the interview, the respondents were asked, which colleagues could be suitable for further interviews. In total, sixteen interviews were conducted. While most of the respondents work in the marketing department of their respective firms, all of them have significant expertise in the field of service creation within a network setting. Most of the respondents have top and middle management positions. However, the positions of some of the respondents are rather operational, which is described to increase the diversity of perspectives on the phenomenon (Eisenhardt & Graebner, 2007) and is therefore considered to be beneficial for an in-depth understanding of service network orchestration. Thereby, the respondents did not see the necessity of anonymizing their names or positions. Moreover, this study only utilizes data of which the respondents confirmed that it can be published. Hence, ethical concerns are considered and addressed by this study (cf. Saunders, 2009). The interview respondents as well as their respective firms and positions are presented in Table 3.
<table>
<thead>
<tr>
<th>Theme</th>
<th>Domain</th>
<th>Conceptual Definition</th>
<th>Operationalized Questions</th>
<th>Example</th>
<th>Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 2: Operationalization of four domains of service network orchestration</td>
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</tr>
</tbody>
</table>

- **Domain:** Knowledge
  - Conceptual Definition: The extent to which network orchestration is guided by knowledge and expertise.
  - Operationalized Questions:
    1. How do you integrate knowledge into network orchestration processes?
    2. What is the role of expertise in network orchestration?
  - Example: How do you prioritize tasks based on knowledge?
  - Publications: (2000) Vago & Lanza

- **Domain:** Resources
  - Conceptual Definition: The availability and management of network resources.
  - Operationalized Questions:
    1. What is the extent of resource allocation in network orchestration?
    2. How do you manage resources during network orchestration?
  - Example: What methods are used to optimize resource allocation?
  - Publications: (2000) Vago & Lanza

- **Domain:** Processes
  - Conceptual Definition: The steps and procedures involved in network orchestration.
  - Operationalized Questions:
    1. What is the process for initiating network orchestration?
    2. How do you ensure process efficiency in network orchestration?
  - Example: What is the sequence of steps for initiating network orchestration?
  - Publications: (2010) Vago & Lanza

- **Domain:** Hub Coordinators
  - Conceptual Definition: The coordination and management of network orchestration.
  - Operationalized Questions:
    1. What is the role of hub coordinators in network orchestration?
    2. How do hub coordinators facilitate network orchestration?
  - Example: How do you identify key coordinators in network orchestration?
  - Publications: (2000) Vago & Lanza

- **Domain:** Communication
  - Conceptual Definition: The effective exchange of information between network entities.
  - Operationalized Questions:
    1. How do you facilitate effective communication during network orchestration?
    2. What strategies are used to enhance communication in network orchestration?
  - Example: What tools are used to support communication in network orchestration?
  - Publications: (2000) Vago & Lanza

- **Domain:** Network Culture
  - Conceptual Definition: The shared values and norms that influence network orchestration.
  - Operationalized Questions:
    1. How do network culture values influence network orchestration?
    2. What are the key cultural factors impacting network orchestration?
  - Example: How do you align network culture with operational goals?
  - Publications: (2010) Vago & Lanza
The interviews were conducted in March and April 2016 both face-to-face as well as via telephone, depending on the geographic location of the interview respondents. Moreover, some interviews were conducted in English, while other interviews were conducted in German due to the respondents’ request. While interviewing respondents in their mother tongue (i.e. German) bears the advantage to avoid possible restrictions regarding the linguistic expressions (cf. Marschan-Piekkari & Welch, 2004), a clear disadvantage is that only one of the authors could conduct the interviews in German. Therefore, the exchange of impressions and perceptions of how (e.g. in which tone) the answers were given in the interview situation could not be exchanged. Moreover, it needs to be noted that the above-mentioned previous connection of one of the authors to DB Fernverkehr and to some of the respective respondents could lead to partly biased results as well as to an imbalance of the collected data. All of the interviews lasted between 30 and 60 minutes and the above-described interview framework (cf. Appendix II) was used. However, as typical for semi-structured interviews, not all of the themes and questions in the interview framework were discussed in an equal depth and in the same order within each interview. This was determined by the flow of the conversation. Moreover, additional questions, which were developed in the process of the interview and initially were not included in the interview framework, were asked if it was found that they were beneficial for investigating this study’s research question (cf. Saunders et al., 2009).
### Table 3: Interview respondents

<table>
<thead>
<tr>
<th>Organization</th>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJ and Affiliates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SJ</td>
<td>Sofia Edholm</td>
<td>Head of Customer Intelligence and Loyalty</td>
</tr>
<tr>
<td>SJ</td>
<td>Claes Lindholtz</td>
<td>Head of Business Development</td>
</tr>
<tr>
<td>SJ</td>
<td>Daniel Rafā√</td>
<td>Manager of Infrastructure Partnerships</td>
</tr>
<tr>
<td>SJ</td>
<td>Bjarni Skipper</td>
<td>Head of Traffic and Fleet Design</td>
</tr>
<tr>
<td>SJ</td>
<td>Olivia Svensson</td>
<td>Manager of CRM Partners and Campaigns</td>
</tr>
<tr>
<td>Jernhusen</td>
<td>Olof Kjellström</td>
<td>Corporate Strategist</td>
</tr>
<tr>
<td>SEKO</td>
<td>Per-Ola Fällman</td>
<td>Public Advocate</td>
</tr>
<tr>
<td>DB and Affiliates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DB Fernverkehr</td>
<td>Cornelia Gaumann</td>
<td>Product Manager Customer Services</td>
</tr>
<tr>
<td>DB Fernverkehr</td>
<td>Miriam Grafflage</td>
<td>Head of Product Control and Quality of long-distance Trains</td>
</tr>
<tr>
<td>DB Fernverkehr</td>
<td>Karsten Kemeter</td>
<td>Head of Product Management of long-distance Trains</td>
</tr>
<tr>
<td>DB Fernverkehr</td>
<td>Vanessa Rommel</td>
<td>Product Manager Customer Experience and Onboard Quality</td>
</tr>
<tr>
<td>DB Fernverkehr</td>
<td>Daniela Steens</td>
<td>Head of Product Strategy</td>
</tr>
<tr>
<td>DB Fernverkehr</td>
<td>Robert Willers</td>
<td>Head of Customer Loyalty Programs</td>
</tr>
<tr>
<td>DB Regio</td>
<td>Philipp Kühn</td>
<td>Customer and Product Marketing</td>
</tr>
<tr>
<td>DB Project Traveler Information</td>
<td>Jasmin Bungert</td>
<td>Senior Manager Project Traveler Information</td>
</tr>
<tr>
<td>LSG Sky Chiefs</td>
<td>Carina Hecher</td>
<td>Key Account Manager Train Division</td>
</tr>
</tbody>
</table>

### 3.4 Data analysis

Spiggle (1994, p. 492) describes that researchers “dissect, reduce, sort, and reconstitute data” through analytical operations, which in turn allows to extract meaning and to arrive at conclusions. In order to analyze the collected data, the interviews were audio-recorded and, subsequently, partly transcribed as suggested by Saunders et al. (2009). Moreover, notes were taken during the interviews, which contained the authors’ perception of especially important interview parts. After the interviews the authors exchanged their perceptions and jointly determined which parts to transcribe. In this context it needs to be mentioned that this procedure was not possible regarding the interviews conducted in German. In this case only one author determined which parts to translate and transcribe. However, to still enable an exchange about the research findings, the
German interviews were more extensively transcribed than the ones conducted in English. When transcribing, the audio-records as well as the notes were used in order to not only capture the exact spoken words but also to include indications about in which tone the responses were voiced, and, in the case of face-to-face interviews, about the non-verbal communication of the respondents.

As suggested by Yin (2009), the previously discussed interview framework (cf. Appendix II), which was derived from the proposed model of service network orchestration, was used to organize and direct the initial data analysis. Based on that, provisional main themes and components were predicted which were used as a starting point for the categorizing of the data (cf. Spiggle, 1994). Saunders et al. (2009) define the categorization of data as attaching units of data to appropriate categories based on the identification of recurring patterns, themes and relationships. Hence, categorization involves giving labels to instances of data (Spiggle, 1994). During the process of data collection, the initial categorization evolved naturally and some categories were revised, while others were added. This was done by comparisons regarding what kind of answers had been most prominent throughout the process of data collection (cf. Spiggle, 1994). While the comparison process initially occurred rather implicitly, a more systematic approach was taken as the data analysis proceeded. Overall, as advocated by Spiggle (1994), the data analysis process was a systematic back-and-forth movement through the data. Finally, the data categorization became more hierarchical and increasingly depicted analytical linkages between the data.

Two main categories were found to entail distinct hub coordination activities in regards to the four interlinked domains of service network orchestration constituting the proposed model (cf. 2.1 and 2.2), which are 1) the partner firm’s proximity to the coordinating hub and 2) the degree of coordinating hub involvement in the partnership. The first category and its differentiation in internal and external service network partner firms directly results from the case companies’ differing ways of functioning. Regarding the second category and its distinction between a low and a high degree of coordinating hub involvement in the partnership, it was found that the coordinating hubs SJ and DB Fernverkehr are intentionally allocating their involvement in partnerships with different partner firms. As described in 2.2.3, this is in accordance with business network researchers who advocate a variety of strong and weak ties within a business network (e.g. Gadde & Snehota, 2000; Uzzi, 1997).

