Serving specialized patient segments in a diversified context

A knowledge perspective on the case of Karolinska University Laboratory

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ABSTRACT

Healthcare delivery is complex, involving numerous organizational units organized according to medical skills or specializations, which do not reflect the boundaries within which value is created. This fragmentation leads to a lack of holistic view of the value-creating activities within the care delivery process. Therefore, healthcare organizations are aligning and integrating care processes horizontally, moving from functional and hierarchical structures towards more patient centred processes. The concept of value-based healthcare suggests a maximized value creation to occur when optimal conditions are created for selected patient segments, integrating all activities that jointly determine the success in meeting a set of patient needs.

While targeting specialized segments has been shown to be beneficial both within and without the healthcare setting, theories of diversification suggest that an increased scope may be an even more efficient approach to improve performance. By sharing resources and capabilities across several specialized areas, an organization is subject to even higher value-creation due to economies of scale, scope and other spillover effects. In this study, we examine how an ancillary service function, providing resources and capabilities that are shared across specialized units, can be organized to ensure contribution to the overarching goal of maximizing value for patients. With this focus, we wish to provide a deeper understanding of how an ancillary service function can be organized to support the value creation in a diversified hospital.

A case study is conducted of the Karolinska University Laboratory, the laboratory function of the Karolinska University Hospital. The hospital is implementing a new value-based operating model organized around the patient’s journey through healthcare, integrating expertise horizontally in patient flows, but with ancillary services organized as shared resources across the specialized patient flows. In the new operating model, representatives from all activities involved in the full care cycle meet to discuss the long-term value creation of a patient flow, forming a network where knowledge is being shared and integrated. This study therefore takes a knowledge perspective by analysing operational strategies of healthcare along with knowledge networks and management, applying existing theoretical concepts to data collected through qualitative interviews with laboratory employees. Empirical findings show that the laboratory has developed a structure for participation in the long-term development of each patient flow. However, a structure to assimilate the knowledge obtained is still lacking. It is concluded that an ancillary service function can, in a diversified context, facilitate and support the value creation around medical conditions by developing a comprehensive structure for knowledge management and sharing, both externally towards medical conditions and internally within the ancillary service function. If structured properly, clear benefits, such as economies of scale, scope and knowledge spillovers, can be achieved by separating sharable resources from the patient flows. A complementary strategy is however still needed regarding how to integrate and coordinate the knowledge needed by many different patient flows in a diversified context, where this case study acts as a basis of understanding in forming such strategy.

Keywords: value-based healthcare, related diversification, specialization in healthcare, focus in healthcare, network theory, knowledge management, ancillary service function, integration, coordination, hospital, process orientation, healthcare management
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LIST OF ABBREVIATIONS

KUH          KAROLINSKA UNIVERSITY HOSPITAL
KUL          KAROLINSKA UNIVERSITY LABORATORY
MGMT         MANAGEMENT LEVEL RESPONDENTS
PF           PATIENT FLOW
PFMT         PATIENT FLOW MANAGEMENT TEAM
SPOC         SINGLE POINT OF CONTACT
VBHC         VALUE-BASED HEALTHCARE
1. INTRODUCTION

1.1. CHALLENGES AND OPPORTUNITIES IN HEALTHCARE

Healthcare organizations have long faced problems with an increased demand and economic constraints, resulting in an increased pressure to reduce costs and improve operating efficiency in a field with extreme quality requirements (Huckman & Raman, 2015; Porter, 2009). An issue that has drawn much focus is therefore the need for healthcare organizations to find ways to successfully achieve a higher efficiency without sacrificing quality (Kumar & Ozdamar, 2004). Healthcare delivery is complex, involving numerous organizational units organized according to medical skills or specializations, which often do not reflect the boundaries within which value is created (Lee & Clarke, 1992; Porter, 2010). The fragmentation and lack of holistic view lead to a lack of control and coordination of the value-creating activities within the care delivery process (Nyssen, 2007; Vos et al., 2011).

