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## Operations Management in Improving Elderly Home Care

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**Abstract:** The roots of Operations Management (OM) in manufacturing context, but there has been a growing interest in applying OM approaches in different types of service contexts, including the non-profit sector. In this study we explore what OM research can do to support the improving of elderly home care. A systematic literature review was done to find out the typical managerial implications of service operations management (SOM) research. Interviews and a group decision support system session during an improvement project were used to point out the operational-level problems and development targets in organizing elderly home care. By comparing the research focus of SOM with the operational-level problems observed in the case context, the paper helps in bridging the gap between SOM theory and practice. This research helps both researchers and practitioners understand how SOM research can benefit different types of target organizations.

**Keywords:** service operations; operations management; elderly clients; health care; home care; public sector; non-profit; literature review; case study

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## 1 Introduction

The average age of citizens is growing in most European countries. In Finland, people over 65 old represented 17.3% of the entire population in 2010. The proportion is expected to be 22.9% in 2020 and 26.3% in 2030. The same trend can be seen in other European countries (European Commission, 2011). During the past decades, governments all over the developed world have engaged in reforming their health care systems to cope with the challenges caused by ageing populations. The predicted growth of demand in care services needs to be satisfied while the amount of working-age population is decreasing (de Gooijer, 2007).

In general, elderly people want to live independently as long as possible, even when they need care and support (Stone, 2004; Vaarama et al., 2006). In some joint projects of EU-countries, improving the home care system has emerged as a central goal in meeting the service needs of the ageing population (Leichsenring, 2004; Vaarama and Pieper, 2006; Vaarama, 2009). It is justified to take an interdisciplinary approach in searching for all the possibilities there are to find resource-efficient solutions to organize sufficient home care services for the elderly. The solutions vary from purely technical approaches to organizational models and working practices. It is worth defining the roles of different disciplines in this type of projects. This paper focuses on clarifying the role of operations management (OM) research.

In OM, there is a long tradition of improving resource efficiency in industrial settings. Even though the industrial emphasis is strong, OM approaches have been successfully applied also to various types of service settings, such as health care (e.g. Langabeer II, 2008), tourism (e.g. Debata et al., 2012) and e-commerce (e.g. Chen, 2013). Recently, the scope has expanded to include also the non-profit sector (e.g. Lijo et al., 2012) and professional services, such as consulting (e.g. Balazin and Stefanic, 2013) and legal institutions (e.g. Pekkanen and Niemi, 2013). Also elderly care has attracted some research attention in recent years. De Blok et al. (2010; 2013) discuss customer involvement in designing modular service packages for elderly home care, and Meijboom et al. (2014) use insights from OM for developing a new model for case management in dementia care. This study takes a broader view on the topic and focuses on clarifying the potential role of operations management (OM) research in organizing and improving elderly home care.

The research questions in this study are:

- What are the typical managerial implications of service operations management (SOM) research?
- What kind of issues are there in organizing home care for the elderly and what is the role of SOM research in mitigating those issues?

To answer the first question, a review of existing SOM literature was done, resulting in a new categorization of the literature. To answer the second question, a case study was conducted in the Finnish social and health care sector. The research data consisted of several semi-structured interviews of personnel participating in the home care of the elderly, and material collected in a group decisions support system (GDSS) laboratory session. The interviews focused on gathering information on what kind of home care –related problems had been observed, how home care was organized and how problems were solved in the current situation. The GDSS session focused on collecting and sorting out suggestions for development targets. After that it was analyzed which of the problems could be approached from the OM perspective.

The paper is organized as follows. Section 2 defines the concept of service operations management, Section 3 describes the research design, Section 4 introduces the results, followed by discussion in section 5, and finally, section 6 presents concluding remarks.

## 2 Operations management in services

The purpose of this section is to describe the role of services in operations management literature. The history of OM is in the industrial context, and even though OM as a concept includes services, they are discussed relatively little in many OM textbooks. OM as a discipline is an applying one, and it refers to such disciplines as psychology, sociology, economics and mathematics. What is considered to belong to the topic content of OM is based on tradition and judgment. The outline of OM textbooks (e.g. Heizer and Render, 2011; Krajewski and Ritzman, 1999; Chase et al., 2001; Russell and Taylor, 2010; Slack et al., 2004) is typically organized according to the functions of a manufacturing company.

One way of defining OM is looking at the subject coverage of OM journals. Some literature reviews list the most covered topics in OM papers. In these reviews, services are typically considered as an individual topic within OM. Pannirselvam *et al.* (1999) reviewed papers in seven OM-related journals during the period 1992-1997. The most common topics were scheduling (25.5%), inventory control (16.2%), quality (11.3%), process design (11.3%), and strategy (10.9%). Services covered 2.7% of the published papers. Pilkington and Meredith (2009) made a co-citation analysis of OM papers during the years 1980-2006, and present that the themes representative of the structure of the OM field in the 2000s include: manufacturing strategy, empirical methods (and in particular qualitative methods), quality and its metrics, supply chain management, performance measurement, and the resource-based view of the firm. The authors detected an unexpected decline of interest in services. Taylor and Taylor (2009) present that eight topics represent almost 80 percent of the papers published in the International Journal of Operations and Production Management between 2004 and 2009. These topics are supply chain management (72 papers) operations strategy (48), performance management (32), service operations (27), lean methods (17), resource planning systems (15), quality management (14), and product design/development (12). Contrary to the findings of Pilkington and Meredith, Taylor and Taylor did not find a decline in interest in services. Service-related papers covered 8.7% of the total amount of papers. Several authors note that the most recent trend is that the focus of OM research seems to be shifting away from the manufacturing context towards the service context (Slack et al., 2004; Machuca et al., 2007; Smith et al., 2007). The growth of service research is typically justified by the proportion of services in the Gross Domestic Product.

It has been often noted that services have some notable characteristics that cannot be found in the manufacturing environment (e.g. Prajogo, 2006).

- Customers' participation in the service may influence the outcome of the operations
- Intangibility makes it difficult to control and monitor services
- There is great heterogeneity in customer expectations
- It is not possible to set a buffer between production and consumption
- Services are perishable – unused capacity cannot be used later
- Services are labor intensive, which emphasizes the importance of people management.