The two main categories were found to provide contexts, which require distinct hub coordination activities. Those activities are presented in a 4-field matrix in Figure 2 and are elaborated on in the following. Firstly, in internal partnerships that are characterized by a low coordinating hub
involvement, the coordinating hub is delegating its fellow subsidiaries in order to provide service. This is comparable to headquarters that are delegating their subsidiaries by engaging in coordination and monitoring activities as described by Alfodi et al. (2012). Secondly, while internal network actors (i.e. fellow subsidiaries) depict circumstances that a coordinating hub usually cannot change, it has more freedom regarding the selection of external partner firms. Hence, in external partnerships that are characterized by a low coordinating hub involvement the coordinating hub is assembling in order to unite desired resources for its service provision, which is in accordance with Paquin and Howard-Grenville (2013, p. 1225) who investigate “intentionally assembled interorganizational networks”. Thirdly, by getting involved in internal partnerships to a high degree the coordinating hub aims at enabling its internal partner firms to co-develop, which is described by Brodie et al. (2011) in a consumer-company context. Hence, in internal partnerships that include a high degree of coordinating hub involvement the coordinating hub is co-developing with its internal network partners to further expand or refine the existing service offering. Lastly, in contrast to co-developing, which builds on an existing organizational foundation, in external partnerships that are characterized by a high degree of coordinating hub involvement the coordinating hub and the external partner firm are jointly co-creating (cf. Jaakkola & Hakanen, 2012; Vargo & Lusch, 2008) an extensive partnership and a resulting service ‘from the scratch’. Overall, this categorization, which will be applied to the theoretically derived domains of service network orchestration in the following chapter, is deemed to be a clear and stable foundation for the presentation as well as discussion of this study’s research findings (cf. Saunders et al., 2009).

Figure 2: Identified hub coordination activities
4. Findings

The collected data confirmed that the orchestration of service networks is a highly relevant phenomenon in today’s business world. Moreover, the respondents commonly appraised that service networks will become even more important in the future. Accordingly, it was found that both case companies are acting as coordinating hubs in their respective service networks by conducting distinct hub coordination activities. In order to present this study’s findings the companies’ differing ways of functioning are firstly explained and the resulting service networks of the case companies are presented. In the following, the previously identified hub coordination activities conducted by the coordinating hubs in different contexts, which are dependent on the partner firm’s proximity to the coordinating hub and the coordinating hub’s involvement in the partnership (cf. Figure 2), are elaborated on. These activities are then analyzed through the lens of the proposed service network orchestration model (cf. Figure 1) to investigate the distinct hub coordination activities in connection to the three interlinked domains Resources, Relationships and (Institutionalized) Rules.

4.1 External service network: case SJ

Since Statens Järnvägar’s decommissioning in 2001, SJ has been solely responsible for operating passenger trains, while, for instance, Trafikverket manages the railway tracks and Jernhusen manages the train stations and depots. Hence, when creating service for its customers, SJ needs to work closely with various external organizations that have the needed competencies, among which Trafikverket and Jernhusen are described to be the most important ones. Claes Lindholtz, SJ’s head of business development, described “It is quite an interesting situation: if you are at the train station, you are in Jernhusen’s land; if you are at the platform waiting for the train, you are in Trafikverket’s land and once you board the train, you enter SJ’s land”. While this system was introduced to be more cost efficient, there are critical voices against it. For instance, Per-Ola Fällman, who is a public advocate working for the Service and Communication Employees’ Union SEKO, stated “Since 2001, the costs have increased and not decreased as promised. [...] Moreover, a holistic perspective on the industry and a customer focus were lost.” Along with the partners, who used to be organized within Statens Järnvägar, SJ is also working with other external firms to create service. The partners for the loyalty program ‘SJ Prio’, such as the hotel chains Scandic and First Hotels, or firms providing on-board entertainment, such as Spotify and C More, can be named as examples. Therefore, SJ is solely working with external network actors to create service. By doing so, SJ chooses to what degree it gets involved into the different partnerships. For instance, while SJ’s involvement in the central partnerships with Jernhusen and Trafikverket naturally is high, the company is significantly less involved with some of its SJ Prio partners. For a
visualization of SJ’s service network, see Figure 3, which is meant to be illustrative rather than exhaustive. Moreover, a short description of SJ’s partner firms can be found in Appendix III.

4.2 Combined service network: case DB Fernverkehr

In contrast to SJ, DB Fernverkehr works with both internal as well as external partner firms since the DB Group is a rather large corporation with numerous subsidiaries. Along with DB Fernverkehr, which manages the long-distance connections, there is for example DB Regio, which is responsible for regional connections, and DB Vertrieb that sells the tickets for both of the previously named DB subsidiaries. Moreover, there are various other bigger and smaller DB companies, which are specialized in diverse areas such as addressing customer requests (DB Dialog). Additionally, a corporate regulation determines that a DB subsidiary has to choose another DB subsidiary over an external actor, if the fellow subsidiary can offer the desired task or service. Even though they belong to the same corporation, the DB subsidiaries did not work together beyond a necessary degree in the past and hence, similarly as in Sweden, a holistic perspective of the market was arguably neglected. However, a more cooperative culture within DB Group is currently implemented by launching cross-subsidiary projects, which facilitate exchange between the distinct DB subsidiaries. Moreover, similarly to SJ, DB Fernverkehr has various
external partner firms such as LSG Sky Chefs, which conducts the catering service on some of DB Fernverkehr’s lines. Further, also DB Fernverkehr chooses to get involved in its internal as well as external partnerships to varying degrees. For DB Fernverkehr’s combined service network, which is not aimed at being exhaustive either, see Figure 4. Moreover, a description of the internal and external partner firms can be found in Appendix III.

4.3 Hub coordination activities

Both case companies are aiming to provide their customers with a holistic mobility service. Thereby, the case companies cannot create all of the components of this service by themselves. Hence, the respondents underlined the importance of business networks for going beyond the own company’s core competencies. Cornelia Gaumann, DB Fernverkehr’s product manager for customer services, described “We choose partner firms that ensure that we can offer our customers an integrated mobility service. Hence, we have many partner firms that fill gaps that we cannot fill ourselves”. While orchestrating the service networks consisting of companies that possess desired core competencies, the case companies were found to conduct distinct hub coordination activities depending on the respective context of the interaction. Thereby, the partner
firm’s proximity to the coordinating hub as well as the intensity of the coordinating hub’s involvement in the cooperation were found to be important differentiators. Subsequently, as presented in Figure 2, the following hub coordination activities were identified: Delegating, Assembling, Co-developing and Co-creating. These hub coordination activities are discussed in more detail in the following.

4.3.1 Delegating
A coordinating hub was found to delegate in the context of an internal network partner and a low degree of coordinating hub involvement. Hence, this coordinating hub activity only applies to the case company DB Fernverkehr. Thereby, DB Fernverkehr and the internal partner firms share the corporate vision by default. However, Miriam Grafflage, DB Fernverkehr’s head of product controlling and quality, described “The corporate vision to jointly provide mobility service from door to door is relatively new and not fully implemented yet, but still somehow present”. Since the overall corporate vision is not entirely adopted within DB Group, the different DB subsidiaries remain having their independent visions. Hence, a joint vision exists only to a limited extent. However, when delegating, a strong joint vision is not viewed as being necessarily indispensable. Instead, clearly defined tasks and targets and a shared understanding of those and the involved processes were described to be more important. Thereby, the targets as well as the overall strategy of the cooperation are determined and then delegated by the coordinating hub rather than jointly developed. In that regards, Daniela Steens, head of DB Fernverkehr’s product strategy, exemplified “DB Dialog is an internal firm that answers customer requests on various channels for us and receives money in return. From the beginning on, we have clearly defined what they can and cannot do”.

4.3.2 Assembling
Assembling was found to be conducted by a coordinating hub in regards to an external network partner and a low degree of coordinating hub involvement in the cooperation. While, as described above, DB Fernverkehr is obliged to delegate the needed tasks or services to fellow subsidiaries if they can make appropriate offers, external partners can be assembled more freely. However, it needs to be mentioned that also in regards to external partner firms certain state or corporate regulations can have limiting effects. Different to internal partner firms, external partners do not share a corporate vision. Concerning that, Bjarni Skipper, SJ’s head of traffic and fleet design, exemplified regarding SJ’s cooperation with the different local public transportation authorities (Regionala kollektivtrafikmyndigheten (RKM)) “Each of the local authorities has its own vision and we as SJ have our vision and, of course, we cooperate to create as attractive services as possible but I would not call that a common vision”. Thus, when assembling the coordinating hub
has the fulfillment of a task in its focus. Accordingly, it sets the targets and strategy of the cooperation. While the goals and contents of the partnership are laid down in contracts between both internal and external network partners, in regards to external partner firms the coordinating hub tends to establish more strict performance measures. Thereby, service level agreements (SLAs), which define the level of service expected from the partnership, as well as key performance indicators (KPIs), which are utilized to evaluate the overall success of the external partnership, are commonly used.

4.3.3 Co-Developing

A coordinating hub is co-developing in the context of an internal partner firm and a high degree of coordinating hub involvement. Thus, this coordinating hub activity can only be found in the case of DB Fernverkehr. Even though, the DB Group’s vision is not yet fully implemented, when co-developing the coordinating hub and the other involved subsidiaries extend and specify this vision to the area of working together. Hence, a shared vision is co-developed from the corporate vision under the leadership of the coordinating hub. Regarding this, Miriam Grafflage, DB Fernverkehr’s head of product controlling and quality, described “One of the central customer needs while using our mobility service is to be holistically informed at all times. To address this need, the ‘Project Traveler Information’ consisting of and working with employees from different DB subsidiaries is now in charge of a cross-subsidiary provision of timely and high-quality information”. Along with the vision, also the cooperation’s strategy is co-developed by the coordinating hub and the other involved subsidiaries, which is described to be due to the complexity, criticality and/or centrality of the cooperation’s content. Jasmin Bungert, senior manager at the Project Traveler Information, exemplifies “Providing holistic traveler information is very complex due to numerous internal systems and we are dependent on the know-how, suggestions and ideas of the representatives of the various DB subsidiaries”. Moreover, contracts with determined performance measures are established between the coordinating hub and the fellow subsidiaries. Nevertheless, Philipp Kühn, customer and marketing manager at DB Regio, described them to be “rather generally formulated and leaving some room for interpretation”.