To improve their operations, healthcare organizations around the world have started adopting management principles and techniques initially developed for manufacturing and service industries. The focus of improvement strategies has thus shifted from functional and hierarchical structures towards organizational processes, where healthcare organizations are aligning and integrating their care processes horizontally (Hellström et al., 2010; Langabeer et al., 2009; Walston et al., 2004). Structuring the care delivery process as a service business process will enable the optimization of healthcare delivery performance (Parnaby & Towill, 2008). Aligning and integrating care processes horizontally will lead to a more patient-centered care, achieving a higher efficiency as well as quality improvements (Kohlbacker, 2010; Vera & Kuntz, 2007).

To achieve a more patient-centered care, a shift is required from today’s silo structure, organized in specialty departments, to organizing care around the patient's medical condition (Porter & Lee, 2013). Porter and Teisberg (2006) introduced the management concept of value-based healthcare (VBHC) as a strategy for healthcare reform. VBHC was introduced to shift the focus of U.S. healthcare providers towards a value-based competition with the goal to maximize the patient's value over the entire care cycle. By organizing care around medical conditions, described as an interrelated set of medical circumstances such as breast cancer or diabetes, healthcare delivery will take a holistic approach including all services or activities that jointly determine success in meeting a set of patient needs (Porter, 2010). By organizing care into an integrated practice unit focused on a particular medical condition (Porter & Lee, 2013), a dedicated team can follow patients over time, enabling them to develop the expertise needed to maximize the patient's value over the entire care cycle (Lee, 2016; Porter & Lee, 2013).
However, to achieve VBHC “institutions are expected to narrow the range of medical conditions served, or at least the types of cases they seek to address” (Porter & Teisberg, 2006, p. 160). By specializing on specific medical conditions to cater to, optimal conditions can be created allowing a higher value of the patient's overall outcomes (Porter & Teisberg, 2006). Targeting specialized segments has long been shown to be a successful strategy, both within and without the healthcare setting (Davidow & Uttal, 1989; Herzlinger, 1996; Heskett, 1986; Skinner, 1974).

Although there are clear reasons to specialize and to target specific medical conditions, it is however also suggested that diversification and an increased scope may be an even more efficient approach to improve performance (Clark & Huckman, 2012; Panzar & Willig, 1981; Teece, 1980). An organization's total value can increase by gathering many related specialized units, which overall are distinct, creating a diversified organization. Specializing in several areas can lead to economies of scale, scope and other spillover effects, by allowing resources and capabilities to be shared across several focused operating units (Clark & Huckman, 2012). Although theory of VBHC suggests that all needed expertise should be integrated within a focused operating unit, theory of diversification suggests that an even higher value can be attained by letting resources and capabilities be shared across several focused operating units.

1.3. THE NEED FOR A COMPLEMENTARY STRATEGY

Although there are different approaches to value creation, theory regarding care delivery is focused on the care delivery process in isolation, leaving out the value creation supported by resources and capabilities placed outside of the main delivery system. This value creation may in a hospital be supported by ancillary services providing resources and capabilities needed by many different patients along their healthcare journey, regardless of medical condition, such as X-ray, physiotherapist or laboratory services. Focused operating units may therefore be supported by multiple ancillary services in the value creation (Lathrop et al., 1991).

It is argued that the greatest benefits of integrating a complex healthcare organization are achieved only when the patient is placed centrally throughout the whole organization, including ancillary services. Integration and coordination of ancillary services that are shared across specialized units thus become critically important (Kumar et al., 1993). A common mistake when developing focused operations is to focus solely on what fits into a focused operating unit, forgetting to express a strategy of how to integrate what remains (Huckman, 2009).

VBHC presents clear opportunities with integrated practice units targeting selected patient segments, but it does not provide a strategy on how to organize what is better managed as shared inputs across several units. VBHC therefore does not provide a strategy on how to apply the concept in a diversified context. With the objective of providing a holistic approach to maximizing the patient's value, a complementary strategy is needed regarding how to organize and coordinate activities that contribute to the success in meeting a set of patient needs, while still benefiting from being shared across the organization.
1.4. THE KAROLINSKA UNIVERSITY HOSPITAL AND ITS LABORATORY

In this paper, we will study the Karolinska University Laboratory, hereafter KUL, an ancillary service function of the Karolinska University Hospital, hereafter KUH. Just as many healthcare organizations, KUH has long had problems with an organizational silo mind-set and therefore a lack of holistic perspective, along with constant economic constraints. In order to turn these difficulties in a positive direction, KUH is implementing an operating model based on the patient’s journey through healthcare. Care at KUH is being organized around the special needs of over a hundred nominated patient flows, hereafter abbreviated as PF, consisting of patients with similar medical conditions and hence a need for similar expertise throughout the patient’s healthcare journey.