As the service context may differ significantly from the manufacturing context, the function-based categorization of OM-topics, which is usually found in OM-textbooks, is not necessarily the most applicable one in service contexts. Some literature reviews have been made that suggest categorization for SOM topics.

Johnston (2005a) presents in his literature review that the following issues have been dealt with in the SOM literature.

- Linking operations performance to business drivers
- Performance measurement and operations improvement
- Guarantees, complaints and service recovery
- People management
- Service design
- Service technology
- The design of internal networks
- The service encounter
- Managing service capacity

Johnston notes that guarantees, complaints and service recovery have been the most covered topics.

Machuca et al. (2007) present a more extensive literature review, consisting of papers from 10 OM-related journals and some conference proceedings from the period 1997-2002. The study categorizes the topics hierarchically under four main topics:

- Introduction and key issues of management in services (6 papers)
- Service operations strategies and objectives (139 papers),
- Design of service operations (115 papers)
- Planning, scheduling and control of service operations (211 papers)

The papers are divided to 22 sub-categories under the main topics, the most covered areas being: "selection and design of the service delivery system", "planning, scheduling and control in supply chains", "service productivity" and "inventory management and control".

Since the roots of OM are in the manufacturing context, it is easy to understand what the operations to be managed in that context are. Because services are emerging as the context, the application area of SOM is not as straightforward. Former literature reviews categorize SOM research by the topic, but do not review the actual managerial implications of research in the target organizations. In order to point out the role of OM in the service context, more case studies and a more pragmatic categorization of SOM research is needed.

### 3 Research design

According to Van Aken (2004), it has been remarked that the business world ignores the research coming from Business Schools. He states that the relevance problem of the academic management theory is not only caused by poor presentation but also by its nature, as most academic research in management is based on the notion that the mission of all science is to understand, i.e. to describe, explain and possibly predict. However, in management one needs research also in order to develop research products which can be used in designing solutions for management problems. Van Aken states that a major inhibition for adopting the academic management theory for instrumental use lies in the nature of the theory, and this theory is strongly influenced by the paradigm used for developing the theory.

Van Aken (2004) has introduced the concept of “Design science”, where the mission is to develop knowledge for the design and realization of artefacts, i.e. to solve *construction problems*, or to be used in the improvement of the performance of existing entities, i.e. to solve *improvement problems*.

The research method applied here has been designed to examine the role of OM in solving improvement problems in home care for the elderly. Since elderly home care is not a typical application area of OM, we view the issue also in more general terms: How can SOM research in general benefit different types of service organizations?

This research is organized under two sub-studies: the first one is a systematic literature review for finding out the typical managerial implications of past SOM research. Typically, former literature reviews have classified OM studies on the basis of the topic content and not on the basis of the research approach. Inspired by van Aken (2004), this literature review analyzes to which extent former literature presents artefacts for solving managerial problems, what kind of artefacts have been presented, and by what other means the target organizations have benefited from OM research. This kind of information is essential in bridging the gap between theory and practice.

The second study applies the case study approach, more specifically in-depth interviews and a DGSS session, for creating a rich description of the problem areas and improvement targets in organizing home care for the elderly. After this, the identified problems are compared to the problems addressed in earlier literature. The case study enhances understanding on the managerial problems in networks of non-profit organizations, which is an unusual, but possibly emerging application area of the OM theory.

#### 3.1 Systematic literature review of the managerial implications of SOM research

A systematic literature review was done of the most recent SOM-literature (years 2001-2013). The study of Bakker (2010) was used as a guideline on how to report on a systematic literature review. The International Journal of Production and Operations Management (IJOPM) and the Journal of Operations Management (JOM) were chosen for the review, as they are journals that are clearly OM-focused and have an impact factor.

SOM-related articles are published also in many other journals, such as *Decision Sciences*, *Harvard business review*, *International Journal of Production Economics*, *International Journal of Production Research*, *Management Science*, *Operations Research*, *Production and Inventory Management*, and *Production and Operations Management*. These journals were not included in the review basically for two reasons. Firstly, it was perceived that the wide range of topics covered

by the articles in these journals would necessitate a time-consuming classification of the articles to identify those that belong to the discipline of OM. Secondly, limiting the number of articles was considered necessary, because distinguishing the main managerial implications of the papers required more time than simple classification by keywords. Because the main purpose of this literature review was to find out in what ways OM research has benefited service organizations, rather than to classify the content of the literature extensively, it was reasonable to focus on a limited number of articles.

The literature selection process relied on the author's thorough reading and understanding of the literature, together with a set of more formal decision criteria. The criteria for including and excluding the papers were the following. 148 papers filled these initial criteria.

(1) Only service-related papers were included. In a majority of the papers the keywords included "services" or "service industry", but in some articles this was not explicitly mentioned. Especially health care –related papers were easily identified as belonging to the service context. Because of the limited number of articles, it was possible to read all the papers and decide which ones fulfilled the criteria of belonging to the service context. In unclear cases, the decision was made on the basis of the abstract.

(2) Papers that were considered to belong to the traditional manufacturing context were left out. These topics included manufacturing services and logistic services (e.g. inventory services).

When analyzing the contents of the literature (the papers that fulfilled the initial criteria) we used the research methodology as the main classification criterion, since the research method determines the type of knowledge it is possible to produce. The criteria were based on the concept of "design science" by Van Aken (2004).

In classifying the studies, we asked the following questions.

- Is it a case study? In other words, does it contain first-hand empirical material from a clearly stated target organization or organizations?
- Does it present a planning tool? (In other words: artefacts, i.e. to solve *construction problems*, or to be used in the improvement of the performance of existing entities, i.e. to solve *improvement problems*)

Subsequent to this classification phase, papers with similar managerial implications were clustered together without pre-determined categorization.

### 3.2 The case study

The case study method was used for discovering the managerial problems involved in improving home care. Case study is considered to be a preferable method when an analysis of rich empirical evidence is needed for gaining deep understanding of the studied phenomenon (Eisenhardt and Graebner, 2007).