4.3.4 Co-Creating

Co-creating was found to be conducted by the coordinating hub in regards to external network partners and a high degree of coordinating hub involvement in the cooperation. Similarly to co-developing, co-creating was described to be employed by the coordinating hub if the cooperation’s content is characterized by a rather high complexity, criticality and/or centrality. Since the coordinating hub and external partner firms do not share a corporate vision, a joint vision and strategy development takes place from the scratch. Vanessa Rommel, DB Fernverkehr’s product
manager for customer experiences, exemplified this by describing the relationship to LSG Sky Chefs, which is a company that is conducting the catering on DB Fernverkehr’s new Intercity 2 trains "Within several meetings we talked about DB Fernverkehr’s new customer-centric approach and about underlying factors, such as the planned budget. Then both of us conducted customer analyses and shared the results with each other. Based on that, our joint vision developed. Moreover, after that we determined especially important components which need to be taken care of to realize the vision". A joint vision and strategy development was found to be easier if the coordinating hub and the external partner firm both consider the customers using the service as being shared customers. Regarding that, Claes Lindholtz, head of business development at SJ, described "We are working with C More, so our customers can stream movies during the train ride. We have the shared vision to provide the customers with the best possible streaming service, which was easily implemented since C More has the interest to convince the customers to also use its service at home". Nevertheless, performance measures such as the above-mentioned SLAs and KPIs are clearly and detailedly determined by contracts and regularly reviewed by the coordinating hub.

4.4 Hub coordination activities in connection to domains of service network orchestration

The above-described hub coordination activities employed by a coordinating hub in different partnership contexts influence its conduct in regards to the three remaining domains of service network orchestration, i.e. Resources, Relationships and (Institutionalized) Rules. This is discussed and analyzed in the following.

4.4.1 Resources

Since this study’s case companies are building and maintaining relationships with partner firms that provide desired core competencies for offering their mobility service, the respondents generally emphasized intangible resources more than tangible ones. Thereby, specifically the partner firms’ expertise resulting from their core competencies was described as being a crucial resource exchanged within service networks. In regards to this Sofia Edholm, SJ’s head of customer insights and loyalty, described “Our partners know their business, we know our business and based on that we need to find a way how can we get the partnership to benefit our customers, the partner firms and us”. However, even though intangible resources are identified as being primary in service networks, there is a difference regarding the scope of the exchanged (intangible) resources promoted by the identified hub coordination activities, which will be discussed in the following.
4.4.1.1 Delegating

When delegating the coordinating hub regards intangible resources such as expertise as important in the respect that the internal partner firm can conduct its tasks efficiently and correctly. However, the coordinating hub does not actively foster the exchange of (intangible) resources beyond this due to its low involvement. Hence, a task-orientation becomes apparent, which is confirmed by Karsten Kemeter, head of product management for DB Fernverkehr’s long-distance trains. Kemeter described the distribution of a DB-magazine in the trains, which is done by a DB subsidiary, “To organize the distribution, you set the scene by determining how often the magazines should be distributed and where they should be put, and then this is done. There is not more exchange needed for that”. Since DB companies are obliged to work with fellow subsidiaries if possible and the delegated subsidiaries therefore do not need to fear a termination of a contract in the same degree as external partners have to, it was described that the motivation of internal partner firms to contribute resources is generally more difficult to accomplish. Nevertheless, due to the task-orientation of the cooperation, this was not described to be problematic.

4.4.1.2 Assembling

Similarly to delegating activities, the coordinating hub was found to have a task-orientation when assembling. Concerning this, Robert Willers, head of DB Fernverkehr’s loyalty programs, described “We have some partners that, for instance, sell items we offer in our bonus program, with whom we talked on the phone only once, then created and signed a contract and ever since everything is working fine”. Even though only talking with the external partner firm once is a rather extreme example and not representative for a coordinating hub’s assembling activities, assembling is characterized by a low involvement of the coordinating hub. Consequently, knowledge flows and collective learning are not regarded as being indispensable and are therefore not actively promoted by the coordinating hub. Regarding jointly developing the train timetables with local public transportation authorities through Samtrafiken, Bjarni Skipper, SJ’s head of traffic and fleet design, exemplified “Since the relationships we have with the local authorities are very stable […], not much feedback or ideas are exchanged or need to be exchanged on a regular basis”. Nevertheless, generally external partner firms were described to have a higher motivation to contribute than internal partner firms.

4.4.1.3 Co-Developing

When co-developing, the coordinating hub regards the internal partnership as being crucial for its service network’s success and gets involved to a high degree. Usually co-developing activities have a rather broad scope and are not connected to one specific task, which is mirrored in the
exchange of varied (intangible) resources. Hence, when co-developing the exchange of (intangible) resources such as knowledge, ideas and open feedback, is actively promoted by the coordinating hub. However, as described above, a number of respondents stated that internal partner firms are more challenging to motivate to contribute (intangible) resources than external ones. Regarding this, Cornelia Gaumann, DB Fernverkehr’s product manager for customer services, described “Most of the time, external partners are significantly easier to excite and motivate, and are more willing to contribute time and ideas than internal ones”. The situation is aggravated by the fact that conflicts of interest occasionally become apparent between DB Fernverkehr and other DB subsidiaries. However, when co-developing the coordinating hub tries to emphasize the greater goal of the cooperation. Miriam Grafflage, head of product controlling and quality at DB Fernverkehr, exemplified “There are product and portfolio boards with representatives of DB Fernverkehr, DB Regio and DB Vertrieb, in which projects are jointly prioritized and resources are divided. Those boards are very constructive and the general DB brand is more emphasized than the specific interests of the single entities”.

4.4.1.4 Co-Creating

Similarly as when co-developing, the scope of the cooperation is broader than the fulfillment of a specific task when the coordinating hub gets involved to a high degree and engages in co-creation with an external partner firm. Hence, an intense and frequent (resource) exchange as well as collaborative learning are desired as well as promoted by the coordinating hub. Regarding the benefits of such an approach Olof Kjellström, corporate strategist at Jernhusen, described “SJ needed a depot where a new type of train could be maintained and asked us to build it. However, we also saw the possibility to reconstruct an existing depot. Together with SJ we developed plans how to change the existing depot in the best way. Due to this productivity increased for both parties”. Hence, when co-creating an intense exchange takes place and ideally new knowledge emerges. Vanessa Rommel, DB Fernverkehr’s product manager for customer experiences, exemplified this by describing the relationship to LSG Sky Chefs “LSG contributes expertise concerning catering service, while DB is the expert for railway service in Germany. Based on this we have learnt from each other and finally developed an innovative catering service concept together”. Hence, the partner firm’s motivation to contribute (intangible) resources is essential when co-creating. Even though, as indicated above, external network partners are described to be more easily motivated than internal ones, the coordinating hub actively promotes and maintains the partner firms’ motivation while co-creating. In regards to this Olivia Svensson, SJ’s manager of CRM partners and campaigns, advised “To foster and maintain a partner’s motivation, I keep up a frequent and open communication and meet the partners in person. Moreover, I also defend
and advertise our partnerships within SJ. If a partner firm recognizes that we value the partnership, this also enhances its motivation”.

4.4.2 Relationships
Relationships within service networks were found to be important intangible resources. In addition to the partner firms’ core competencies, which become accessible through relationships, several respondents described that if different partner firms are working together, this can enhance a service network’s creativity and save the coordinating hub’s orchestration capacities. Cornelia Gaumann, who is DB Fernverkehr’s product manager for family services, exemplified “When we created a children’s app the exchange between two of our network partners was very close. They quickly found a common creative language and shared ideas and suggestions. At some point, DB Fernverkehr was only involved when decisions were made and results were presented”. However, in this context it needs to be mentioned that the majority of the interactions within service networks take place between partner firms and the coordinating hub, which is the connector between the various service network actors. Moreover, several respondents underlined that increasing the generality of a partnership’s content as well as adding a future perspective and long-time goals enhances the relationship’s quality. Regarding that, Vanessa Rommel, DB Fernverkehr’s product manager for customer experiences, described “With several of the external partners I am working with, I am currently implementing a more general exchange to find out in which other areas the partnership can be beneficial as well. This is instructive and, simultaneously, increases a partnership’s quality”.

4.4.2.1 Delegating
As described above, when delegating the coordinating hub is task-focused, efficiency-oriented and involved in the partnership to a low degree. Since improving a relationship’s quality is not regarded to enhance the cooperation’s efficiency or task fulfillment, the coordinating hub usually does not take efforts to improve a relationship’s quality when delegating. Hence, no extended long-time goals apart from the continuous execution of the tasks exist. Thereby, a rather clear buyer-provider relationship between the coordination hub and its internal partner firm becomes apparent. Moreover, communication does not take place frequently and usually occurs only when necessary. Karsten Kemeter, DB Fernverkehr’s head of product management for long-distance trains, exemplified regarding the above-mentioned DB-magazine distribution example “After determining the contents of the relationship, not much more communication is needed, except when something goes wrong. Then, of course, you need to talk”. Most respondents described that when the coordinating hub is delegating, the partnerships are proceeding quite easily and uncomplicatedly. Nevertheless, it was mentioned that delegating can become problematic, if the
cooperation bears the potential of being more advantageous but is restricted by the task orientation and low involvement of the coordinating hub. Regarding the customer service subsidiary DB Dialog Daniela Steens, head of product strategy, described that this subsidiary knows much about DB Fernverkehr’s customers but due to the strictly determined ways of working together, some of the relationship’s potential such as the proactive submission of suggestions is not exploited.

4.4.2.2 Assembling
Also when assembling, mostly no efforts are taken by the coordinating hub to improve the relationship’s quality. However, in comparison to delegating assembling activities tend to involve slightly more frequent communication. It was described that this is due to the fact that external partner firms are not connected to the coordinating hub by default. Hence, by keeping up a certain degree of communication the coordinating hub can ensure a desired level of connection to its partner firm. Regarding this, Robert Willers, head of DB Fernverkehr’s loyalty programs, described “Already before we start the external partnership we mostly determine how often we want to meet the partner firm per year, which is also part of the tendering processes we have to conduct due to our character as a public company”. Hence, a rather formal and regulated communication determined by the coordinating hub occurs when assembling, which is less apparent when the coordinating hub is delegating internal partners. However, in this context it needs to be mentioned that even though there is more frequent communication when assembling, a clear buyer-provider distinction becomes mostly apparent, in which the coordinating hub purchases the fulfillment of a task and the external partner is delivering the task.