Related PFs are gathered into seven medical Themes that wards, departments and outpatient care units are organized according to. The Themes are supported by five ancillary service Functions, where competences and resources are gathered and available to all Themes. Functions are organized across the specialized PF’s, facilitating value-creating activities that, combined with other activities along the patient’s journey, determine the success in meeting the patients’ needs.

Figure 1. The structure of the new value-based operating model at the Karolinska University Hospital (KUH, 2017a).
Previously at KUH, a patient’s journey through healthcare could move from one department to another, without maintaining a holistic view of the journey. In the new value-based operating model, with expertise organized horizontally, each PF has been assigned a Patient Flow Manager that is responsible for the PF’s overall health outcomes and the activities required for meeting the patient needs. The main difference is therefore that needed resources do no longer need to be collected and allocated towards the patient as it moves between different stages in its healthcare journey, but rather resources are now employed and bound to a certain PF that constitute the patient’s journey through healthcare. What is still needed to be vertically integrated in order to fully meet the patient’s needs, however, is the ancillary services.

For each PF, all expertise that jointly determines health outcomes is gathered in a Patient Flow Management Team, hereafter PFMT. In the PFMT, representatives from all activities involved in the full care cycle meet to discuss the long-term outcomes of the particular PF. The team is intended to meet regularly to share and integrate knowledge and to take part in joint problem-solving activities, in order to ensure holistic value creation towards the PF. Information regarding the new value-based operating model, Themes, Functions, PFs and the PFMT, is found in internal documents by KUH (KUH, 2015), working material by KUL (KUL, 2016), and updated information provided by the hospital’s website (KUH, 2017a).

Despite the development of a forum for knowledge sharing across organizational boundaries, focus in the new operating model has evolved around structuring care according to medical conditions. KUH is implementing a new operating model influenced by VBHC, which we suggest lack a complementary strategy of how to integrate and coordinate the knowledge needed by many different PFs. We will in this thesis examine how the laboratory function of KUH, KUL, has adapted to the new operating model and organized its links to each PF, to provide the laboratory specific skills and knowledge needed in order to maximize patient value.

1.5. PURPOSE AND RESEARCH QUESTION

VBHC calls for a shared accountability for the value creation, where integration and coordination between value-creating activities become crucially important. The purpose of this thesis is to examine how an ancillary service function, providing resources and capabilities that are shared across specialized units, can be organized to ensure contribution to the overarching goal of maximizing value for patients. With this focus, we hope to approach both the theoretical gap and managerial problem presented in this chapter.

By conducting a case study of KUL, we try to understand how an ancillary service function, in the context of a diversified hospital, can create a structure that ensures sufficient integration with each medical condition, whilst organized across several integrated units.

We therefore pose the question:

How can an ancillary service function, in a diversified context, facilitate and support the value creation around medical conditions?
1.6. THEORETICAL AND METHODOLOGICAL APPROACHES

To provide an answer to this question, we examine the diversified context of KUH, the ancillary service function KUL, and KUL’s facilitation and support of value creation around medical conditions. In the new value-based operating model of KUH, the long-term value creation around medical conditions occur within the PFMT. This team meets regularly to discuss the long-term outcomes of a particular PF, forming a network where knowledge is being shared and integrated. In this particular case, the ancillary service function’s management of knowledge back and forth the knowledge network becomes important in order to facilitate and support the value creation around medical conditions, and to ensure contribution to the overarching goal of maximizing value for patients.

To examine how an ancillary service function, in a diversified context, can facilitate and support the value creation around medical conditions, this study therefore takes a knowledge perspective.

By examining the case regarding (1) the strategies of the new value-based operating model, (2) the knowledge network formed by the PFMT and the laboratory’s link to it and (3) the management of knowledge, this study provides an analysis of the structural prerequisites for the laboratory to share and distribute important knowledge in order to facilitate value creation. From such analysis, a discussion can be held, and conclusions can be drawn, regarding how an ancillary service function, in a diversified context, can facilitate and support the value creation around medical conditions.