The empirical material was collected from an improvement project of elderly home care in South Karelia, Finland. The focus was on health care and other municipal services targeted at over 75-year-old clients in the area. In this study, the term "elderly" is used for over 75-year-old citizens. In South Karelia, 10.1% of the population is over 75 years old, which is above the average in Finland. In absolute values this means around 13 500 elderly persons. On average, 15.5% of the elderly people received regular municipal care services in 2009. The need of care services is predicted to grow in the near future as the population is ageing. Therefore, it was considered necessary to

examine the current state of home care, and to identify what kind of changes would be needed in the system to manage the future volume growth. This study was carried out by OM researchers, because it was considered that a cross-disciplinary view would benefit the care organizations by introducing new approaches and tools used in other branches. During this study, the objective was to describe a wide range of staff views, to help in communicating the views between personnel groups, and to facilitate selecting targets for further improvement work.

The combination of the different parties involved in home care is described in Figure 1. There is no single organization that would provide all the services needed, but home care consists of activities of different parties. Home care can be perceived as a network that has some common goals. In general, it is assumed that home care is more economical than institutional care, but it is fundamental that the customer in home care is able to move to institutional care when needed. Unnecessary moves between home care and institutional care burdens the system.

<b>Institutional care</b>	Doctors	Nurses
<b>Emergency care</b>	Emergency call center	Paramedics
<b>Public home care</b>	Discharge nurse	Home care nurses
<b>Non-public home care</b>	Private service providers	Volunteer organizations

**Figure 1: Different parties involved in home care**

The majority of empirical material was gathered with semi-structured interviews in 2010. The group of interviewees consisted of different parties who participated in elderly home care. The aim was to collect workers' views on current practices and development needs in elderly home care. Even though customers are the most important participants of elderly home care processes, they were not interviewed, basically from two reasons. Firstly, the biggest development need in elderly home care from the customer's point of view was thought to be known already: there were often problems in devoting enough time for the home visits. Secondly, the customers' perceptions of the responsibilities of home care workers were very varied and in some cases erroneous.

Each individual interview lasted from 20 to 120 minutes, and the group interviews from 90 to 120 minutes. Each interview was sound-recorded and transcribed. The main objective of the interviews was to find out what kind of operational-level problems were encountered in home care for the elderly, how the operations were organized, and how problem situations were solved. The number of interviews in different personnel groups is presented in **Error! Reference source not found.** The analysis of the interviews focused on building a view of the current state of home care and picking up identified problem areas and development ideas for further processing.



Table 1: Interviews

Personnel group	Individual interviews	Group interviews
Home care personnel: nurses and practical nurses		12
Personnel in acute care: doctor and nurses		1
Head nurses	8	
Emergency duty personnel	3	
Doctors	4	
Paramedics	2	
Representatives of private home care	3	
Head and development director of elderly services	1	

The interview round was followed by a brainstorming session that was carried out in a GDSS (Group Decision Support System) laboratory. GDSS or Group DSS is an interactive computer-based system that facilitates the solution of semi-structured or unstructured decision problems by several decision makers who work as a group. In a narrow sense, the term GDSS is used to describe a network of computers in a face-to-face environment, such as a conference room, and software which enables a group to exchange written comments and votes. The purpose of a GDSS is to support a group in cooperating and working together effectively to reach its goals, and to support and develop the group decision making process. The GDSS technology supports group decision making by eliminating communication barriers, offering different tools to the group and managing the use of time, as well as handling meeting items systematically.

The point of the GDSS session was to spread information about the interview results, facilitate in prioritizing and processing the development ideas further, and to orient people towards the forthcoming development work. There were 8 participants in the GDSS session: a department head, two medical directors, two project managers, a development director, a director of home care, and a nurse. All participants were health care practitioners. The GDSS session lasted for 4 hours. In the beginning, the agenda of the meeting was explained to the participants. The agenda was to present ideas for improvement targets, evaluate ideas by their effectiveness and ease of implementation, and to select ideas for further development. The participants were oriented to the agenda by providing them with a report of the results of the interviews. Each participant worked anonymously on a personal computer. The participants were also able to see all suggestions in real time, and comment on the suggestions in writing. This way all the information sharing in the session became documented. When the development needs had been listed, they were discussed, and the most feasible and influential development targets were voted on. From these, three suggestions were selected for further examination, and introductory project plans were made.

## 4 Results

This section presents the results of the literature review and the case study. The purpose of the literature review was to enhance understanding of the typical managerial implications of service operations management (SOM) literature. The focus of the case study was to understand what kind of managerial problems and potential development targets there are in organizing home care for the elderly. As the final result we present how the noted development targets are related to the typical areas of SOM literature. This helps in defining the potential role of SOM research in mitigating the managerial problems of elderly home care.

#### 4.1 Results of the literature review

Figure 2 presents how the studies in the literature sample can be classified on the basis of the research approach used. The main classification is based on the concept of Design Science by Van Aken (2004), and we have refined it by using descriptive names for the methodological choices within the main categories. The studies were classified to four main categories on the basis if they were case studies and if they presented planning tools.

A study was noted to be a case study if it was stated so in the title or abstract of the paper. Also in some cases the study was noted to be a case study as it dealt with the operations of a clearly defined target organization from which empirical material was collected. Some of the studies combined several research methods (e.g. simulation, survey), but the study was regarded as a case study if it included a case study. A study was considered to present planning tools, if it introduced a model or method that had a clearly defined use in solving construction problems or improvement problems in a service organization. No distinction was made on whether the study presented a new tool or a new application for an existing tool. Typologies, concepts and frameworks were not regarded as planning tools, if their use in planning work was not clear. Lean philosophy, which was dealt with in several papers, was not regarded as a tool per se, but as a combination of approaches and methods that can be regarded as tools.