4.4.2.3 Co-Developing
As indicated above, since relatively recently an increased cooperation between the different DB-subsidiaries has been promoted. Regarding this Daniela Steens, DB Fernverkehr’s head of product strategy, described “In the past, a silo mentality was found within DB: Everyone only cared for her own field of work and no one really looked at the bigger picture. However, this has changed. We have realized that we only can get better if we are talking and working together”. Accordingly, the interaction of different DB subsidiaries is facilitated by different projects such as the yearly event ‘Product Conference’, which took place in 2015 for the first time and was organized by DB Fernverkehr. During the event the subsidiaries DB Fernverkehr, DB Regio, DB Vertrieb and DB’s Project Traveler Information presented their innovations by simulating a holistic customer journey. Thus, the event’s content was co-developed under the leadership of DB Fernverkehr and, simultaneously, the corporate vision was brought to life. By doing so a cross-subsidiary understanding of each other’s tasks and limitations was promoted. Therefore, when co-developing the coordinating hub makes efforts to deepen and improve the quality of the
relationships to its internal partner firms. Moreover, due to the high degree of coordinating hub involvement when co-developing, the communication is more frequent, open and informal in comparison to delegating and assembling activities.

4.4.2.4 Co-Creating

Also when co-creating, efforts to improve the quality of relationships to external partner firms become apparent. Cornelia Gaumann, DB Fernverkehr’s product manager for customer services, described “As with every good interpersonal relationship, you need to actively maintain and improve your business partnerships since it can happen that such a relationship ebbs away over the time”. Accordingly, recently SJ has launched a new systematic structure of working together with Trafikverket, which was developed by SJ’s Daniel Raftö to improve the cooperation. This was described to be crucially important since SJ is obliged to work with Trafikverket due to the agency’s state-appointed role in maintaining track infrastructure. Hence, different to the vast majority of external partnerships the cooperation with Trafikverket cannot be ended and thus needs to work sufficiently. The new structure creates joint mandates by establishing new top-down as well as bottom-up communication processes and meetings. Connected to this, the importance of an open and frequent communication when co-creating was emphasized. However, as the above-described example of the new working structure between SJ and Trafikverket illustrates, in comparison to co-developing activities with internal partners the communication tends to be more formal and regulated when the coordinating hub is co-creating with external partners. Nevertheless, Carina Hecher, LSG’s key account manager for the relationship with DB Fernverkehr, described “The cooperation with DB Fernverkehr is very close. We have an open exchange and give each other honest feedback. I especially like DB’s openness to our suggestions”. Accordingly, many respondents underlined having a relationship among equals, even though the coordinating hub pays its partner for the work it is doing, as being crucial for a fruitful relationship in a rather complex setting. Consequently, a clear buyer-provider distinction is described to be disadvantageous when co-creating.

4.4.3 (Institutionalized) Rules

Sofia Edholm, SJ’s head of customer insights and loyalty, described “When working with partner firms, you always need to find a common ground”. In accordance, the vast majority of the respondents underlined the importance of a mutual understanding of the partnership’s goals, resource base and involved actors. Regarding this, Karsten Kemeter, head of the product management for DB Fernverkehr’s long-distance trains, explained “One of the most important things when working together with other network actors is to jointly understand the cooperation’s interface by understanding the cooperation’s goals”. Furthermore, all respondents agreed that
trust develops over time while working together and is an important prerequisite for a successful service network. As Sofia Edholm described, “You can promote trust within business relationships by improving the relationships but you can also do it by adding control by means of contracts and performance measurements. It is a mix of it”.

4.4.3.1 Delegating

The interview respondents described that a corporate culture is actively promoted by the CEO of DB Group, Rüdiger Grube. However, distinct company cultures exist within different DB subsidiaries. Miriam Grafflage, DB Fernverkehr’s head of product controlling and quality, described “There are definitely subsidiary-specific cultures in existence. For instance, DB Regio has a rather decentralized structure, whereas DB Fernverkehr is more centralized. Hence, it is both natural as well as wanted that different cultures exist”. When delegating the coordinating hub mostly takes no efforts to bridge the different cultures except by determining the cooperation’s strategy and targets. Hence, in accordance with the low coordinating hub involvement in the partnerships, no extensive sensemaking is conducted. However, Philipp Kühn, customer and marketing manager at DB Regio, described about working together with different DB subsidiaries “Even though we have different cultures and sometimes are working rather parallel to each other than with each other, if the situation becomes serious, we are all employees of DB and stick together”. Connected to this a rather wide variation regarding the degree of trust between the coordinating hub and internal partners becomes apparent. While it was described that most of the time the partnerships between DB subsidiaries are trustful because both partners belong to the same corporation, mistrust was also mentioned. This mistrust was described to often result from conflicts of interests. Nevertheless, when delegating the coordinating hub does not actively promote trust apart from determining the delegated tasks and targets and is rather adding control than enhancing the relationship in regards to Sofia Edholm’s above-stated quote.

4.4.3.2 Assembling

Similarly as when delegating when the coordinating hub conducts assembling activities, it makes no extended efforts to build a common culture beyond the determined goals and performance measures (i.e. SLAs and KPIs). Moreover, the coordinating hub is not engaged in sensemaking to convince the external firm about the ‘rightness’ of the network interactions since the exchanged money as well as the prospect to extend the partnership beyond the contract duration are mostly regarded as being sufficient motivators. Nevertheless, partnerships in which the coordinating hub employs assembling activities were mostly described to be adequately trustful. Regarding this Bjarni Skipper, SJ’s head of traffic and fleet design, described “There are types of cooperation, which do not need a lot of trust. In those, it is most important that they are working and that the
customers can have trust that they will reach their destination as planned and promised”. Hence, when assembling it is important that the coordinating hub trusts the external partner firm’s ability to correctly execute the task assigned to it and, consequently, to reach the determined goals and performance measures. If this trust does not exist, external relationships were described to be ended relatively quickly if possible. In regards to this Daniela Steens, head of product strategy at DB Fernverkehr, described “We usually end a cooperation pretty quickly after realizing that it is not working out”.

4.4.3.3 Co-Developing
Similarly to the common vision, which is derived and co-developed from the corporate vision, also a common culture is derived from the corporate culture and is subsequently jointly specified to the area of working together when the cooperative hub engages in co-developing. Furthermore, the coordinating hub gets involved to a high degree and conducts extensive sensemaking when co-developing. The reason for this is the above-described perception that internal actors are more difficult to motivate. Hence, the coordinating hub needs to put extra efforts in sensemaking in order to encourage internal partner firms to engage in co-development activities. As an example the above-described event series Product Conference that is organized by DB Fernverkehr can be named, which includes regular meetings with representatives of all involved subsidiaries but also bilateral discussions, which aim at jointly creating a concept that all parties perceive as being beneficial. Due to the intense exchange and the common working culture, which are described to create an atmosphere that fosters the interchange of information and ideas, co-developing activities are described to promote a level of trust, which goes beyond the trust in the partners’ capabilities to fulfill the contract. However, Jasmin Bungert, senior manager at DB’s Project Traveler Information, described “Sometimes we experience that certain subsidiaries are rather hesitant to give us the needed data until they trust us what we will do with it”. Hence, also when co-developing a variation regarding the degree of trust between the internal partners exists which the coordinating hub can only partly influence.

4.4.3.4 Co-Creating
Several respondents stated that a common culture helps to avoid the formation of a buyer-provider distinction, which is described to be unfavorable if the coordinating hub aims at engaging in co-creation activities. Hence, a common culture was found to be actively promoted by the coordinating hub. For instance, this can be done by selecting partner firms with similar values. Carina Hecher, LSG’s key accountant for DB, explained “One reason that the relationship to DB is very fruitful is that both companies have similar values regarding, for instance, a high customer orientation”. In accordance, Claes Lindholtz, SJ’s head of business development, described “SJ is
only working with partner firms that are willing to sign SJ’s code of conduct, which includes regulations regarding ethics and sustainability”. Hence, SJ only engages partner firms that have desired mutual values. Since a cooperation’s vision, strategy and targets are co-created under the leadership of the coordinating hub, those partnerships are often built around the question ‘How can we reach our goal together?’ This question is described to be repeatedly emphasized by the coordinating hub in order to foster a common working culture. Moreover, similarly to co-developing, co-creating activities are described to include the active promotion of trust. Therefore, partnerships, in which the coordinating hub engages in co-creating activities, are often perceived as ‘places’, where knowledge, ideas and open feedback can be exchanged.
5. Discussion

The results of this study confirmed the academic perception that “services are increasingly designed, produced and consumed in networked constellations” (Ostrom et al., 2015, p. 135). Moreover, the proposed model of service network orchestration (cf. Figure 1) was empirically supported. The model and its four domains were found to be highly relevant in a practical setting and the interrelated nature of the domains became apparent. Nevertheless, the findings of this study challenge the current business network orchestration literature, which tends to implicitly emphasize close partnerships in which the coordinating hub gets involved to a high degree. In contrast, it was found that also rather weak ties between the coordinating hub and its service network partners, in which the coordinating hub is not involved to a high extent, exist and are found to be sufficient for partnerships that are perceived to be complex, central and/or critical to a rather low degree. Accordingly, Gadde and Snehota (2000) argue that a company can be highly involved with only a limited number of partner firms since developing partnerships is resource-intensive. Hence, a company “needs a variety of relationships” (Gadde & Snehota, 2000, p. 305).

