Managing Health Services - Tight Integration or Loose Coupling?

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Abstract

The extant modularity literature suggests two contradicting strategies—loose coupling and tight integration—for conducting supply chain management (SCM). This study analyzes how, in what circumstances, and for what purposes loose coupling and tight integration are applied in SCM within health and social services. The study is qualitative and exploratory. The analysis indicates four types of loose coupling, mainly related to purchasing and mostly applied in formal contracting to ensure lawfulness of service, and three types of tight integration, mainly applied in less formal projects to promote service effectiveness and add customer value. These SCM strategies support service delivery and do not exclude each other in the organization of health and social services. The study encourages health and social service managers to select the combination of SCM strategies that benefits all suppliers as well as end users of the services.

Keywords:

Supply chain management, Strategic management, Modularity, Health Service, Service management

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1. Introduction

Western countries have encountered unseen economic challenges caused by ageing populations and continuous developments in medical technology, health care, and social services. As costs skyrocket, more efficient ways of organizing health and social services have been sought. (e.g. Askfors and Fornstedt, 2018.) Among other solutions, the privatization and outsourcing of health and social services have expanded steadily in Western countries. Consequently, health and social services are increasingly produced in different public–private combination models (Maarse, 2006). Health and social service providers include private providers (small and large companies), third-sector organizations, municipalities' own production in the purchaser–provider split models, as well as municipality enterprises (Kallio and Kuoppakangas, 2012; Maarse, 2006). In addition, many providers from other service areas, such as cultural services, are part of the health and social services supply chains. Regardless of the production model, when numerous suppliers provide multiple health and social services, the suppliers must be managed. Management responsibilities include, among other things, purchasing service components from different providers and ensuring the flexible compatibility of the components within organized service entities.

As a consequence of the increase in outsourcing, multiple providers and a large variety of services, the service design and organization structure of health and social services can be considered modular (see De Blok, Luijks, Meijboom, and Schols, 2010; De Blok, Meijboom, Luijkx, Schols and Schroeder 2014; Gittell, Hagigi, Weinberg, Kautz, and Lusenhop, 2008; Sanchez and Mahoney, 1996; Vähätalo, 2012). According the latest review on service modularity (De Mattos, Fettermann, and Cauchick-Miguel, 2019), interest towards the topic has been increasing among scholars. However, studies tend to focus on e.g. service structures and benefits of modularity while no studies concerning management of modular services was found (De Mattos et al., 2019). To manage modular services, processes and organization structures, it is worth recognizing the literature on supply chain management (SCM) strategies in the modular environment. However, the extant literature provides two contradictory strategies related to SCM in modular production (Howard and Squire, 2007; Hsuan, 1999; Lau, Yam, Tang, and Sun, 2010). Tight supply chain integration is applied to promote continuous communication and collaboration and is said to enhance co-development and reduce interface constraints (e.g. Hsuan, 1999; Lau et al., 2010). In contrast, loose coupling is applied to give suppliers increased independence and to reduce the need for communication. Loose coupling is said to provide benefits in the development processes for new services in the modular environment (Baldwin and Clark, 2000; Sanchez and Mahoney, 1996; Schilling, 2000).

The relation between modularity and SCM has been described in several studies (e.g. Howard and Squire, 2007; Lau et al., 2010; Sako, 2002; Voordijk, Meijboom and de Haan, 2006). These studies are mostly conceptual, and the empirical evidence, which has only started to emerge, is mainly related to products. Research from the service perspective remains scarce although its importance has been recognized (Giannakis, 2011). In addition, the knowledge related to SCM in health and social services is fragmented (De Vries and Huijsman, 2011). Due to the nature of the services (which is different from the nature of the products) and the challenges of managing health and social services, it is interesting and important to study how the two theoretically contradictory management strategies (loose coupling and tight integration) for supply chains are applied in health and social services. The research question is formulated as follows: How, in what circumstances, and for what purposes are loose coupling and tight

integration applied in SCM in health and social services? This study contributes to the theoretical discussion of SCM in modular services. In addition, the study promotes understanding regarding SCM in health and social services, which has, according to De Vries and Huijsman (2011), been fragmented thus far.

The approach in this study is qualitative and exploratory (see e.g. Kotler and Armstrong, 1999). The research data were collected from three organizations responsible for managing health and social services. As these organizations employ different organizational strategies for their services, the organizations also have different supply chain management strategies. A total of 18 managers, responsible for health and social services SCM, were interviewed.

The paper proceeds as follows. First, in the Theory section, modularity and SCM are briefly presented and defined, after which two contradictory strategies for applying SCM in modular services and organization structures (according to the literature) are described. In addition, in the Theory section SCM in health and social services is described. In the Methods section, the empirical data are introduced, and the analysis is described. The different types of loose coupling and tight integration identified from the empirical data are described in the Results section. In the Discussion section, the empirical results are analyzed from a theoretical perspective. The paper closes with Practice Implications section which provides practical recommendations for health and social service managers.

2. Theory

2.1 Modularity, supply chain management and two contradictory strategies

Sundbo (1994, p. 245) defined service modularity as follows: "[S]ervices are created out of standard elements – modules – that can be combined for the individual customer at the moment of purchase. Thus, the content of the services is standardized but the standard elements can be combined in many ways when delivered." Modular services are connected to each other by interfaces that "are the set of rules and guidelines governing the flexible arrangement, interconnections, and interdependence of service components and service providers" (De Blok et al., 2014, p. 186). In addition to interfaces, inside the modules are design rules, which have no significant effect on other modules but have a large impact on the internal development process (Baldwin and Clark, 2000). Standardization in modularity has an important dual role in the performance of the systems. On the one hand, standards speed up the competition and alleviate the market penetration as they explicitly shape buyers' requirements for suppliers (Izsak and Edler, 2011). On the other hand, extensive standardizing might restrict innovation (Zhang and Gao, 2010).