A planning tool presented	Yes	<b>2. Constructive literature studies, Other theoretical studies</b>  13% of papers (19)	<b>4. Design science studies</b>  8% of papers (12)
	No	<b>1. Data analysis studies, Surveys, Other empirical studies, Literature reviews</b> 56% of papers (82)	<b>3. Descriptive case studies</b>  23% of papers (29)
		No	Yes
A case study			

Figure 2: Classification of SOM studies on the basis of research orientation

##### 4.1.1 Studies that are not case studies and do not present planning tools

A majority of the studies in Group 1 (see Figure 2) used statistical data analysis methods, e.g. data envelopment analysis, correlation analysis, or regression analysis to determine the relationships between different factors, such as organizational structures, managerial decisions and company performance. These studies may enhance general understanding on the studied phenomena. Even though these studies did not present planning tools, they may still present general guidelines or recommendations. The data analysis studies could be divided into groups on the basis of what kinds of relationships were examined. Survey studies could be separated to their own group on the basis

of the data collection method, but in general, the research aims did not differ from other data analysis studies.

22 studies focused on defining the drivers of financial performance and/or perceived service quality (McDermott and Stock, 2011; Goldstein and Iossifova, 2012; Rosenzweig et al., 2011; Heim and Field, 2007; Chesteen et al., 2005; Safizadeh et al., 2003; Li et al., 2002; Goldstein et al., 2002; Frohlich and Westbrook, 2002; Boone and Ganeshan, 2001; Lee et al., 2011; McDermott and Stock, 2007; Sarkis and Talluri, 2002; Voss et al., 2005; Evans, 2004; Kastalli and Van Looy, 2013; Devaraj et al., 2013; Xue et al., 2013; Stouthuysen et al., 2012; McDermott and Prajogo, 2012; Chen et al., 2013; Capkun et al., 2012).

A group of studies could be identified, where the focus was on understanding human behavior. Some studies focused on identifying the drivers of customer satisfaction (Queenan et al., 2011; Youngdahl et al., 2003; Ancarani et al., 2011; Babbar and Koufteros, 2008; Venkatesh et al., 2012; Miles et al., 2012), whereas one focused on examining the impact of employee satisfaction (Yee et al., 2008) on service profitability and quality. Some studies focused on customer expectations in the online service context (Finch, 2007; Boyer and Hult, 2006), explaining customer buying choices in accommodation (Brotherton, 2004), car maintenance provider (Pereira et al., 2007) or concert tickets (Olson et al., 2005; Olson and Boyer, 2005). One study (Sousa et al., 2008) focused on explaining the drivers of perceived service quality and patterns of use of an e-service. Tucker (2004) examined the impact of operational failures on hospital nurses and patients.

A group of papers dealt with the drivers or internal decisions in the organization (Goodale et al., 2008; Das and Joshi, 2007; Dilts and Pence, 2006; Li and Benton, 2006; Gowen et al., 2006; Coltman and Devinney, 2013), a few papers focused especially on quality management (Power and Terziovski, 2007; Goldstein and Naor, 2005; Zhao et al., 2004; Boyer et al., 2012; del Mar et al., 2013), and one study dealt with quality award criteria (Meyer and Collier, 2001). The other studies dealt with such relationships as organizational impacts of service recovery procedures (Johnston and Michel, 2008), relationships between supplier relationships and supply chain performance (Field and Meile, 2008), the contingent nature of service recovery system structures (Smith et al., 2012), the impact of information technology sophistication on service practice and performance (Seán et al., 2006), the relationships between employee motivation, service learning and service quality (Hays and Hill, 2001), supplier relationships and internal and external service quality (Stanley and Wisner, 2001), operational factors, voluntary worker satisfaction and loyalty (Wisner et al., 2005), the relationship between service quality standards and service quality, customer satisfaction and loyalty (Hays and Hill, 2006), and the effect of differentiation strategy on process innovativeness (Das and Joshi, 2007).

Some of the surveys determined the extent of different types of phenomena, such as the implementation of operations management techniques (Prajogo, 2006), different innovation types (Oke, 2007), implementation of patient safety initiatives (McFadden et al., 2009), and operational efficiency of hospitals (Ramanathan, 2005).

“Other empirical studies” were studies that used empirical material, but analyzed it with other than statistical methods. These studies applied either uncommon research methods or aimed at building concepts for understanding the managerial reality. The uncommon methods applied were panel discussion analysis for analyzing human issues in service design (Cook et al., 2002), simulation (Klassen and Rohleder, 2002), field experiments in e-services (Voss, 2003; Rabinovich, 2007), and a combination of service transaction analysis and interviews in understanding the predictors of customer satisfaction (Hume et al., 2006). Some studies presented descriptive conceptual models

for operational capabilities (Coltman and Devinney, 2013), or strategies for service outsourcing (Zeynep and Masini, 2008).

“Literature reviews” describe and structure the contents of existing knowledge. Studies without any empirical material were classified as literature studies, even though some authors use the term “conceptual paper”. A relatively large proportion of the SOM studies, 16 altogether (Machuca et al., 2007; Johnston, 2005a; Menor et al., 2002; Hill et al., 2002; Johnston, 2005b; Bendoly et al., 2006; Brown and Hyer, 2007; Heineke and Davis, 2007; Chase and Apte, 2007; Metters and Verma, 2008; Youngdahl et al., 2010; Schmenner, 2009; Lightfoot et al., 2013) were literature reviews.

#### **4.1.2 Other than case studies presenting planning tools**

Group 2 (see Figure 2) consists of studies that did not focus on any specific organization, but still sought to present tools to be applied in planning work. “Constructive literature studies” do not have any first-hand empirical material, but rearrange existing knowledge in order to produce planning tools. “Other theoretical studies” are studies that do use empirical material, do not focus on any specific organizations, but seek to produce general planning tools for SOM. Typically, the planning tool is built on the basis of former literature, and its use is demonstrated with some empirical example. A majority of the tools can be put in three categories according to the use of the tool: 1) Planning frameworks for designing or improving services, 2) Measurement tools, and 3) Mathematical planning tools for specific tasks.

*Decision/planning frameworks for designing or improving services* included such tools as a model for improving patient safety (McFadden et al., 2009), a concept for improving the service design process (Goldstein et al., 2002), a method for determining the extent of service standardization (Pullman et al., 2001), a modeling method for service processes (Morita et al., 2012), and a framework for planning a goods and service offering mix (Henrique et al., 2007).