Moreover, the existing network orchestration literature neglects the variety found in service networks also in another respect since it mainly examines interorganizational networks (e.g. Dagnino et al., 2016; Paquin & Howard-Grenville, 2013; Provan & Kenis, 2007). Hence, it does not take internal network actors into consideration. Nevertheless, it was found that internal and external service network actors are orchestrated differently. Thus, to draw a more appropriate picture of the orchestration of service networks, the following discussion encompasses internal and external partnerships as well as partnerships that are characterized by a high and a low degree of coordinating hub involvement. This variety of partnerships creates contexts in which diverse hub coordination activities are taken and required. A prominent feature of this study’s discussion is a set of twelve takeaways delineated from the actions a coordinating hub takes in regards to the identified domains of service network orchestration. Thereby, three takeaways are dedicated to each domain, out of which the first one presents a finding that is generally applicable in a service network orchestration context and the following two focus on the differences created by varying levels of coordinating hub involvement (i.e. low vs. high) and the proximity of the partner firm to the coordinating hub (i.e. internal vs. external). Hence, this set of takeaways provides an initial and extensive overview of the unexplored field of service network orchestration conducted by a coordinating hub. Mirroring this study’s purpose to provide a holistic understanding of the matter, the takeaways are formulated rather generically.
5.1 Hub coordination

The proposed service network orchestration model (cf. Figure 1) regards the coordinating hub as being responsible for extracting value from the network through planned actions (Dhanaraj & Parkhe, 2006), coordinating resources and relationships in order to create service (Lusch & Vargo, 2014; Vargo & Lusch, 2016) and, hence, for “making things happen” (Huxham & Vangen, 2000 p. 1160). Thus, the coordinating hub is identified as a service network actor with a leadership status which pursues to create an integrated service offering by gathering suitable partners in its service network. Indeed, the collected data confirmed that the coordinating hub is engaging partners with various desired resources in order to complement its own resources in regards to the creation of an integrated service. Thereby, the core competencies of the partners were frequently emphasized as being critically important in order to fill gaps that the coordinating hub cannot fill itself. In accordance with Vargo and Lusch (2016), the operant resources derived from the partner firms’ core competencies were found to be integrated and transformed within this study’s case companies’ service networks. Therefore, Takeaway 1 is formulated as follows:

**T1.** A coordinating hub engages service network partners with desired core competencies to be able to provide integrated service offerings

As described by Lorenzoni and Baden-Fuller (1995), one of the responsibilities of the coordinating hub is to communicate and implement a vision in its network. Moreover, Lorenzoni and Baden-Fuller (1995) describe that a network’s strategy, which is derived from the vision, is ideally jointly conceptualized between the hub firm and its network partners. However, this study’s findings indicate that a service network’s vision and strategy are not necessarily jointly developed. Especially in partnerships which are perceived as involving a low level of criticality, centrality and/or complexity and in which the coordinating hub is consequently involved to a rather low degree, the strategy was found to be determined solely by the coordinating hub while no extended common vision was described to be existent. Thus, in these cases the efficiency factor, as presented by Provan and Kenis (2007), is more emphasized than inclusiveness. Nevertheless, a joint vision and strategy development was found to be prominent in perceived central, critical and/or complex partnerships (e.g. SJ and Trafikverket or DB’s Project Traveler Information) which involve a high degree of coordinating hub involvement. Therefore, Takeaway 2 is formulated as follows:

**T2.** In partnerships characterized by low coordinating hub involvement no extended common vision exists and the partnership’s strategy is determined by the coordinating hub, whereas in partnerships characterized by high coordinating hub involvement the vision and strategy are jointly developed
In order to “make things happen” (Huxham & Vangen, 2000 p. 1160), the coordinating hubs were found to determine and monitor performance measures in their service networks. Nevertheless, Wilkinson and Young (2002) argue that too much hub control can diminish the responsiveness and innovativeness of a network and can hinder the usage of potential operant resources (cf. Vargo & Lusch, 2004). This was confirmed by the example of the internal partnership between DB Fernverkehr and DB Dialog. DB Dialog’s strictly defined and monitored tasks were described to prevent the subsidiary, which naturally knows much about DB Fernverkehr’s customers, from optimizing and from proactively contributing ideas and suggestions. Nonetheless, generally the respondents did not express concerns over strictly determined and monitored performance measures and simply viewed them as a necessary part of business interactions and even as potentially enhancing trust. Thereby, it was found that the performance measures within external partnerships are more strictly determined and monitored than within internal ones. Clearly defined key performance indicators (KPIs) and service level agreements (SLAs) were described to be utilized to determine the successful performance of the external partner firm and the overall viability of the partnership. Even though contracts also exist within internal partnerships, the agreements are described to be more generally defined and to leave more room for interpretation. Thus, Takeaway 3 is formulated as follows:

**T3. In external partnerships the coordinating hub determines and monitors performance measures more extensively than in internal partnerships**

### 5.2 Resources

Within service networks operant resources were found to be more vital than operand ones. The respondents commonly emphasized that partner firms contribute their operant resources such as expertise and a beneficial partnership for all involved parties is jointly created. This is in line with Vargo and Lusch (2016, p. 8), who argue “operant resources are the fundamental source of strategic benefit”. However, collectively integrating and transforming different sets of resources to “idiosyncratic complementary resource combinations”, as suggested by Lorenzoni and Lipparini (1999, p. 318) was found not to take place in every service network partnership. Especially in partnerships characterized by low coordinating hub involvement the coordinating hub receives and independently integrates the service or the task, fulfilled by the partner firm, in its service offering. Hence, the partnership is task-orientated and no exchange of resources that go beyond the ones needed for the task fulfillment is fostered by the coordinating hub. However, even if no extensive exchange of operant resources is promoted, the operant resources in possession of the partner firm are still important for fulfilling the task or service assigned to it efficiently and correctly.
This in turn enables the coordinating hub to create an integrated service offering (cf. Vargo & Lusch, 2004). Therefore, Takeaway 4 is formulated as follows:

**T4. A coordinating hub seeks to receive or exchange primarily operant resources from service network partners**

The scope of exchanged (operant) resources is purposefully varied by the coordinating hub. Consequently, not in all service network partnerships extensive knowledge exchange and collective learning are promoted. Hence, Möller and Rajala’s (2007, p. 903) notion that a network’s ability “to exploit the specialized knowledge held by each actor but also to expand this knowledge through collaborative learning” (emphasis added by authors) is crucial for a network’s success, is only partly confirmed. The partnerships of SJ and Jernhusen or DB Fernverkehr and LSG Sky Chefs, which include a high level of hub involvement and in which an extensive exchange of knowledge and collaborative learning takes place, support Möller and Rajala’s (2007) perception. On the contrary, the partnerships of SJ and DB Fernverkehr with some of their loyalty program partners are focused on jointly and efficiently executing the specific promotion. Thus, the coordinating hubs get involved only to a limited extent and, subsequently, the exchanged knowledge has a limited scope and no collaborative learning takes place. Therefore, these kinds of partnerships challenge Möller and Rajala’s (2007) above-stated quote. Regarding these partnerships it was described that further (operant) resource exchange is not needed for the partnerships’ purposes and, hence, is unnecessarily resource-consuming. Consequently, a buyer-provider distinction, which can be regarded as being a ‘hierarchy trap’ as described by Möller and Rajala (2007), is intentionally established by the coordinating hubs. Thus, Takeaway 5 is formulated as follows:

**T5. In partnerships characterized by low coordinating hub involvement the exchange of resources is limited to a specific task, whereas in partnerships characterized by high coordinating hub involvement the exchange of resources is general and extensive**

The coordinating hub is described to be a mobilizer of its service network partners and is responsible for keeping the actors motivated to contribute (operant) resources (Möller & Svahn, 2009). This was confirmed by the study’s results: a coordinating hub is trying to establish and maintain a sufficient degree of motivation within each partnership. However, in this context it needs to be mentioned that a high degree of a partner firm’s contribution is not expected by the coordinating hub, when it does not regard an extensive resource exchange as being needed. Generally, it was found that internal network partners are more challenging to motivate than external ones. A possible reason for this is that relationships with internal partners usually cannot be ended by the coordinating hub. Hence, the internal partner firms do not have to make efforts to
extend the contract duration. Thereby, it needs to be noted that also a few external partnerships such as the ones between SJ and Jernhusen cannot be ended due to the structure of the market. Nevertheless, this can be considered as being an exception. In accordance to Hakanen and Jaakkola’s (2012) notion of creating rapport among network partners, it was found that the ‘greater good’ within the network is frequently emphasized by the coordinating hub in order to motivate its internal network partners. Moreover, bilateral meetings were described to take place to establish a consensus. However, this was described to often be a longsome process. Accordingly, Takeaway 6 is formulated as follows:

**T6. Motivating internal network actors to contribute resources is more challenging to accomplish for a coordinating hub than motivating external network actors**

### 5.3 Relationships

As described by Ritter et al. (2004), the creation and successful management of business relationships can become a core competence for a company since relationships provide access to crucial resources. This was confirmed in a service network context by the collected data. Thereby, the relationships between the service network actors are developed through interactions between the parties (cf. Ballantyne & Varey, 2006), and the coordinating hub can engage in multiple activities when trying to enhance the quality of the relationships. However, it needs to be emphasized that the coordinating hubs were not found to actively engage in such activities in all of their partnerships. Moreover, in contrast to Paquin and Howard-Grenville’s (2013) advice that a coordinating hub should facilitate interaction between the diverse network actors, it was found that most of the service network’s interactions take place via the coordinating hub as a connector. Hence, the service network partners are not directly interacting with each other to a high degree. Nevertheless, it was described that a direct interaction of the network partners can have certain advantages, such as an enhanced creativity potential or the saving of the coordinating hub’s orchestration capabilities. Moreover, it was found that the coordinating hubs take efforts in order to improve their relationships with some of their partner firms. Along with engagement and connecting activities (cf. Paquin & Howard-Grenville, 2013), this study’s collected data identified that generalizing the partnership’s content and creating future prospects for the partnership are vital measures for enhancing a relationship’s quality. Until now this has not been emphasized in the existing literature. Nonetheless, it is argued that the generalized areas of working together and the future prospects of the partnership build a sense of stability, which is described as a component
in the creation of stronger relationships (Lorenzoni & Baden Fuller, 1995; Provan & Kenis, 2007). Thus, Takeaway 7 is formulated as follows:

**T7. Generalizing the partnership’s content and adding a future perspective are measures that can be taken by a coordinating hub to enhance a relationship’s quality**

As indicated above, a coordinating hub can use a variety of purposeful actions in order to strengthen its service network relationships. Regarding this the restructuring of the SJ-Trafikverket partnership can be named as an illustrative example. The new structure was developed by a respondent of this study and depicts a completely new way of collaboration between the two companies. It can be argued that this new structure resembles the “collaborative, integrative management approach” needed to create successful service networks as described by Hakanen and Jaakkola (2012). While the efforts to enhance and develop the quality of the partnership were described to be successful, they required plenty of time and dedication in order to be implemented (i.e. a high coordinating hub involvement). Hence, such extensive relationship improvement measures were found unlikely to take place in less central, complex and/or critical partnerships. Once again it should be noted that those kinds of relationships are regarded to be functional as they are and, therefore, no further development efforts are taken by the coordinating hub. This emphasizes the above-described general finding of this study that the current business network orchestration literature neglects the variety of relationships found within business networks. Thus, Takeaway 8 is formulated as follows:

**T8. In partnerships characterized by low coordinating hub involvement no extensive efforts are made by the coordinating hub to improve the relationships’ quality, whereas in partnerships characterized by high coordinating hub involvement more extensive efforts are made**

Communication was found to be an essential element regarding the successful orchestration of service relationships. In accordance, some scholars even claim that a network will eventually collapse if the level of communication is not good and frequent (e.g. Bleeke & Ernst, 1993). Moreover, in the context of orchestrated service networks the coordinating hub is described to have the responsibility to make the right (relevant and reliable) information available to the right actors within the network (Lorenzoni & Baden-Fuller, 1995; Ritter et al., 2004). This was confirmed by the collected data since the case companies are employing multiple ways of communication with their partners, including personal meetings, teleconferences and the exchange of emails and phone calls. However, it should be noted that the findings indicate that the extensiveness of communication varies greatly between partnerships. Nevertheless, generally it was discovered that the coordinating hub employs a more formal and regulated communication in
external partnerships than in internal ones. This becomes visible regarding periodical meetings and status phone calls, which allow the coordinating hub to maintain an adequate level of connection to its external partner firm. Nevertheless, it should be noted that communication can be highly influenced by other factors as well, such as the personal relationships between the involved employees, cultural differences in perceived communicative formality and the regulations found within specific company cultures. Nonetheless, Takeaway 9 is formulated as follows:

**T9.** In internal partnerships the communication between the coordinating hub and the partner firm is informal and regulated only to a limited degree, whereas in external partnerships the communication between the coordinating hub and the partner firm is more formal and regulated

### 5.4 (Institutionalized) Rules

Saz-Carranza et al. (2008, p. 14) describe that a coordinating hub needs to promote the joint development of “a common culture made of values, norms, customs, and rules” with its network partners. In accordance, a common culture between the coordinating hub and its partner firms was found within several of the partnerships in SJ’s and DB Fernverkehr’s respective service networks, especially in the ones that are characterized by a high coordinating hub involvement. Nevertheless, it was also found that a common culture is not a prerequisite of a partnership’s success. For instance SJ and the local public transportation authorities remain having their independent cultures and no extended efforts are taken to bridge those with a common culture, but the partnerships are still described to be stable and sufficient. However, even if no extended culture is shared, a shared understanding of the partnership’s goals was found to be crucial for a service network’s success. Hence, such an understanding needs to be ensured by the coordinating hub also in partnerships characterized by a low coordinating hub involvement. Therefore, a shared understanding of the partnership’s goals was found to be the minimum prerequisite to “enable and constrain action and make social life [...] meaningful”, as described by Vargo and Lusch (2016, p. 11). Accordingly, Takeaway 10 is formulated as follows:

**T10.** A coordinating hub needs to ensure a shared understanding of the partnership’s and service network’s goals

As Takeaway 10 indicates, it was found that a shared understanding of the partnership’s goals is a minimum prerequisite for a beneficial partnership. Especially in partnerships, in which the coordinating hub is involved to a rather low degree, these goals and the connected ways of collaborating are determined by the coordinating hub without much involvement of the partner firm. However, in partnerships, in which the coordinating hub is involved to a high degree, it was found that a common culture exists and is promoted by the coordinating hub. In those cases, in accordance with Provan and Kenis (2007), it was found that the coordinating hub engages in
sensemaking to foster the common culture and to create network legitimacy. Thereby, the question ‘How can we reach our goal together?’ is frequently emphasized by the coordinating hub. Moreover, it was found that selecting partner firms with similar values regarding relevant matters fosters the development of a common culture. However, it needs to be mentioned that public tendering processes, which have to be conducted under certain circumstances, can restrict the free selection of partner firms with suitable values. Nevertheless, Takeaway 11 is formulated as follows:

**T11.** In partnerships characterized by low coordinating hub involvement goals and rules are determined by the coordinating hub and no extended common culture exists, whereas in partnerships characterized by high coordinating hub involvement an extended common culture exists and is promoted.

Trust was found to be a crucial component of a service network. Therefore, Provan and Kenis’ (2007) perception that trust is not vital for orchestrated networks is challenged. However, it needs to be emphasized that different degrees of trust were found to be sufficient, depending on the relationship’s context. Thus, perceived ‘safe places’, “where ideas and knowledge can be exchanged”, as described by Lipparini et al. (2014, p. 593), were not found to be necessary in all service network partnerships. Particularly in partnerships that are characterized by a low coordinating hub involvement, trust that the partner firm can adequately conduct the task or service assigned to it, was found to be perceived as being sufficient. Therefore, no higher levels of trust are needed in those cases. Moreover, it was found that most partnerships are ended relatively quickly, if they do not involve a sufficient degree of trust perceived by the coordinating hub. However, since usually only external partnerships can be ended, this measure to regulate trust cannot be applied to internal partnerships. While most of the internal partnerships were described to be very trustful as the partners belong to the same corporation, some mistrust resulting from conflicts of interest was mentioned. Since those conflicts are sometimes deeply embedded within the corporation, the mistrust resulting from them can only be influenced by the coordinating hub to a limited extent. Therefore, Takeaway 12 is formulated as follows:

**T12.** In internal partnerships high variations regarding the degree of trust exist, which the coordinating hub can only partly influence, whereas in external partnerships the coordinating hub can more easily establish a sufficient degree of trust.

5.5 The overall applicability of the proposed service network orchestration model

The proposed service network orchestration model was developed based on existing literature on business network orchestration and service marketing. The domains of the proposed model, Hub coordination, Resources, Relationships and (Institutionalized) Rules, were intentionally defined.
broadly. Further, they were designed to reflect the multifaceted nature of service network orchestration, which mirrors this study’s purpose to provide a holistic understanding of the phenomenon. The findings of this study identify the hub coordination activities as driving forces behind the orchestration of the other three domains of service network orchestration. Hence, all of the four domains of the proposed service network orchestration model were found to be applicable and relevant in practice. Furthermore, the model’s inherent interrelatedness was confirmed. Thus, the coordinating hub was found to engage in relationships in order to access desired resources, while the relationships themselves are also considered to be operant resources of great importance (cf. Vargo & Lusch, 2004). Thereby, the compilation of resources through relationships is facilitated by the coordinating hub’s utilization of (institutionalized) rules, which provides a common working ground within the service network. Therefore, the proposed service network orchestration model is empirically supported by the collected data and it is found to be applicable in its entirety, even though it is derived from literature that tends to neglect the variety of service network partnerships found in practice.

Consequently, the proposed service network orchestration model is one of the first conceptualizations to holistically explain and depict the dynamics of service network orchestration. The inherent strength of the model is its inclusiveness as the vast majority of the hub coordination activities that were found to take place can be categorized within one of the four domains. Moreover, while the empirical data collection was conducted within a specific industry, there is no indication that the proposed service network orchestration model would not be applicable to other service industries as well. Nevertheless, rather than portraying the ‘single truth’, the proposed model and the derived set of takeaways are regarded as a starting point for supplementary empirical research, which can further develop as well as specify the results of this study. A summary of this study’s results is presented in Table 5.
Table 4: Summary of takeaways

<table>
<thead>
<tr>
<th>Domain</th>
<th>Conceptual Definition</th>
<th>Practice</th>
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- **Table 4:** Summary of takeaways

1. In entrepreneurial networks, communication is the key to success. Networking can move ideas and propel businesses forward, but it is crucial to understand the dynamics of successful communication and how to foster it.
2. Communication plays a crucial role in forming and maintaining relationships. Effective communication is essential for building trust and fostering collaboration.
3. In entrepreneurial networks, communication is not just about sharing ideas, but also about understanding the perspectives and experiences of others, which can lead to innovative solutions.
4. Developing strong communication skills is essential for entrepreneurs, as it enables them to effectively convey their ideas, gain support, and navigate complex situations.
5. The importance of communication extends beyond networking; it is critical in every aspect of an entrepreneur's journey, from founding to scaling a business.
6. In summary, communication is the backbone of successful entrepreneurship, driving innovation, collaboration, and growth.
6. Concluding Remarks

The purpose of this study is to provide a more holistic understanding of the phenomenon of service network orchestration conducted by a coordinating hub. To achieve this the term service network orchestration was defined for the first time and a novel service network orchestration model was proposed by synthesizing academic literature on business network orchestration and service marketing. To the authors’ knowledge this model is the first academic attempt to holistically explain and depict the dynamics of service network orchestration. The study was conducted in the passenger railway industry. By investigating the service networks orchestrated by SJ and DB Fernverkehr various distinct hub coordination activities were investigated. It was found that internal service network actors require different hub coordination activities than external ones. Nevertheless, until now the current service marketing and business network literature focuses on external network actors and neglects internal ones. Additionally, the existing literature implicitly emphasizes close partnerships, which include a high degree of coordinating hub involvement, while also rather distant partnerships in which the coordinating hub gets involved to a low degree, were found to exist within service networks. These partnerships were, in accordance with Gadde and Snehota (2000), described to be both sufficient as well as resource saving. Hence, this study’s results identified that the existing business network orchestration and service marketing literature ignores or neglects the variety found within service networks.