Mentzer et al. (2001, p. 17) conducted a thorough review to define SCM and concluded that it "involves multiple firms, multiple business activities and the coordination of those activities across the functions and across firms in the supply chain." In detail, they defined SCM as "the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long term performance of the individual companies and the supply chain as a whole." (Mentzer et al., 2001, p. 18)

In the present study, to illustrate the SCM conducted by health and social services managers, two opposite concepts were adopted. The term "loose coupling" describes the distant and formal relationships between purchasers and providers, as well as the independent role of suppliers, in the modularity literature (see e.g. Howard and Squire, 2007; Orton and Weick, 1990; Schilling, 2000; Voss and Hsuan, 2009). In the modularity litera-

ture, tight coupling is often viewed as the opposite of loose coupling (Howard and Squire, 2007; Sanchez and Mahoney, 1996; Schilling, 2000; Voss and Hsuan, 2009). However, in the present study the SCM perspective was also considered important. Therefore, instead of the term "tight coupling," the term "tight integration" was chosen as the opposite of loose coupling to illustrate the close, informal and mutually dependent relationships between purchasers and providers. Accordingly, in the SCM literature, tight integration usually describes close relationships within the supply chain (Meijboom et al., 2011; Power, 2005). However, the discourse of integrated care (see e.g. Somme et al., 2014) is not consistent with the discourse of SCM integration (see e.g. Power, 2005), although the two discourses have several similarities.

In the extant literature, Lau et al. (2010) and Howard and Squire (2007) recognized two contradictory opinions concerning SCM in the modular service environment. Tight supply chain integration, which is applied to promote continuous communication and collaboration, enhances co-development and reduce interface constraints (e.g. Hsuan, 1999; Lau et al., 2010). Loose coupling, which is applied to give greater independence to suppliers and to reduce communication, provides benefits within the new service development processes in the modular environment (Baldwin and Clark, 2000; Sanchez and Mahoney, 1996; Schilling, 2000). Next, these two SCM strategies are described in more detail. The focus is particularly concentrated on coordination, collaboration, information sharing and standardization as these are prevalent in the academic literature in cases of both loose coupling and tight integration (see e.g. Pinelle and Gutwin 2006; Pohjosenperä, Kekkonen, Pekkarinen and Juga 2019; Peters, Meijboom and de Vries 2018).

2.1.1 Loose coupling in SCM

Several authors have argued that modularity is related to the independence of the components (e.g. Sanchez and Mahoney, 1996; Schilling, 2000) or to the loose coupling of the components, as Orton and Weick (1990) put it. Independence is based on standardization. Standardized modules are easily outsourced to suppliers (Hsuan, 1999) through the use of the loosely coupled approach in supply chains (Sanchez and Mahoney, 1996).

This loose coupling of the supply chain provides benefits in the development of new modular services. When interfaces are defined, the new modules can be passed on to different teams or providers to be developed autonomously (Baldwin and Clark, 2000). The independence of modules allows suppliers to focus on predefined standards and pay less attention to the modifications made by other suppliers (Jacobs, Vickery, and Droge, 2007; Lau et al., 2010; Sanchez and Mahoney, 1996). Thus, the need for communication and coordination among suppliers during the development process is reduced. Loose coupling of the supply chain entails concealed coordination. Standard interfaces between service components in the modular service architecture enable embedded coordination, which significantly diminishes the need for managers to coordinate the development process. Instead, managers can monitor the output. Consequently, interfaces are kept at a minimum to reap the cost benefits from the reduced coordination. (Sanchez and Mahoney, 1996.)

Loose coupling as an SCM strategy means that suppliers are kept at arm's length. Purchasers may provide only critical information to suppliers, thus mitigating knowledge leakage (Lau et al., 2010). This strategy benefits the purchaser as suppliers use their maximum competence in design and production capacity. However, this strategy also involves the risk of losing technological understanding, negotiation power and control of architectural knowledge. (Sako, 2002.)

2.1.2 Tight integration in SCM

Close buyer–supplier relationships are required as companies move from single component sourcing to joint responsibilities in design, production and delivery. For example, tight integration of the supply chain is needed to solve technical problems and create interfaces for new modules (Howard and Squire, 2007). Supply chain integration can be particularly important in the development of new services (Lau et al., 2010).

According to Jacobs et al. (2007), outsourced modules require extensive integration to help suppliers develop innovations through collaboration. When new modules are designed, suppliers are involved early in product design workshops and business meetings to work closely, co-develop and share information with suppliers (Lau et al., 2010). Information sharing is required at all stages of new service development, and it is particularly important when interfaces between services are chosen, when the product development process is monitored and when feedback from pilot projects is needed (Howard and Squire, 2007).

Lau et al. (2010) argued that extensive coordination, and therefore tight supply chain integration, is important in knowledge-intensive development of new products. In the development of knowledge-intensive services, knowledge sharing is necessary and cannot be left up to the embedded coordination mechanisms of modularity. Instead, active knowledge sharing and systematic integration should play a significant role in the development of knowledge-intensive new services. However, knowledge sharing has consequences related to knowledge leakage, and therefore, a balance between sharing and protecting information is required. In the end, it is in the managers' best interest to know what knowledge is shared and how it is shared, as well as who coordinates the sharing. (Lau et al., 2010.) According to Jacobs et al. (2007), knowledge leakage can be avoided in tight supply chain integration when the buyer and the supplier concentrate on communicating about the interfaces instead of the final product.

Jacobs et al. (2007) identified two ways in which product modularity has positive influences within tight supply chain integration. First, Jacobs et al. (2007) stated that product modularity improves forecasts. Thus, as suppliers feel they can depend upon the forecasts, the level of trust increases. Second, they argued that product modularity reduces communication barriers as a common language develops and is based on standard interfaces. This supports the ability to communicate more frequently, clearly and with less effort, which then supports information exchange and strengthens the relationship between the buyer and the supplier.