1.7. OUTLINE OF THESIS

In the next chapter, a literature review is provided focusing on (1) operational strategies of healthcare, (2) knowledge network and (3) knowledge management and sharing. This is followed by an overview of the research methodology. The empirical setting and research design of the study are presented, describing how existing theory is applied to the empirical setting, where semi-structured interviews are used to gather data. In the fourth chapter, the data will be presented and analysed in an integrated manner, connecting empirical data to theoretical concepts thematically. This is followed by a discussion of the main findings from the study. Lastly, conclusions will be presented in order to answer the research question stated above.
2. LITERATURE REVIEW AND THEORETICAL APPROACH

2.1. OPERATIONAL STRATEGIES OF HEALTHCARE

2.1.1. Hospital process orientation

Healthcare delivery is complex, involving numerous organizational units organized according to medical skills or specializations, which do not reflect the boundaries within which value is created (Lee & Clarke, 1992; Porter, 2010). The fragmentation and lack of holistic view lead to a lack of control and coordination of the value-creating activities within the care delivery process (Nyssen, 2007; Vos et al., 2011). To improve their operations, healthcare organizations around the world have started adopting management principles and techniques initially developed for manufacturing and service industries. The focus of improvement strategies has thus shifted from functional and hierarchical structures towards organizational processes (Hellström et al., 2010; Langabeer et al., 2009; Walston et al., 2004). By focusing on processes and applying process-oriented performance indicators, members from different departments are encouraged to collaborate to achieve common goals (Gemmel et al., 2008).

2.1.2. Value-based healthcare

Value-based healthcare (VBHC) was introduced as a strategy for maximizing the patient's value over the entire care cycle, with value defined as health outcomes per dollar spent (Porter & Teisberg, 2006). By organizing care into integrated practice units focused on a particular medical condition, a dedicated team can follow patients over time, enabling them to develop the expertise needed to maximize the patient's value over the entire care cycle (Lee, 2016; Porter & Lee, 2013). With all activities that jointly determine success in meeting a set of patient needs integrated and adjacent to the particular medical condition, organizations are required to select the types of cases they want to focus on and thus narrow the range of medical conditions. By specializing on target patient segments, optimal conditions for a specific patient segment can be created allowing a higher value in the patient's overall outcomes (Porter & Teisberg, 2006).

The use of focus and specialization as a mechanism for quality improvement and cost reduction has previously been proved successful both in the manufacturing (Skinner, 1974) and service industry (Heskett, 1986), but also in the healthcare context, through focused operations (Herzlinger, 1996) and segmentation of patients (Davidow & Uttal, 1989). Targeting specialized segments has thus been shown to be beneficial both within and without the healthcare setting.

2.1.3. Specialization and diversification in healthcare

Although there are clear reasons to specialize healthcare delivery and to target specific medical conditions, there are other strategies to achieve value in terms of quality improvements and decreased costs. Though a focus on a smaller scope forms the benefits of specialization, it is suggested that diversification and an increased scope may be an even more efficient approach to improve performance. In fact, it has been argued that a broader range of
activities could increase value of the organization (Panzar & Willig, 1981; Teece, 1980), especially when expanding scope into related businesses (Clark & Huckman, 2012; Rumelt, 1974). A diversified healthcare provider consisting of several highly focused operating units of medical conditions that are related yet diverse, may achieve higher value than a health provider focusing exclusively on one selected target market (Clark & Huckman, 2012).

An organization with a broad range of related activities can benefit from economies of scale by sharing common resources and capabilities across operating units. By sharing fixed costs or investments across many segments, a lower cost per segment can be achieved. Also, organizing activities across specialized units allows economies of scope and a deepened know-how of generic attributes to develop, when managed as a shared input serving a variety of segments. Knowledge produced by one specialized unit may thus contribute to quality improvements also in other units, if a shared input is improved (Clark & Huckman, 2012; Teece, 1980).

Quality improvements of one activity can help improve the marginal performance of a related activity also when it comes to less generic attributes. A hospital’s specialization into related medical conditions can achieve internal knowledge spillovers between specialized units, when an improved performance in one patient segment contributes to developing the care provided to a patient segment of related medical circumstances (Clark & Huckman, 2012).