Even though the proposed service network orchestration model was derived from literature with a narrowed view on the variety of partnerships, the model was still identified as being applicable in practice. Accordingly, it was found that all of the four domains as well as their interrelatedness play an important and encompassing role in service network orchestration. Delineated from the various actions a coordinating hub takes regarding each of the four domains of service network orchestration, this study’s contribution is manifested in a set of twelve takeaways, which provide an initial overview of the unexplored field of service network orchestration. While the study was conducted in the passenger railway industry, there is no indication that the proposed service network orchestration model as well as the set of takeaways are not transferable to other service industries due to their inclusive and broad nature. However, rather than portraying the single and final truth, this study’s results are regarded as a starting point for further research on the complex and contemporary phenomenon of service network orchestration. Nevertheless, it is concluded that Ostrom et al.’s (2015) question “How can service firms efficiently allocate resources and divide tasks between actors in a (...) network?” was addressed and fundamentally answered by this study.
6.1 Managerial implications

This study’s results provide an initial and holistic understanding on how service network can be orchestrated by a coordinating hub. Since Ostrom et al. (2015, p. 135) state “services are increasingly designed, produced, and consumed in networked constellations” and the interview respondents commonly appraised service networks as becoming even more important in the future, it is essential to understand service network orchestration and its constituents. This study revealed that service networks in practice consist of a greater variety of partnerships than the current literature indicates. Hence, a coordinating hub can designedly utilize those varied partnerships in order to strengthen the service network and the resulting integrated service. Thereby, a coordinating hub is well advised to get involved into a partnership to a high degree, if the partnership is critical, central and/or complex. Moreover, by selecting service network partners that have compatible company values, a coordinating hub can create beneficial prerequisites for a close and fruitful cooperation. Nevertheless, if a service network partnership is not perceived to be critical, central and/or complex, a coordinating hub can save resources by maintaining sufficient and task-focused partnerships, which do not require much coordinating hub involvement. However, it was found that potentially more advantageous partnerships exist, which are restricted due to a low coordinating hub involvement. Hence, if such a potential is detected, a coordinating hub should get involved to a higher degree by broadening and enhancing the relationship, engaging in sensemaking and motivating the partner firm to contribute (operant) resources.

Moreover, when designedly utilizing a service network’s partnerships, the coordinating hub can facilitate the interaction between its service network partners. While both the business network orchestration literature (cf. Paquin and Howard-Grenville, 2013) and this study’s findings indicate that fostering the interaction between distinct network partners can provide advantages for the overall service network, it was found that this is done only seldom in practice. Hence, in order to exploit the benefits of a service network more, a coordinating hub should examine the potential of direct interaction between the service network actors.

6.2 Limitations and suggestions for future research

One of the main limitations of this study is that the empirical data was only collected on a specific point in time. However, a longitudinal research approach would allow researchers to investigate in what ways the hub coordination activities as well as the service network partnerships change and develop over time. Particularly, investigating how partnerships that include low coordinating hub involvement can become high-involvement partnerships and vice versa would be an intriguing avenue for further research. Moreover, the public character of the examined industry is of a special case, and thus it would be intriguing to see similar studies conducted entirely in a private
environment in order to evaluate, whether differences exist due to public versus private ownership. Furthermore, some limitations of this study could be related to the empirical data collection, namely to the selection of interview respondents and case companies. The majority of the respondents are employed by the case companies, and it is possible that their answers are biased and aim to portray their employers favorably. Nevertheless, the collected data was sourced from respondents with diverse responsibilities and also included perspectives from respondents outside of the case companies. In addition, the studied companies could have been more numerous, but due to the nature of the railway industry finding a national railway company from a third country to be included in this study would have been too resource-consuming for this study’s time frame and extent. Nonetheless, the selected two case companies were found to provide holistic insights on the phenomenon service network orchestration. However, a study with a more extensive scope of resources and time could naturally include more perspectives from diverse service network actors as well as a higher number of case companies to validate and further develop this study’s findings.

Furthermore, the proposed service network orchestration model as well as the set of takeaways provide a foundation for supplementary research which can further increase the understanding of service network orchestration. For instance, it would be intriguing to investigate if and under which circumstances establishing more extensive performance measures, which are comparable to the ones currently employed in external partnerships, with internal partner firms could be worthwhile. Moreover, the existing literature (cf. Provan & Kenis, 2007) describes that control can restrict the network partners and diminish the potential benefits a network can offer. However, most of the study’s respondents did not reflect this notion. Therefore, more research is needed to identify under which circumstances control becomes too restrictive. Another interesting area for further research is to examine under which circumstances increased interaction between the distinct network partners is beneficial and conversely under which circumstances it only consumes the coordinating hub’s resources when trying to connect its partners without providing sufficient advantages. Moreover, examining the impacts of service network orchestration on the consumers’ service experience is an essential avenue for further research as it would complement the findings of this study from a consumer point of view. These considerations will strengthen the overall applicability of the proposed service network orchestration model and facilitate further understanding of the complex and highly contemporary phenomenon of service network orchestration.
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Tagesschau (2015)


Usabilla (2015)

Uzzi, B. (1997)


Visnjic Kastalli, I. & Looy, B. (2013)  


Yin, R. (2009)  
Appendix

Appendix I: Case company descriptions

Case company description SJ

<table>
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<tr>
<th>SJ</th>
<th>CEO</th>
<th>Crister Fritzon</th>
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<tbody>
<tr>
<td>Employees</td>
<td>5 000</td>
<td></td>
</tr>
<tr>
<td>Revenue 2014</td>
<td>9 billion SEK</td>
<td>(= US$ 1 billion)</td>
</tr>
<tr>
<td>Transported passengers/day</td>
<td>85 000</td>
<td></td>
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Table Appendix I: Key facts SJ

SJ is a Swedish passenger train operator headquartered in Stockholm, Sweden, and is fully owned by the Swedish state. In 2000 SJ’s predecessor, Statens Järnvägar, was divided into six different companies, and SJ was given the responsibility for the passenger train operations, while, for instance, Trafikverket was created as an independent track infrastructure agency and Jernhusen as a station infrastructure company (SJ, 2016a). Thus, nowadays SJ is solely focused on passenger train operations. While the majority of SJ’s operations take place within Sweden, it also operates internationally with lines to Copenhagen in Denmark and Oslo and Narvik in Norway (SJ, 2016b). SJ’s corporate vision, “Ett SJ att lita på och längta till” (= a SJ to trust and long for), highlights the feelings of trust and belonging it wants to create for its customers (SJ, 2016c). In regards to creating new business partnerships, SJ is somewhat limited by the legislative directives concerning procurement processes, which instruct tendering processes for the award of contracts and are based on, depending on the contract value, Swedish or EU law. However, even though SJ is state-owned, it does not have to follow stricter procurement regulations than private competitors. Moreover, debate is ongoing, whether SJ is always subjected to these directives, since the Stockholm court recently ruled that SJ was not required to follow these directives in one particular instance (Dagens Juridik, 2015).

SJ used to be the only long-distance passenger train services provider in Sweden; however in 2009 a decision was made to liberalize the market (Svenska Yle, 2009). The Swedish Infrastructure Minister of the time, Åsa Torstensson, motivated the liberalization decision by stating that “the free competition would lead to cheaper and more flexible train tickets, and an increased usage of railway travel” (Svenska Yle, 2009). The increased competition for SJ intensified in March 2015,
when the Hong Kong-based MTR Corporation began operating passenger trains between Stockholm and Gothenburg, which is SJ’s most important revenue creating line (Svenska Dagbladet, 2013). The increased competition, and the resulting decreased ticket prices have been described as “SJ’s biggest challenge in 150 years” (Svenska Dagbladet, 2013). Nevertheless, up until 2014, SJ was able to generate even increasing profits, while also partly fulfilling the government-imposed financial performance requirements of, for instance, a return on operating capital of minimum 7 percent (SJ Annual Report, 2014). However, the financial impact of the increased competition resulting from MTR’s operations remains to be seen, as financial figures for 2015 are not yet available.

It is argued, however, that the new competition from MTR can have a severe impact on SJ’s financial results, since SJ ranks as the second most disliked company among Swedish consumers (Dagens Industri 2015), and has the lowest customer satisfaction scores among all transportation companies operating in Sweden (Svenskt Kvalitetsindex, 2015). According to the Svenskt Kvalitetsindex (2015), the main source of dissatisfaction were train delays. The customer satisfaction level is thus in direct contrast with SJ’s vision mentioned earlier. In order to address this discrepancy, SJ has adopted a more customer-centric approach by offering, for example, customer engaging digital solutions (Usabilla, 2015). To put it briefly, SJ needs to address the challenges, set by increased competition and poor customer satisfaction to continue fulfilling the financial targets set by the Swedish government.