2.2 SCM in health and social services

Health and social services can be considered modular. For example, health and social services are produced in a complex environment that contains multiple providers and manifold services (De Blok et al., 2010, 2014; Gittell et al., 2008; Meijboom, Bakx-Schmid, and Westert, 2011). Due to the complexity and other reasons, such as information asymmetry prevailing in health and social services (Vähätalo and Kallio, 2015), supply chains must be managed.

SCM in health and social services has been studied, for example, from the perspectives of information technology and e-business (Bhakoo and Chan, 2011) and patient flows (Aronsson, Abrahamsson, and Spencs, 2011; Lillrank, Groop, and Venesmaa, 2011; Meijboom et al., 2011). In general, SCM practices are considered important in the health and social service context (Aronsson et al., 2011; De Vries and Huijsman, 2011). However, due to multiple stakeholders, the dynamic environment and the special nature of the services, management of supply chains in health and social services might not work the same way as in

manufacturing (De Vries and Huijsman, 2011). McKone-Sweet, Halmilton, and Willis (2005) argue that challenges emerge in managing the supply chain for health and social services due to misaligned and conflicting incentives, the need for data collection and performance measurement. Moreover, knowledge intensiveness of health and social services as well as the intangible nature of service outcome makes the management of supply chain processes challenging (Giannakis, 2011).

SCM includes supplier and customer relationship management, contract management and delivery process management, which are all strongly related to information flows (Naslund and Williamson, 2010). However, information flows and communication have been found to be challenging in health and social services. As solutions to communication problems, Meijboom et al. (2011) suggested cross-functional and inter-organizational teams, continuous integration practices and appropriate information technology, as well as long-term focus and trust. However, a prerequisite in successful SCM in health and social services is that all the actors have a systems approach and respect the supply chain as a whole. In addition, the focus should be on producing customer value and creating customer satisfaction. (Aronsson et al., 2011.)

Health and social services typically consist of large service entities. Therefore, many providers are often involved in service production (Meijboom et al., 2011). This involvement has been studied from the perspectives of, for example, service processes, service chains and integrated care paths or pathways (see Meijboom et al., 2011; Mur-Veeman, Hardy, Steenbergen, and Wistow, 2003; Vanhaecht, Panella, van Zelm, and Sermeus, 2010). Typically, these types of studies consider how a patient with a certain illness "flows" through the process. However, in health and social services, the services are not always streamlined standard processes (Bohmer, 2005). Instead, the services consist of multiple partly standardized and partly customized service elements provided simultaneously and in parallel by highly specialized professionals. Unfortunately, the medical professions have no tradition of significant cross-specialty collaboration; instead, they have a tradition of working in silos in a functional manner (see e.g. Glouberman and Mintzberg, 2001; van Wijngaarden, de Bont, and Huijsman, 2006). Due to these SCM challenges in health and social services, exploring how the loose coupling and tight integration strategies appear in health and social services is worthwhile.

3. Method

This study aims to provide insight into how two theoretically mutually contradictory management strategies for supply chains are applied in health and social services. The study is exploratory in nature (Kotler and Armstrong, 1999) because it investigates a theoretical topic in a new environment, namely health and social services, where it has previously only been discussed in a manufacturing context. As the data collection method, qualitative, open-ended interviews were selected. In addition, through qualitative interviews, this study aimed to gain an understanding of modularity in relation to SCM and thus avoid the confusion related to health sciences concepts, such as care paths and pathways.

The empirical data were collected during the spring of 2013 in Finland. Finnish Health and social services are organized according to the Beveridge model which was established in the United Kingdom in 1948, and its typical characteristic is public funding that comes from the state's general budget and is collected through taxation (Lopez-Casasnovas, Maynou, and Saez, 2015). Although the funding and the role of public and private operators differ from country to country (see e.g. Maarse, 2006), health and social services supply chains still need to be managed. In

this study, the perspective of public health and social services managers is examined. The interviewees were chosen from three public organizations responsible for managing health and social services in their municipalities. Municipalities where the selected case organizations operated represent, in Finnish terms, large and mid-sized municipalities ranging from approximately 80,000 to 200,000 inhabitants. The particular case organizations were chosen as they applied different methods of organizing, and thus different ways of managing, health and social services. The first case organization applied a purchaser–provider split, the second applied the agreement control model while the third had its own production under traditional hierarchical budgeting. Nevertheless, all case organizations had outsourced their health and social service production at least to some extent. Case organizations that use different strategies for managing health and social services were not chosen to compare the organizations per se. Instead, the purpose was to gain diverse perspectives on SCM in health and social services.

The interviewees included representatives of public purchasers and public providers that conduct SCM in social and health services, particularly in home services for the elderly. This particular service area was chosen as it can be considered a modular service area in health and social services. Home services for the elderly consist of a wide range of services and multiple providers. (De Blok et al., 2010; Vähätalo and Kallio, 2015.) The interviewees' positions varied from mid-level to senior management. Some managers worked mainly in purchasing. They were responsible for managing contracts with public and private providers. Some managers held dual roles. They were public providers while at the same time they acted as purchasers when they were subcontracting with private providers. After permission was requested from the representatives of the case organizations, the interviewees were selected based on the organizations' information available on the Internet. As such, the mid-level and senior managers responsible for arranging home services for the elderly were invited to volunteer for interviews. In total, 20 people were contacted, and 18 volunteered (9 interviewees from the first case organization, 5 interviewees from the second and 4 from the third). The number of interviewees corresponds to the size of the case organizations, as well as their method of organizing services. If purchasing and providing were separate, as in the first case organization, then there were more people to interview. The two selected interviewees who did not participate were from the second and third organizations.

Open-ended, qualitative interviews were conducted to gain nuanced information concerning the SCM of the three case organizations (Burns and Grove, 2009). Interviewees were asked to explain the services that their organizations provided for elderly individuals living at home. The interviewer presented specific questions in accordance with the research question, such as "How has the outsourcing been conducted?" "What kind of management tools are used?" and "What kind of collaboration is done with providers, if any?" The interviewer encouraged the interviewees to talk about their experiences and opinions openly and spontaneously. The interviews lasted from 53 to 147 minutes. All interviews were recorded and transcribed with the approval of the interviewees.