*Measurement tools* included such tools as a measurement scale for new service development competence (Menor and Roth, 2007), an approach for modeling service system performance (Juran and Schruben, 2004), measurement scales for customer service experience (Froehle and Roth, 2004), an instrument for measuring lean adaptation (Malmbrandt and Åhlström, 2013), a measurement scale for service orientation (Oliveira and Roth, 2012), a method for measuring the efficiency of post office stores (Borenstein et al., 2004), and a measurement scale for customer-perceived online service quality (Yang et al., 2004).

*Mathematical planning tools for specific tasks* included tools for such tasks as the optimization of volunteer labor assignments (Sampson, 2006), determining the best table mix in full-service restaurants (Kimes and Thompson, 2005), service location (Narasimhan et al., 2005), university schedule planning (Thompson, 2005), and minimizing customer waiting time in service processes (Sheu et al., 2003).

Other studies that did not fall into the above categories included a forecasting model (Dixon and Verma, 2013) and a video method for studying the wait-perception bias empirically (Seawright and Sampson, 2007).

#### **4.1.3 Descriptive case studies**

Group 3 (see Figure 2), Descriptive case studies, consists of studies that had a clearly defined target organization or organizations. The group of descriptive case studies was very heterogeneous. Some studies sought to provide clearer guidelines as conclusions, while in other papers the emphasis was on enhancing the understanding of different managerial tasks, but this was largely a matter of presentation style. In general, the descriptive studies offered reference cases to other companies working with similar issues, and some of the papers included internal comparisons in the target organizations. To some extent, the studies could be classified according to the type of managerial task they were related to. We found four popular themes, namely 1) Design of service operations, 2) Improving service processes, 3) Performance measurement, and 4) Supply chain and cooperation practices.

Papers dealing with *Design of service operations* focused on such issues as new service design (de Blok et al., 2010; Silvestro and Silvestro, 2003; Verma et al., 2006; Singh Srani et al., 2013), learning in service designs (Stuart and Tax, 2004; Heim and Ketzenberg, 2011), and service delivery system design (Ponsignon et al., 2011). Some papers focused on more specific service design decisions, such as modeling the service structure (Simpson, 2006), batching (Simons Jr. and Russell, 2002), layout (Pagell and Melnyk, 2004), and the coordination of physicians' activities (Broekhuis and Dirk Pieter, 2011). Papers dealing with *Improving service processes* discussed applying popular improvement concepts in services, such as lean thinking (Papadopoulos et al., 2011; LaGanga, 2011; Staats et al., 2011), six sigma (Nair et al., 2011), and focused factory (Pieters et al., 2010). The papers dealing with *Performance or quality measurement* focused on analyzing or measuring performance in general (Hyer et al., 2009; Elg et al., 2013), measuring customer satisfaction or service quality (Maddern et al., 2007; Caemmerer and Wilson, 2010), or auditing strategic operations (Lillis and Szejczewski, 2012). A few papers dealt with *Supply chain and cooperation practices* (Rivard-Royer et al., 2002; Bhakoo and Choi, 2013; van der Valk et al., 2009; Akkermans and Voss, 2013) or teamwork (Bamford and Griffin, 2008).

*Other* case studies that could not be put in the four categories mentioned above dealt with such issues as IT infrastructure requirement analysis (Waring and Wainwright, 2002), service strategy formulation (Daniel, 2003), service classification (Jambulingam et al., 2005; Lewis and Brown, 2012), understanding not-for-profit organizations (Olson et al., 2005), service acquisition (Schiele and McCue, 2006), and outsourcing professional services (Ellram et al., 2008).

#### **4.1.4 Design science studies**

In Group 4 (see Figure 2), Design science studies presented tools for solving organizations' construction problems or planning problems. The only difference with constructive literature studies and other theoretical studies was the use of empirical material. These studies were noted to be case studies or there was clearly one target organization, for which a tool was designed for. The tools themselves could be put in similar categories as the more literature-oriented studies: 1) *Decision/planning frameworks for designing or improving services*, 2) *Measurement tools*, and 3) *Mathematical planning tools for specific tasks*.

Papers with decision frameworks presented facilitation tools for such tasks as strategic profiling (Hill and Brown, 2007), process improvement (Greasley, 2004; de Treville et al., 2006; Piercy and Rich, 2009), service design (Karwan and Markland, 2006), and visualizing value co-creation in complex service enterprises (Mills et al., 2013).

The measurement tools included such tools as control charts for identifying potential problem areas in service processes (Sulek et al., 2006), a method for analyzing the operational benefits of e-service

strategy (Boyer et al., 2002), and a method for analyzing the performance of operating theaters for benchmarking purposes (Longo and Masella, 2002).

Papers presenting mathematical planning tools used modeling, simulation or optimization approaches for solving exact planning problems, such as capacity management (Adan and Vissers, 2002), resource management (Pasin et al., 2002), and delivery operations (Apte and Mason, 2006).

#### **4.1.5 Summary of the literature review results**

This review can be regarded as a suggestive description of what recent SOM research is, and how SOM research can potentially benefit the target organization. Instead of finding optimal solutions to exact decisions, the focus in OM research is more on managing processes and understanding the customer and service business as a whole. A relatively large proportion of the research seems to focus on defining SOM and its targets and concepts. Some traditional OM topics, such as demand forecasting, were missing from this sample.

The aim of this literature review was to summarize the typical managerial implications of service operations management (SOM) research on the basis of a sample of former studies. Below, potential managerial implications are categorized according to the extent of the implication. This categorization is used later in this paper when presenting the OM issues that were found in the case context.

#### **Analysis of relationships**

- Providing statistics about assumed relationships between specific decisions and organizational performance
- Providing statistics about the drivers of customer satisfaction
- Providing statistics for understanding customer behavior

#### **Descriptions**

- Describing the current state of a selected process
- Comparisons
  - in-organization comparisons
  - out-organization comparisons

#### **Tools**

- Presenting/developing mathematical models for optimization tasks
- Presenting/developing models for decision support
- Presenting / developing structural approaches to process improvement
- Presenting/developing assessment tools or measurement scales.