**Case company description DB**

<table>
<thead>
<tr>
<th>Deutsche Bahn (DB)</th>
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<tbody>
<tr>
<td><strong>CEO</strong></td>
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<tr>
<td><strong>Employees</strong></td>
</tr>
<tr>
<td><strong>Revenue 2014</strong></td>
</tr>
<tr>
<td><strong>Transported passengers/day</strong></td>
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**Table Appendix 2: Key facts DB**

Deutsche Bahn AG (DB) is a mobility and logistics company headquartered in Berlin, Germany. It is a private joint-stock company with the federal republic of Germany being its sole shareholder (Deutsche Bahn, 2015a). While DB has more than 1,000 subsidiary companies, which are operating in the passenger as well as freight transportation segment both in Germany as well as
Internationally, the company describes railway operations in Germany as being its core business (Deutsche Bahn, 2015a). DB’s vision is “Becoming the world’s leading mobility and logistics company” by creating a lasting balance between economic, social and environmental interests (Deutsche Bahn, 2015b). In contrast to SJ, DB is conducting many of the tasks connected to its railway operations (e.g. maintenance of trains, tracks and stations) in-house. Since 1994, private companies have been operating on regional railway connections in Germany, thus depicting competition for DB. In contrast, DB’s long-distance subsidiary, DB Fernverkehr, is still a de-facto monopolist on the railway tracks. However, in 2013 the long-distance bus market was liberalized in Germany. The private long-distance bus companies offer tickets to significantly cheaper prices than DB Fernverkehr does (Frankfurt Allgemeine Zeitung, 2015). Additionally, frequent train delays are leading to dissatisfied customers (Spiegel 2015a), depicting a similarity to the Swedish market. As a result, the long-distance buses’ market share is rapidly growing from 5.9 percent in 2014 to 11 percent in 2015 and experts predict revenue losses of up to 240 million euros per year for DB in the next five-year period (Horizont, 2014; Spiegel, 2015b). Mainly due to this development and, additionally, a strike and a storm in early 2015, DB Fernverkehr reported a poor financial performance of only half of the revenue compared to the same period in the preceding year for the first half of 2015 (DB Interim Group management report, 2015).

Since DB is governmental-owned, the German government pre-determines the divided DB has to pay at the end of each year. For 2015 the dividend was determined to be 850 million euros (Tagesschau, 2015). Due to the above-described poor financial performance, it is expected that DB has to go into debt further in order to fully pay the divided (Tagesschau 2015). Hence, DB is under pressure to improve its performance. In order to do so, DB has announced the restructuring project “Zukunft Bahn” (lit. Future Rail), which, amongst others, aims at enhancing DB’s service orientation (e.g. availability and convenience) while offering a ‘Mobility Chain’ (i.e. a holistic travel service) (Deutsche Bahn, 2015c). Different to SJ, DB has to follow certain regulations due to its state-owned character, which are stricter than regulations for private companies. In order to prevent bribery in the public sector, DB can only award certain contracts after conducting a public tendering process, which is, depending on the contract value, based on German or EU law (BMWI, 2016).
Appendix II: Interview framework

1. Background Information:
   - Name:
   - Position and Team:
   - Company:
   - How long have you been at the company:
   - Please describe your tasks/your position in your own words:

2. Service:
   • Please describe the efforts your company makes to provide (enhanced) service.
     - Why has your company chosen to offer (enhanced) service?
   • Which partner firms are involved (i.e. network partners)?

3. Hub coordination:
   • How do you work with your network partners?
     - How do you choose your partner firms?
       - Is the connection based on established tradition, legal contracts, informal social ties etc.?
       - How do you communicate/implement the vision/business idea to your network partners?
       - How is the network structured? (-> How does it look like?)
       - How much debate/exchange is involved in the network? (-> joint decision making, monthly catch up meetings etc.)
   • Is there a strategy behind how you work with your network partners?
     - Who determines the strategy?
       - How much freedom (=flexibility) do your network partners have? (-> flexibility vs. stability)
         - Is this done on purpose or did it naturally develop?
       - Do you think (service created within) networks will become more important in the future?
         - If yes: Why and how do you (strategically) prepare?
4. Resources

- What kind of resources (tangible and intangible) are exchanged with your network partners? How do these exchanges take place?
  - Which network partner contributes which resources?
  - How are those resources used to create service for the customers?
  - How is ensured that the needed resources are available when needed?
  - How do you keep the network partners motivated to contribute resources to the network (even more than they ‘legally’ have to)?

- Does knowledge exchange take place between you and the network partners? (e.g. sharing feedback, ideas/suggestions for development, problems)
  - Do you actively promote knowledge exchange?
  - Do you think learning takes place in the network (resulting from knowledge exchange)? (-> you learn from your network partners; they learn from you; you learn together)

5. Relationships

- How are the relationships within the network managed?
  - Do personal connections play an important role within the network?
  - Are the roles (-> specific tasks & responsibilities) within the network clearly defined, or are they more ambiguous?
  - Do you actively promote relationships (-> interactions) between the network partners?
  - How is continuous communication promoted within the network?
  - How are conflicts within the network solved? (-> joint problem solving)
  - If a network partner fails to fulfill its tasks, what consequences follow and how is the situation managed?

- How do relationships within the network develop during the years? (Deepen, expand, diminish etc.)
  - Are there any initiatives to actively improve (the quality) the network’s relationships?
  - Does your company offer continuous support and guidance to the network partners?

6. Institutionalized Rules

- Does a common culture (shared rules, values, goals) exist between the network partners?
  - If so: How is it visible? Does you company actively promote a common culture? How?
- If not: why not?

- How does your company engage in ‘sensemaking’ (-> convince the other partners about the network’s “rightness”)?

**- How important is the existence of trust between you and your network partners according to your point of view?**
- Do you perceive that trust exists within the network? (-> “safe place, where ideas and knowledge can be exchanged”)

- How do you facilitate trust within the network?
Appendix III: Description of service network actors

Description of service network actors: case SJ

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJ</td>
<td>The largest passenger train operator in Sweden, established in 2001. It is a profit driven commercial company owned by the Swedish state.</td>
</tr>
<tr>
<td>Jernhusen</td>
<td>An infrastructure company owning many of the Swedish railway stations, train depots and cargo terminals. Similarly to SJ, it is a profit driven company owned by the Swedish state.</td>
</tr>
<tr>
<td>Trafikverket</td>
<td>A governmental agency responsible for traffic management, including the management and maintenance of the railway tracks. It is also in charge of developing the Swedish railway network.</td>
</tr>
<tr>
<td>Samtrafiken</td>
<td>A company created to make collective transportation simpler, more accessible and more reliable. Takes responsibility for combining the timetables of various transportation operators together.</td>
</tr>
<tr>
<td>SEKO</td>
<td>A labor union that includes the railway workers. It is very critical of the Swedish railway system and the decommissioning that took place in 2001.</td>
</tr>
<tr>
<td>RKMs</td>
<td>RKMs (Regionala kollektivtrafikmyndigheten) are in charge of arranging the regional collective transportation within their jurisdiction through public procurement.</td>
</tr>
<tr>
<td>Loyalty program</td>
<td>SJ Prio partners include Scandic and First Hotels and Live It, which sells unique experiences. In collaboration with SEB, SJ offers the SJ Prio MasterCard. Finally, SJ Prio has plenty of ad hoc -partners, with whom SJ has temporary offers.</td>
</tr>
<tr>
<td>Entertainment</td>
<td>SJ’s onboard entertainment partners include C More, which offers multimedia streaming services for passengers, Spotify, which allows passengers to listen to music while onboard and the publishing house Bonnier, which offers digital magazines for the passengers to read.</td>
</tr>
<tr>
<td>Information</td>
<td>SJ collaborates with various information services companies in order to provide service to its customers. SJ’s main app development partner is Bontouch. Moreover, various telecom companies are involved with developing the onboard IT infrastructure.</td>
</tr>
<tr>
<td>Maintenance</td>
<td>In Sweden the maintenance of the trains has been outsourced and privatized to many independent companies, out of which EuroMaint, which used to be part of Statens Järnvägar before 2001, is one of the biggest.</td>
</tr>
</tbody>
</table>

Table Appendix 3: Service network actors SJ
Description of service network actors: case DB Fernverkehr

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB Fernverkehr</td>
<td>Responsible for operating DB’s long-distance trains. It is a de-facto monopolist in the German market.</td>
</tr>
<tr>
<td>DB Regio</td>
<td>Responsible for operating DB’s regional trains. Different to DB Fernverkehr, it encounters competition from private regional train operators.</td>
</tr>
<tr>
<td>DB Vertrieb</td>
<td>Sells the train tickets for DB Fernverkehr and DB Regio on various channels, such as selling counters, the DB webpage and the DB app.</td>
</tr>
<tr>
<td>DB Netz</td>
<td>Owns and manages the railway tracks in Germany. Event though the company is a DB subsidiary it has to act neutrally between DB and private operators when allocating the track slots.</td>
</tr>
<tr>
<td>DB Station &amp; Service</td>
<td>Owns and manages the train stations in Germany. Similarly as DB Netz it has to act neutrally between DB and private train operators.</td>
</tr>
<tr>
<td>DB Dialog</td>
<td>Responsible for addressing customer requests that reach DB on various channels, such as letters, telephone and social media.</td>
</tr>
<tr>
<td>DB Systel</td>
<td>DB subsidiary that provides DB with information and communication technology. For instance the DB’s sales system is hosted by DB Systel.</td>
</tr>
<tr>
<td>DB Project Traveler Information</td>
<td>Project that is responsible for collecting and providing holistic and cross-subsidiary customer information. It consists of and works closely together with employees of the different relevant DB subsidiaries.</td>
</tr>
<tr>
<td>LSG Sky Chefs</td>
<td>Company that is responsible for conducting the catering on DB’s new Intercity 2 trains. First external company that is catering on DB Fernverkehr’s trains.</td>
</tr>
<tr>
<td>Entertainment</td>
<td>DB Fernverkehr has various external partners that provide on-board entertainment. For instance, news can be watched on the train in cooperation with the TV channel ARD. Moreover, a partner for streaming movies on the train is currently looked for.</td>
</tr>
<tr>
<td>Information</td>
<td>In order to make use of its vast amounts of data, DB engages external data mining companies. Moreover, external app makers create apps for DB to make information available for the customers.</td>
</tr>
<tr>
<td>Loyalty Programs</td>
<td>For its several loyalty programs, DB is working with a CSR system provider, which hosts and makes use of the customer data. Moreover, connected to its bonus program, DB is working with hotels as well as bonus item providers, so that members can exchange their bonus points.</td>
</tr>
</tbody>
</table>

Table Appendix 4: Service network actors DB Fernverkehr