To explore SCM strategies in depth from the perspective of modularity, thematic analysis was applied. To explore the themes and the interactions between the themes, a systematic data reduction process that consisted of five steps was followed: reading the transcripts, segmenting the sentences and phrases, codifying the text segments, generating themes and categories and identifying relationships (Burns and Grove, 2009). Segmentation and coding began deductively to identify the two

contradictory SCM strategies from the data. During the coding process, the original codes were extended to include new themes and highlight the richness of the data. The qualitative analysis software NVivo was used to analyze the data. Software can support systematic analysis and mitigate information processing biases (Burns and Grove, 2009).

To classify tight integration and loose coupling, descriptions of collaborating, coordinating, standardizing and information sharing were searched for in the data. Classifying the data was ambiguous as not all the evidence from the data supported the pure types of loose coupling and tight integration as presented in the literature. Instead, in practice, the elements were mixed. In contradictory situations, the present research focused on the overall relationship between suppliers and purchasers in terms of whether the relationship was distant and independent or close and dependent. For example, in loose coupling, there were common denominators, such as formal and distant relations, as well as scarcity of communication between purchasers and suppliers. However, the amount and the specificity of service standardization varied. In tight integration, the common dominators involved project-based tight collaboration that aimed at adding customer value, for example, by balancing standardization and customization, as well as ensuring fluent information flow. The classification is summarized in Appendix 1.

4. Results

From the empirical data, four types of loose coupling and three types of tight integration were identified. The results regarding how, in what circumstances and for what purposes loose coupling and tight integration are applied in SCM in health and social services are summarized in Tables 1 and 2. While discussing the circumstances and purposes, the focus is on coordination, collaboration, information sharing and standardization as they are particularly prevalent in the academic literature on loose coupling and tight integration. These perspectives are summarized in Appendix 1.

4.1 Loose coupling in health and social services SCM

4.1.1 Loose coupling: detailed contracting

Purchasers coordinated their supply chains mainly through standardizing services, legal contracting and monitoring the contracts. Contracts were nuanced, entailing detailed descriptions of service contents and delivery processes. The descriptions are detailed because of the obligatory national standards and recommendations aimed at guaranteeing quality and customer equality in public services. The other important reason was the legal issues of contracting. Purchasers were afraid of confusion during the provider selection process or concerned that providers would take advantage of loose contracts and provide unwanted services during the contract period. In the interviewees' worst scenario, such situations would lead to court. Detailed contracts naturally led to detailed monitoring. In relation to monitoring, the suppliers produced the required information for the purchasers. However, actual practice took the form more of one-way data delivery than mutual knowledge sharing. Providers were kept arm's length, and only essential information was provided.

During the contract period, the collaboration between the suppliers and purchasers tended to be scant and formal. In some cases, purchasers invited providers to prepare the contract or comment on the details of the contract before the procurement process in order to achieve a common understanding of the goals of the purchased service. This way, as long as the suppliers produced the service in accordance with the contract and provided the information required for monitoring, they were independent.

4.1.2 Loose coupling: outcome-oriented contracting

The current literature on public procurement

emphasizes outcome-based procurement as a tool to trigger innovations in public services (e.g. Georghiou, Edler, Uyarra, and Yeow, 2014). In the present study, purchasers believed that outcome orientation would help providers focus on the effectiveness of the end results and develop innovations to achieve the required results. Purchasers wanted to support innovations by giving providers independence and keeping the service and process standards as minimal as possible. To promote outcome-based procurement, purchasers aimed at measuring the outcome and used bonuses and sanctions as coordination mechanisms. With bonuses and sanctions, the purchasers channeled the suppliers' focus to the end results or to strategically important service structures, such as preventive services.

Collaboration between purchasers and providers was not extensive as the purchasers appreciated and supported the suppliers' independence. When strategic lines and budgets were agreed upon, the purchasers wanted the suppliers to produce services and conduct development work independently and not feel the need to consult the purchasers about minor decisions.

Information sharing during the contract period was scant. However, early meetings and workshops were arranged before the contract period. This practice also aimed to support outcome-based procurement as purchasers wanted to have mutual understanding with providers concerning the goals of the service.

4.1.3 Loose coupling: pur4chasing with service vouchers

Service vouchers are one way to organize and for customers to purchase services. According to the data, all the case organizations provided service vouchers to customers for house cleaning or home care services, for example. Service vouchers were provided to a customer if he or she was entitled to it according to the collaborative assessment of customers' needs. Customers could then choose the provider and buy the service they preferred. Customers could select the service provider from the register maintained by the purchaser. Purchasers had defined the criteria for service production and evaluated the providers' eligibility for the register. On a few occasions, the register criteria were defined in collaboration with the providers. The aim of the criteria was to keep the standards at a minimum and provide room for suppliers' specialization, which would then draw customers.

As part of the coordination, purchasers were, in principle, responsible for monitoring the service providers that had been accepted for the register. However, in practice, collaboration and information sharing with the provider were exiguous. Service vouchers rely on customer coordination; customers coordinate the service and the service provider and eventually "vote with their feet" (i.e., walk away) if they are not satisfied. In this way, the case organizations had outsourced some of the coordination work to their customers.

4.1.4 Loose coupling: third sector's service provision

Because third-sector organizations (such as associations and trusts) worked voluntarily and mainly on non-contractual bases, strict requirements and standards for service production could not be applied. Purchasers tried to coordinate the third sector's service production by explicating the gap in the service process they wished the voluntary work would fill. Coordination was also conducted by offering financial support to associations if they provided certain types of complementary services.