This classification helps to outline the potential benefits of OM research for the target organization. Such a classification can be used as a communication tool when designing future research projects that aim at improving the operational practices in the organization.

The literature review presented in this section describes past research, but it can be expected that the focus of research can change as time passes. Some authors have presented suggestions for how SOM research should evolve. Johnston (2005b) suggests that the research should focus more on the non-profit and voluntary sector because they are under-studied in relation to their importance (e.g. when measured by the proportion of GDP). Roth et al. (2003) suggest expanding the research

methodologies in order to understand service management. The authors suggest using e.g. event history analysis and cooperating with other disciplines. Berry and Bendapudi (2007) suggest topics for health care research and taking account of the behavioral impacts of operational decisions. To summarize, the suggestions imply that the research should focus on understanding the managerial reality in services, rather than focusing on issues that are familiar from the manufacturing domain.

## *4.2 Results of the case study*

This section summarizes first the results of the interviews and then the results of the GDSS session. The purpose of the interviews was to create a description of the current state of elderly home care and about the problems and improvement targets observed. We summarize the interview results by presenting a description of the performance of elderly home care and its assumed drivers, as well as list of problems observed in the two main processes. In the GDSS session the objective was to gather and prioritize suggestions for further improvement work. We summarize all the proposals set out, providing more details of the suggestions that were voted to be the most important ones.

### **4.2.1 Performance and its drivers**

Figure 3 presents the main relationships in the performance of elderly home care that were noticed in the interviews. It can be seen that the work of the public sector workers involved in the care is divided to two parts. There is planned care work that is consistent with the job description. It was reported that plenty of time is consumed in other tasks than actual care work. These include e.g. finding a doctor to get consultation, registrations, information search, and advising the customer in social insurance issues. To some extent, the time consumed in these tasks could be reduced with work planning and applying common rules and instructions.

Cost efficiency is the main concern in every organization, but the performance of elderly home care cannot be measured purely on financial measures. Customer wellbeing is a central issue, but measuring it is problematic. Customer satisfaction depends on customer expectations, which in this case were perceived to be often oversized. The customers may expect services (e.g. cleaning services) that are no longer provided municipally. The care workers reported that they have to work in a hurry, so that they cannot always devote enough time to the customers. Many elderly people suffer from loneliness, and it was reported that loneliness even causes groundless visits to the emergency unit, and that way it has also indirect cost-effects. Therefore, it is important to understand the drivers of customer well-being. Alcohol consumption, financial resources and social relationships have an impact on the well-being of the customer. When elderly home care is examined as a whole, these are issues that are discussed, even if they do not belong to the health care organization's responsibilities, or to traditional OM topics.

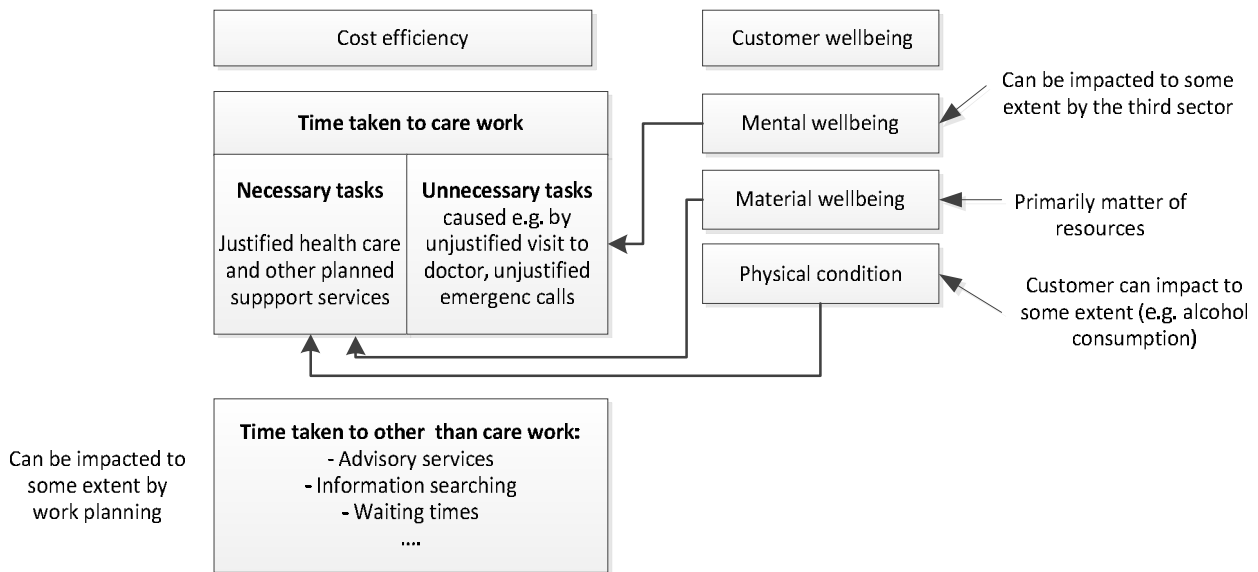


Figure 3: Primary goals of home care and the assumed main drivers of performance

The main point in presenting this figure is that it helps to understand the operation of elderly home care as a whole –what kind of tasks the work is perceived to be divided to, and what are the issues that are assumed to have impacts on the performance of home care. The relationships behind performance were not measured statistically, as it was not considered necessary at this point.

Elderly home care is a so called “out-patient” system, whereas hospital is an “in-patient system”. The in-patient system is a closed system in which the patients in the processes can be tracked, and it can be to some extent compared with a production unit. The out-patient system is an open system where the needs of the patient dictate the flow of events, and it cannot be fully controlled from outside. These characteristics determine largely the type of planning problems that are found in this context. The essential question is how to manage processes that are partly vague resource-efficiently.