Purchasers were invited to the steering groups in providers' projects, where the purchasers could promote collaboration, coordination and information sharing. Otherwise, collaboration and coordination were not conducted systematically, and information was shared mainly at the provider's initiative. As a solution for the lack of systematic collaboration, coordination and information sharing, the interviewees suggested that a nominated

integrator should be responsible for practical coordination and enhance collaboration and information sharing. The interviewees whose unit had such an integrator were satisfied with the third sector's role as a provider.

Based on the interviews, it can be concluded that the relationship between third-sector providers and public managers involved an independent role for suppliers, a minimum level of standards and minimum coordination, as well as rather unsystematic collaboration. Therefore, the third sector was loosely coupled in the health and social services supply chain.

Table 1 summarizes the essential aspects of the four types of loose coupling identified in the empirical data.

4.2 Tight integration in health and social services SCM

4.2.1 Tight integration: supplier facilitated, contract based

Based on the analysis, purchasers enhanced collaboration by requiring it in the contracts. Purchasers required suppliers, both public and private, to collaborate and enhance collaborative development with other suppliers and with the purchaser during the contract period. The purpose of this practice was twofold. First, with the use of collaboration requirements, purchasers wanted to enable constant service development during the contract period. Second, collaboration was considered an important mechanism to help providers to get to know each other and thus to understand larger service entities. The interviewees argued that an understanding of the big picture was the key to better customer service.

Development was conducted particularly in the form of projects. However, genuine collaboration within projects seemed to be challenging. One of the main challenges was related to information sharing. Private companies were said to be too secretive in that they protected their commercial secrets, whereas public providers had no such opportunity. This issue understandably induced mistrust between public and private suppliers. Coordination was deemed to be either the provider's or the purchaser's responsibility, depending on the project.

Another form of contract-based collaboration involved the development of techno-

Table 1. Types of loose coupling and use in health and social services SCM

TYPE	HOW	IN WHAT CIRCUMSTANCES	FOR WHAT PURPOSES
Detailed contracting	Contracts and monitoring are extensively detailed	Formal purchasing of services	To ensure the lawfulness of the services and to avoid conflicts with providers
Outcome-oriented contracting	The focus of the contract and the monitoring is on the effectiveness and the end results of the services	Formal purchasing of services	To support innovations and development work during the contract period
Third sector's service provision	Voluntary work is based on associations' initiative and interest	Non-contractual collaboration with the third sector	To complement the official services/ resources with voluntary work and thus add customer value
Purchasing with service vouchers	Providers are coordinated and monitored via a provider register	Formal purchasing of services	To increase customers' options and the innovation capability of providers, as well as to decrease the purchaser's coordination work

logical devices and applications during the contract period. Providers were obligated to develop the devices and applications in collaboration with users and other providers, which the providers needed to share the standard interfaces with. Collaboration requirements were a direct consequence of the purchasers' negative experiences related to unexpected development costs. For example, purchasers had been obligated to pay suppliers during the contract period in order to open existing interfaces and thus enable application compatibility with existing applications.

4.2.2 Tight integration: purchaser facilitated

Regardless of whether collaboration requirements had been formalized as part of the contract, in practice, purchasers had a significant role in facilitating collaboration and development work among the providers. Purchasers coordinated the development work by establishing development groups, leading the projects and providing themes for development work for the providers. The development work coordinated by purchasers focused on strategically important broad issues, including service standardization (such as the productization of services and defining the production criteria for the contracts) and coordinated processes, entailing smooth transfer of information (for example, developing core processes and optimizing organizational structures to support the coordinated flow of the service processes).

Because the purchasers are responsible for organizing high-quality services, the purchasers argued that they were responsible for having a comprehensive picture of the services and coordinating the large service entities. However, the purchasers pointed out that mutual collaboration was facilitated when all the stakeholders understood the big picture. The purchasers were convinced that if all the stakeholders had a common understanding of "what is the best for the customer," then sub-optimizing would decrease and trust would increase.

4.2.3 Tight integration: supplier facilitated, based on suppliers' own initiative

The data showed that the providers conducted, based on their own initiative, tight and constant collaboration with other public sector stakeholders, particularly in the form of projects and in minor ad hoc development work. The providers coordinated development work in various forms. Some of the development took place at the operational level and some at the managerial level, some within the units and some across the units. In addition, some development work was coordinated inside the health and social services sector and some across other public sectors' units, such as with cultural services and community planning. Providers conducted development work on their own initiative, without any specific collaboration requirements in the contracts.

Development work focused on operations issues, such as standardizing work practices and enhancing information transfer. However, interviewees reported several challenges in voluntary collaboration related to organizational boundaries, budgeting, attitudes and personal chemistry between stakeholders. Organization boundaries and budgeting were obstacles to collaboration, and they were said to promote sub-optimization. Although sub-optimization clearly had a negative effect on the customers' service processes, the providers sometimes purposefully guarded their budgets and resources. However, sometimes sub-optimization was unintentional. For example, providers developed internal processes and did not consider the general effects of the changes on other units' processes. To minimize sub-optimization and enhance the fluency of processes, the organizations' structures were constantly evaluated.

Table 2 summarizes the essential aspects

Table 2. Types of tight integration and use in health and social services SCM

TYPE	HOW	IN WHAT CIRCUMSTANCES	FOR WHAT PURPOSES
Supplier facilitated, contract based	Contracts include the requirements for collaboration and collaborative development work	Development work considered important in municipalities' strategies	Purchasers want to promote collaboration and innovation and to enable development during the contract period and thus add customer value
Purchaser facilitated	Purchasers promote collaboration and development work as they establish and facilitate development projects	Development work considered important in municipalities' strategies	Purchasers want to promote collaboration while enhancing strategic development work and thus add customer value
Supplier facilitated, based on suppliers' own initiative	Providers collaborate on and facilitate development work voluntarily through cross-disciplinary and inter-organizational projects	Ad hoc/operational development and collaboration	Providers want to enhance the effectiveness and coordination of the processes and thus add customer value

of the three types of tight integration identified in the empirical data.

5. Discussion

This study analyzed how, in what circumstances and for what purposes loose coupling and tight integration are applied in SCM in health and social services. To answer the research question, 18 health and social service managers from three case organizations were interviewed. Data concerning SCM was analyzed particularly from the perspective of coordination, collaboration, information sharing and standardization. The analysis revealed that both strategies (loose coupling and tight integration) were used and considered valid in health and social service SCM.

The empirical analysis suggests that in the three case organizations, loose coupling was mainly related to purchasing and was typically applied in the form of detailed contracts. Detailed contracts were used to fulfill the health and social services managers' legal responsibility to coordinate and monitor the providers and to protect the purchasers from difficulties related to low-quality services, for example. As a response to the challenges experienced in contracting and monitoring, purchasers were cautious and kept their relationships and collaboration with providers formal. However, most of the purchasers found the current practice of detailed contracts problematic; the purchasers stated that the contracts were extremely difficult to draw up. Purchasers might experience that suppliers possess better knowledge of the services to be procured (see also Askfors and Fornstedt, 2018). Contracts were also considered inappropriately inflexible with no capacity to support innovations. On the one hand, detailed contracting and extensively standardized services, as part of traditional SCM, has been seen to diminish providers' opportunity to create value for customers and thus their ability to respond to changing customer needs (Zondag, Mueller, and Ferrin, 2017; Vähätalo 2012). On the other hand, standardization is considered essential element in loose coupling (Pohjosenperä et al., 2019). As a consequence, purchasers in this study wanted to avoid the dilemmas related to detailed contracting and extensive standardization and thus move to outcome-based purchasing, as also recommended by Georghiou et al. (2014) in public purchasing.

In addition to the disadvantages of detailed contracting, challenges related to outcome-based procurement were described in the research data. Given that measuring knowledge intensive services have been found

challenging in general (Giannakis, 2011), it is not a surprise that defining and measuring outcomes in health and social services, was considered extremely difficult by the informants of this study. Another challenge was that not all the suppliers providing services within the same service package or process were under the same bonus and sanction system. This complicated coordination and exposed providers to sub-optimization. Moreover, it was not possible to conduct loose coupling in its pure form in health and social services as the standardizing and coordinating remained extensive due to national laws and recommendations. Nevertheless, in the three case organizations, outcome-based purchasing somewhat resembles the original idea of loose coupling in SCM described in the modularity literature (see Sanchez and Mahoney, 1996) given that coordination was kept at a minimum and room was left for innovation.

The third sector's role in loose coupling was somewhat different as it was not based on contracts due to its voluntary nature. Third-sector providers were loosely coupled, which was not always intentional. To promote integration, some interviewees suggested bringing in an integrator to work between organizations and to reduce interface constraints. There have been positive experiences in health and social services concerning integrators as coordinators of the complex environment (e.g. Gittell et al., 2008). Integrators could also work in the service voucher system, where currently coordinating providers is the end users' responsibility. However, the current arrangement is problematic, for example, in the services for the elderly, as the end users are not always competent enough to conduct such coordination. Thus, a challenge and a solution were identified by the interviewees in this study; however, the method for acquiring the resources needed to employ such an integrator was not self-evident.

The analysis suggests that tight integration in the supply chain had an important role in less formal coordination and collaboration. In tight integration, the main aim was to promote the effectiveness of the services by, for example, enhancing the fluency of service processes. This positive relationship between tight integration and better performance is also pointed out by Liu, Wei, Zhou, Ying and Huo (2016). Coordination is an essential part of development work in knowledge-intensive settings (Lau et al., 2010). In this study coordination was embedded in collaboration promotion in three ways: as a contract requirement, from the purchasers' initiative and from the suppliers' voluntary initiative. Voluntary-based tight integration in development work was prevalent within the public sector, while voluntary collaboration did not often occur between public and private suppliers. Through including collaboration requirements in contracts, as well as through employing bonuses and sanctions, managers promoted the missing collaboration. Purchasers believed that collaboration would, in the end, promote common understanding, information sharing and trust between different stakeholders. Although collaboration and development work were prevalent within the public sector, it was not without challenges. Collaboration challenges were related to organizational boundaries, budgeting and information systems, among others. These challenges led to the previously recognized phenomenon of poor information transfer, mistrust, sub-optimization and moral hazard which were further perpetuated by providers not knowing each other (McKone-Sweet et al., 2005; Meijboom et al., 2011; Liu et al. 2016; Pohjosenperä et al., 2019).

In the present study, three types of loose coupling and two types of tight integration were found in all of the case organizations. However, purchasing the outcome in loose coupling and contract-based tight integration were employed only in the first case organization. This organization clearly had a strategic focus for purchasing (see Paulraj, Chen, and

Flynn, 2006), and the organizations systematically aimed toward an outcome orientation in their procurement processes and had clear collaboration and development work requirements in their contracts. Experimenting with new practices was intentional in the first case organization; they had managers who had specialized in procuring services for the elderly and who had an enthusiastic attitude toward new procurement practices, as well as political support for their experimental practices. Case organizations 2 and 3 recognized the possibilities of outcome-based purchasing but had not yet conducted it. Their less strategic focus for purchasing and more traditional purchasing practices seemed to be related to the moderate purchasing knowledge and political inertia prevailing in municipalities. In addition, the authorities' and professionals' rigid attitudes toward new practices complicated the adaption of new purchasing practices.