#### 4.2.1 Fundamental processes and their development needs

Two substantial processes in home care were examined further: 1) *acute situations* (customer moves to institutional care from home care), and 2) *the process of transferring the customer into home care from institutional care*. Visual process descriptions were made using MS Visio. The problems or improvement areas in the processes that emerged in the interviews are listed below.

Elderly home care processes are not controlled by a single organization, but they involve different parties, as described in figure 1. Typically, when some problems are observed during operative work, the information about the problems is not passed to all parties. The interview round helped to form a complete picture of the most important processes and the typical problems encountered. After that it was possible to examine which ones of the problems could be facilitated by common operating models and guidelines.

Problems and development targets related to acute situations:

1. The customer is moved to institutional care in an ambulance, and the home care person does not receive information about this. Searching for the customer takes time.



2. A home care person makes a subjective (and possibly faulty) decision about the need of emergency care, as there are no agreed criteria and ways of action on when emergency care is needed.
3. The home care person needs consulting with a doctor, but does not reach one.
4. When discussing the condition with a doctor, the home care person does not have customer patient history available, and the information given to the doctor is based on memory.
5. All the doctors are not motivated, do not know the customers, or do not have geriatric expertise.
6. All doctors cannot or do not want to use the patient information system when deciding on the need of institutional care.

Problems and development targets related to the process of transferring the customer into home care from institutional care:

1. The customer needs to be moved to home care or some other institution because of lack of resources, even though the condition of the customer is poor.
2. The people deciding on the transfer to home care do not know the customer and do not know how the customer has managed at home.
3. It is unclear what kind of support services for home-living are available in different geographical areas.
4. It is common practice to move customers home for weekends, which causes a problem for the home care personnel, because there is less of them at that time. The home care personnel often get information about the arriving customer only a little beforehand.
5. Many customers are not in need of continuous hospital care, but are in need of continuous support and supervision. There are not enough home-like institutions.
6. When the customer is moved back home, a home care person is supposed to visit the customer at the same time. In some cases this is not possible and it may cause a feeling of insecurity for the customer.
7. Customers often have problems in acquiring e.g. cleaning services from private service providers, but the home care personnel is not allowed to select the service provider on behalf of the customer, or even recommend a specific service provider.

Basically, the problems observed can be divided to three categories: problems due to lack of resources, problems due to lack of common rules or instructions, and problems in information management. These results were presented to the participants of the GDSS session prior to the session.

#### **4.2.3 Results of the GDSS session – suggestions for improvement targets**

Suggestions for improvement targets were collected in the GDSS session, and the participants were provided with the results of the interviews before the session. Altogether 41 suggestions for improvement targets were listed. A complete list of suggestions in an abridged form is included in the Appendix. In our literature review, the potential managerial implications of SOM research were put into three main categories: 1) Analysis of relationships, 2) Descriptions and 3) Tools, and we used the same categorization in analyzing the case material. Many of the suggestions, e.g. 4) “Peer groups for caregivers” and 6) “Enhancing information technology skills” were of very practical nature. Their implementation would not require collecting or analyzing any kind of data, so they could not be categorized unambiguously by the research approach. Most of the suggestions that somehow fit in the categorization fell in the Descriptions category. Implementing e.g. suggestions 11) “A shared strategy and practices for field workers”, 23) “Reconstructing the home care process and work supervision as a whole” and 38) “Developing a common scheme for the discharging

process” would require qualitative descriptions of existing or potential practices. None of the suggestions concerned analyzing relationships. Suggestions 21) “Possibly differentiating the emergency phone alarm reception from other activities” and 35) “Rationalizing the geographical responsibility areas of night patrol” dealt with rationalizing work. In such exact problems, utilizing some planning tools, e.g. simulation approaches, could be of use. Suggestions 1) “Continuous comparison between service plan and fruition”, 2) “Key function measurement and assessment practices throughout the service activities” and 16) “Primary function measurement and evaluation practices” dealt with performance measurement, in which performance measurement tools are necessary.

After gathering the suggestions, the most feasible and influential development targets were voted for. When evaluating the influence, the participants judged on a scale from 1 to 10 how large impact the suggested change would have on the operation in the case context. When evaluating the feasibility, the participants judged on a scale from 1 to 10 how much resources the suggestion would require, 10 meaning that the suggestion would call for only very little resources. The scores were counted up, and the suggestions were sorted out according to the total scores. The results were presented to the participants in a visual form, and after that they were able to vote for three suggestions for further examination. The three suggestions are presented below:

**1. Thinking through the operations of different participants, e.g. emergency duty, night service, home care nurses**

This means developing cooperation models in such a way that more cases, e.g. giving intravenous antibiotics, can be managed in the customer's home. The customer will not be transported to a hospital by ambulance, if treatments can be provided directly at home. Developing models for these situations would reduce ambulance transport and congestion in on-call. Planning the operation models would require cooperation of different parties in home care.

**2. Increasing personnel resources, ensuring equal staffing to each shift**

This means transferring staff resources from institutional care to home care. Currently, home care does not have adequate staff resources, so if home care is to be emphasized, reorganization of resources is needed. Additional resources are needed in the transition phase, and the use of resources must be planned.

**3. Establishing the distribution of work and remote consulting for doctor-nurse pairs**

This means naming particular home-care doctors, and addressing the primary doctor for each customer. The care work is easier, when the doctor is familiar with the patients and their medical records and it is clear for the home care nurses which doctor should be contacted when consulting is needed.

As an output of the GDSS session, introductory project plans were made for implementing the development ideas. It was written down how much resources would be needed for implementation, who would be required to participate, what are the main milestones etc. The interview results implied that the observed problems were derived mainly from three root causes: lack of resources, lack of common rules or instructions, and problems in information management. Therefore it is logical that the top three development targets reflect these issues.

For the researchers, the GDSS session provided information on what types of development actions were considered important by the practitioners. The main benefit for the target organization was that the information about the problems and development targets were spread better, and the

prioritization of development targets was facilitated. In addition, it is generally known that it is easier to implement changes in work if the owners of the work feel that they have participated in the decisions about the changes.

## 5 Discussion

This study examined the managerial problems and development targets observed in improving home care. This section analyzes how this study differs from former SOM research.