According to the literature, both SCM strategies are suggested to support new service development. Loose coupling is said to promote providers' innovation possibilities by providing independence (Baldwin and Clark, 2000; Lau et al., 2010). Tight integration is said to promote innovation by enhancing collaboration (Lau et al., 2010). In the present study, purchasers reported good results in developing new services when loose coupling was applied in the form of outcome-based purchasing. Purchasers explicated the desired outcome and left room for innovation. At the same time, new service development was successfully promoted by all three forms of tight integration. Development work in the case organizations was conducted, as suggested previously by Meijboom et al. (2011), in various forms of cross-disciplinary and intra-organizational projects. According to the present study, the important elements in collaborative development were shared goals, customer orientation and stakeholders' understanding of supply chains in general. These findings support the earlier findings of Aronsson et al. (2011). Common understanding was also promoted before the contract period through meetings early on where the aims of the procured services were developed or clarified together by managers and suppliers. Early collaboration is recognized as important in innovation development (Hsuan, 1999).

In tight integration, coordination was mainly related to project management and did not have significant challenges. In loose coupling, coordination was mainly related to providing a comprehensive overview of the service process and monitoring the providers. Based on the interviews, it seems that the purchasers in this study mainly understood the big picture of the services provided in their area of responsibility, the importance of which has also been recognized in the literature (e.g. Meijboom et al., 2011). Providers considered monitoring one of the most challenging tasks. First, controlling and providing independence was difficult to balance. Second, relevant monitoring indicators were difficult to define. Third, managers were not always satisfied with the information they received from the providers. Sometimes the information was raw data that were difficult to turn into information, and sometimes, the information was received too late to be helpful. These findings are in line with those of McKone-Sweet et al. (2005), who concluded that the problems in defining measurement indicators and those related to insufficient information production were the primary barriers for effective SCM in healthcare.

In loose coupling, information sharing can be viewed as happening through standard interfaces and by providing only critical information to the suppliers (e.g. Sako, 2002). In contrast, in tight integration, information sharing is considered important in all stages of new services development (Howard and Squire, 2007), particularly in the case of knowledge-intensive businesses (Lau et al.,

2010). In health and social services, information sharing has always been challenging due, for example, to unstandardized information transfer systems, as well as strong professional silos that do not encourage information sharing across professional boundaries (see Glouberman and Mintzberg, 2001). In addition to confirming these traditional challenges, the present study also revealed challenges related to current changes in the health and social services production environment. As a consequence of increasing private sector involvement and the related secretiveness, information sharing has become even more challenging. In this study, purchasers aimed to tackle these challenges by implementing tight integration, for example, by creating routines for information sharing and alleviating mistrust through collaboration. Hopefully, the evolution of information systems will alleviate the challenge of information sharing and mistrust in the future, as suggested by Meijboom et al. (2011).

Predefined standard interfaces are said to promote providers' independent development work (Baldwin and Clark, 2000; Jacobs et al., 2007; Lau et al., 2010; Sanchez and Mahoney, 1996), while extensive standardizing might restrict innovation (Zhang and Gao, 2010). According to the results of this study, balancing between standardization and encouraging innovation is challenging. On the one hand, managers aimed at outcome-based procurement to provide room for innovation. On the other hand, extensive development work was conducted at the operational level and aimed at standardizing common practices, such as care practices and information transfer practices.

Figure 1 summarizes the empirical findings of this study and provides a conceptualization of SCM in health and social services.

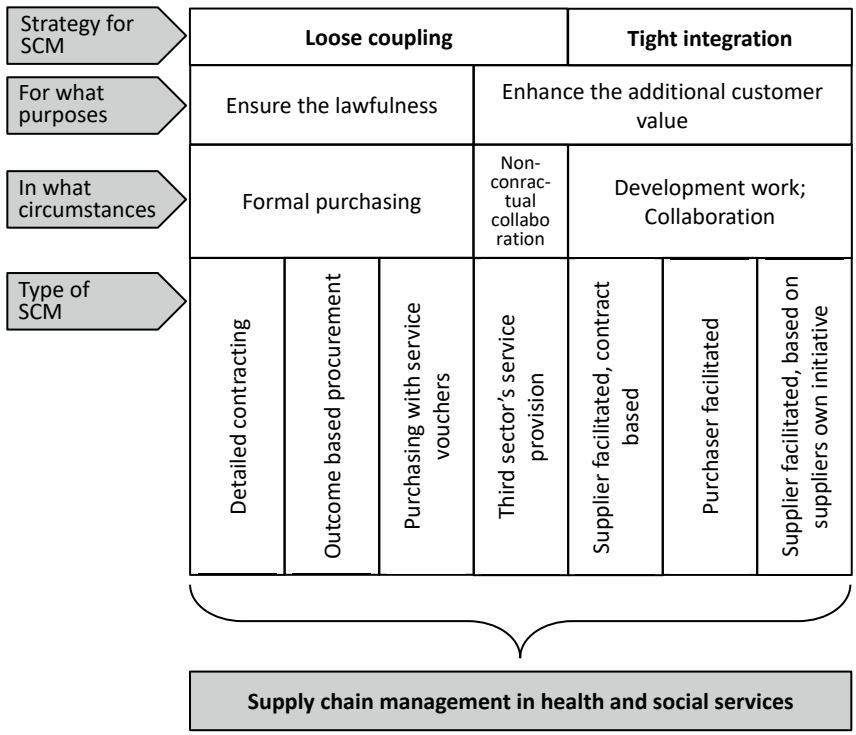

Figure 1. Loose coupling and tight integration in supply chain management in health and social services

As illustrated in the figure, both SCM strategies are applied simultaneously in health and social services although for different purposes. Both strategies have an important role and cannot be entirely substituted by the other. Accordingly, from the modularity perspective tight integration and loose coupling are mutually contradictory SCM strategies (Howard and Squire, 2007; Lau et al., 2010). Paulraj et al. (2006) suggested that tight integration of suppliers is a recommended SCM strategy as it enhances information sharing and cross-organizational teamwork. The findings of this study support this interpretation. However, also loose coupling as a SCM strategy is justified in health and social services because the purchasers' legal responsibilities lead to a certain amount of formality in SCM. Purchasers are officially supervised regarding the services they buy for end users because of the high ethical nature of the services and the vast external standardization of health and social services. This makes the health and social service context different from that of, for instance, many manufacturing industries. Given that the strength of formal contracting is not in advancing collaboration also less formal SCM practices are needed. Tight integration practices seemed to be useful for these purposes.

In the present study, only public sector representatives who conducted SCM were interviewed. The results, therefore, represent the perspective of public sector managers. Private providers' perspectives on SCM (that is, how private providers experience the SCM conducted by the public purchaser and how they conduct the SCM themselves) are beyond the scope of this study. The present research thus suggests future studies from this perspective. Moreover, given that the SCM practices described in this study were conceptualized based on qualitative interviews, they should be tested quantitatively in the future. In addition, it would be important to study how the different ways of organizing health and social services affect SCM in this context.

6. Conclusions

The focus of this study was in those SCM strategies that are related to modular production, namely loose coupling and tight integration (Howard and Squire, 2007; Lau et al., 2010). Although loose coupling can be intuitively associated with modularity (Baldwin and Clark, 2000) also tight integration is suggested to SCM strategy for modular products, particularly in knowledge-intensive settings (Lau et al., 2010). This study analyzed how these two theoretically contradictory management strategies for supply chains in modular product context are applied in health and social services which is, in extant literature, recognized as modular context as well (see e.g. De Blok et al., 2014; Vähätalo, 2012).

To summarize the results from a practical perspective, purchasers in this study applied different SCM strategies simultaneously for different purposes. Based on the analysis, loose coupling was related to outsourcing and formal contracting. As the case organizations were legally responsible for organizing services for customers, the organizations felt obligated to monitor the providers' production closely. As a response to the challenges experienced in monitoring and contracting, purchasers remained cautious and maintained the formality of their relationships with providers. To address these challenges more effectively, more education relating to purchasing practices and contracting should be provided for health and social service managers. In addition, separate units that allow managers to concentrate on purchasing and contracting are recommended. Based on the results of this study, good purchasing skills increase a manager's willingness to try new SCM practices. However, applying new, and perhaps risky, practices in these areas must also have political acceptance. Tight integration of the supply chain was applied to enhance the effectiveness of the process and customer value.

To promote these aims, collaboration and co-development were stimulated through cross-disciplinary and intra-organizational projects voluntarily and obligatorily. Thus, tight integration can be recommended as an SCM strategy particularly when services are complicated and trust among providers is an important issue as well as between providers and purchasers.

The results of this study can promote understanding regarding SCM in health and social services as, according to De Vries and Huijsman (2011), thus far, the knowledge related to SCM in health and social services has been fragmented. In this sense, the study contributes to the theoretical discussion of SCM in modular services by arguing that these two specific strategies do not exclude one another. Instead, they are used simultaneously for different purposes and in different situations in health and social services' everyday operations. However, more importantly, descriptions of the different types of SCM practices in this study will potentially encourage health and social service managers to pay attention to the strategic management of supply chains. Although there is no question that strategic management in general has many benefits, as Paulraj et al. (2006) described, in practice, however, different contexts might benefit from different combinations of SCM strategies. This study outlined different SCM practices for health and social service managers and helps them to select the most beneficial combination for their own purposes. For policy makers, the significance of strategic SCM must be emphasized. To enable strategic SCM practices, for example, in purchasing and collaboration, the political decision making at the local and government levels must be sustainable and have a long-range perspective.

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Appendix 1. Collaboration, coordination, information sharing and standardization in different types of loose coupling and tight integration in health and social services

SCM STRATEGY	COLLABORATION	COORDINATION	INFORMATION SHARING	STANDARDIZATION
Loose coupling: Detailed contracting	During the duration of the contracts, collaboration was scant. Sometimes, meetings were arranged before the contract period to get a common understanding about the aims of the procurement.	Coordination was related to monitoring the contracts and having an understanding of the service entities.	At the managerial level, information was delivered according to contract requirements. Only critical information was shared at the operational level.	The aim of the standardization was to guarantee the lawfulness of the service provision, e.g., the quality of the services, and to provide equal services for customers.
Loose coupling: Outcome-oriented contracting	Purchasers wanted an entrepreneurial attitude and independence from providers. Meetings before the contract period were particularly in order to clarify the goals.	Purchasers aimed at supporting independence and reducing coordination by concentrating on measuring the outcome.	At the managerial level, information was delivered according to the contract requirements. Only critical information was shared at the operational level.	The aim was to keep standards at a minimum in order to leave room for innovation.
Loose coupling: Third sector's service provision	Collaboration was mainly based on the third sector's initiative.	Managerial coordination was scant and related to financial support and steering groups' memberships. Operations coordination was conducted if there was a person designated for this task.	Information sharing was mainly based on the third sector's initiative.	Standardizing practices was challenging as the work of the third-sector providers was voluntary.
Loose coupling: Purchasing with service vouchers	Collaboration was scant. In strategically important services, providers could be invited to engage in defining the register criteria.	Coordination was related to registering the providers that are entitled to provide services. After the voucher was granted, the main coordination was transferred to the end users.	At the managerial level, information was shared according to the contract requirements. Only critical information was shared at the operational level.	Registration criteria work as a standard. The aim was to minimize the standardization in order to leave room for innovation.
Tight integration: Supplier facilitated, contract based	Collaboration between stakeholders was forced by contracts.	Strategic development was coordinated by purchasers; operations development was coordinated by providers.	Commercial secrets prohibit information sharing.	The aim of the standardization was to guarantee coordinated service processes.
Tight integration: Purchaser facilitated	Facilitating the collaboration was the purchasers' responsibility.	Development was facilitated by purchasers.	Commercial secrets prohibit information sharing.	The aim of the standardization was to guarantee coordinated service processes.
Tight integration: Supplier facilitated, based on suppliers' own initiative	Providers collaborated voluntarily, particularly with other public health and social service providers.	Coordination of the development project was based on the actors' own initiative.	Sub-optimization prohibits information sharing.	The aim of the standardization was to guarantee coordinated service processes.