This study used a systematical literature review to form a theoretical background for the case study. Typically, the literature reviews included in case study papers have a more limited scope. The reason for doing a wider literature review was that elderly home care is not a typical field for OM studies, so there is a lack of related papers. With the wider literature review, the theoretical contribution of this study is not limited to the area of elderly home care, but the study enhances understanding of the potential benefits of SOM research also for other target organizations that are networks of non-profit organizations similarly to elderly home care.

The literature review was made from the point of view of the target organization, whereas former literature reviews have favored the point of view of a theoretical topic content. Being so, the literature review presents a new classification of literature, which enhances understanding of the potential benefits of SOM research for the target organization, as well as of the prevalence of different research methods in SOM. When compared with OM research in the manufacturing context, SOM research puts less emphasis on exact planning decisions, where modeling and optimization approaches are applicable. A majority of studies examine the relationships behind performance and its drivers with statistical methods.

The case study mapped the managerial problems and development targets observed in organizing elderly home care, as well as their perceived importance. When these results are compared against the typical managerial contributions of SOM research, there is a clear difference between the focus of former SOM research and the managerial interest in the case company. Whereas a majority of former studies focus on providing statistical information, in the case company the focus was on developing cooperation practices and reorganizing the work; the statistical research approach was not perceived necessary, even though assumptions about the relationships behind performance were made. It is possible that statistical studies are emphasized in the literature because of the research tradition rather than their managerial importance. The case study results support this assumption. However, general conclusions cannot be drawn from a single case study.

When using the same classification as in the literature review, our case study can be regarded as a descriptive one, but it has also some characteristics of a design science study. For the target organization it provided a description of current practices and assumed relationships behind performance. This description may be of use when the operation of the case context is communicated to other parties, e.g. to the administration or to the public. In this case, the main benefit for the management was that the researchers facilitated the process of listing and selecting improvement targets. Further, the development emphasis on cooperation practices and reorganizing the work in the case company was logical, as it was going through large scale organizational changes at the time of the research. The researchers applied a structured approach for this decision process and applied GDSS tools. In this case it seemed that optimization approaches could be possible in the future if more specific areas for development are worked with.

One main difference between our case study and former SOM case studies is the type of service and the type of organization providing it. Elderly home care is not a simple service process provided by a single organization, but rather a series of activities provided by a network of not-for-profit organizations. As such, this case study enhances understanding of the managerial reality of different types of service organizations.

## 6 Conclusions

This paper focused on exploring what kind of operational level problems there are in organizing home care services for the elderly, and how they relate to the issues that have been typically discussed in recent SOM research. Former SOM literature was categorized by its main managerial contribution, and the same categorization was used for classifying the OM issues found in the case context.

The first research question was: *What are the typical managerial implications of service operations management (SOM) research?* The conducted literature review suggested that a major part of the research demonstrates statistical relationships between in-company characteristics and organizational performance. A significant proportion of case studies are different types of descriptive studies. A relatively small number of studies deal with finding optimal solutions for specified tasks. Therefore the traditional, function-based classification for OM topics is not necessarily suitable for presenting the contents of SOM research. Instead, this study presents a new way to classify case studies on the basis of the benefit offered to the target organization. A similar classification can be applied in future literature reviews, and it may help SOM researchers to position their own research better in the area of SOM from this perspective.

The second research question was: *What kind of issues are there in organizing home care for the elderly, and what is the role of SOM research in mitigating those issues?* The main finding was that there is room for improvement mainly in the processes, in analyzing the processes from the point of view of different parties, developing common rules or schemes, and clarifying responsibility distribution. The main managerial implication of this case study for the target organization was that it facilitated listing and prioritizing development targets.

The main limitation of this study is that the empirical material comes from a single case study, so we cannot conclude how common the observed managerial problems are. However, the generalizability of this issue was not a particularly important objective in this paper. Rather, the objective was to analyze how the OM theory is and can be applied in practice in the service environment. The case environment, elderly home care, served as an example of a rather new application area of the OM theory. The results of our literature study imply that there is room for more case studies that originate from the development needs of service organizations. Only such research can enhance understanding on the applicability of the theory.

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Results of the GDSS session: Suggestions for improvement targets

1. Continuous comparison between service plan and fruition
2. Key function measurement and assessment practices throughout the service activities
3. Making use of the customers' own resources
4. Peer groups for caregivers
5. Peer groups for the bereaved
6. Enhancing information technology skills
7. Skills development to meet the operational needs (including future needs)
8. Particularizing job descriptions
9. Addressing a central manager for each work shift of home care
10. Ensuring enough time for doctors and nurses
11. A shared strategy and practices for field workers
12. Storage and transmission of tacit knowledge
13. Expanding the knowledge requirements
14. Increasing the rehabilitation know-how
15. Increasing the number of discharge nurses
16. Primary function measurement and evaluation practices
17. Enabling easier access to medical records
18. Enabling real-time access to operational data
19. Enhancing information sharing between different parties involved in the care of customers
20. Increasing the transparency of activities
21. Possibly differentiating the emergency phone alarm reception from other activities
22. More active cooperation with the third sector in organizing social programs
23. Reconstructing the home care process and work supervision as a whole
24. Introducing a tool for home care field force management
25. Reducing indirect workload
26. Guiding customers to a health centre or pharmacy, if medicine distribution is the only service needed
27. Introducing technical devices
28. Using phones in home care
29. Utilizing mobile technology in the customer's home
30. Utilizing technical safety systems
31. Increasing the use of assistive devices
32. Thinking through the operations of different participants, e.g. emergency duty, night service, home care nurses
33. Expanding the operations of caregiver support centre
34. Increasing the amount of dementia expertise
35. Rationalizing the geographical responsibility areas of night patrol
36. Developing social daytime activities
37. Increasing personnel resources, ensuring equal staffing to each shift
38. Developing a common scheme for the discharging process
39. Increasing cooperation and sharing goals
40. Establishing the distribution of work and remote consulting for doctor-nurse pairs
41. Finding out if the work distribution between nurses, practical nurses and bachelors of social services can be enhanced