An organization’s total value can, according to this, increase by gathering many related specialized units, which overall are distinct, creating a diversified organization. With related diversification, it is possible for an organization to contain several related yet distinct operating units, each with a very focused task or set of activities, and yet achieve a high value. When diversification exists at an organizational level, high value can thus be achieved even as individual operating units remain highly focused. When implementing focus and specialization in healthcare, it is therefore beneficial to “look beyond their focal activity to build strong capabilities in complementary areas” (Clark & Huckman, 2012, p. 720). In doing so, an organization is also approaching the vision that Porter and Teisberg have, regarding organizing the care delivery to include “all needed specialties and the prevalent comorbidities” (Porter & Teisberg, 2007, p. 1104).

2.1.4. Cross-functional structures

To better coordinate the activities in a complex organization, an organization can either reduce the need for information processing, or increase the capacity to manage information (Galbraith, 1973). Organizing care into integrated practice units limits the need for information processing since all needed resources are integrated into one autonomous department (Lathrop et al., 1991). However, maintaining several specialized areas in a diversified context also requires an increased capacity to manage a large amount and variety of information. In order to increase the capacity to manage information, the development of more integrated information systems is required (Kumar et al., 1993). A matrix organization is intended to increase the ability to manage more information by allowing functional and process responsibilities to interact with each other, while supporting a focus on processes rather than functions and thus reduces the need for information processing (Ford & Randolph, 1992; Virtanen, 2017).
A primary driver to the matrix organization is the pursuit of a multiple-priority strategy, such as putting equal priority on different functions within the organization that are required in the value creation process. One example of this is the sharing of specialized and expensive resources in a diversified hospital. A specialist might be needed in the production process of a product or service, but devoting specialist to specific products or services is expensive and the specialization might be best developed if the specialists are gathered in functions. Likewise, equipment can be expensive and it might not be optimal to invest in identical equipment for several production units. Sharing resources across the organization may therefore improve an efficient use of resources, by maintaining functional disciplines task oriented and technically innovative while allowing projects to benefit from the use of functional economies of scale (Ford & Randolph, 1992).

However, in order to achieve a fully integrating healthcare organization, Kumar et al. (1993) argue that it is important to put the efficiency of flows of medical conditions above resource utilization. The greatest benefits of integrating a complex healthcare organization are thus achieved only when the patient is placed centrally throughout the whole organization. This is true only when ancillary services consider their final output to be the value delivered to the patient, rather than an intermediate product or service, e.g. a laboratory delivering a laboratory analysis.

Although a matrix organization enables flexibility through both a reduced need of, and an increased capacity for, information processing, it may be both complicated and difficult to implement (Galbraith, 2008). The increased contact among departments allows information to soak into the organization, but also requires careful consideration of how knowledge is created and transferred across the organization (Gemmel et al., 2008).
2.2. KNOWLEDGE NETWORK

2.2.1. Coordinating value-creating interactions

In order to leverage the organization’s capability to discover and respond to value-creating opportunities, activities need to be integrated across specialties (Kohli & Jaworski, 1990; Narver & Slater, 1990). Opportunities can arise all over the organization and the more areas that are involved in this process of knowledge sharing, the more varied sources of expertise are combined which increases the chances to uncover new innovative ideas (Hauser & Clausing, 1988; Lambert & Garcia-Dastugue, 2006).

If different specialties share their knowledge about the patient, they can together develop a fuller understanding of the patient needs. Through interactions with the rest of the organization, specialties gain insights about the others’ specific needs and difficulties. They can use their knowledge to identify opportunities, to design better offerings, and discover constraints that could put the delivery of the offering at risk (Lambert, 2008). The exchange of ideas between people with different perspectives may thus result in solutions that would not have come up under other circumstances.

2.2.2. A knowledge network

Value creation can be described as something that occurs not in sequential chains but in complex constellations (Normann & Ramírez, 1993), forming a network of numerous and possibly complex interactions between entities. The healthcare environment is characterized by significant technical complexity, both when it comes to patient conditions and organizational structure. There is thus a need to coordinate the many different actors who may be involved and responsible for the scope of value-creating activities occurring within the hospital (Sampson et al., 2015).

Organizational units can be seen as parts of a network that is coordinated through processes of knowledge transfer and resource sharing (Galbraith, 1977; Gresov & Stephens, 1993), which enables organizational units to gain critical competences, and to create an organizational knowledge that is greater than the sum of the isolated parts (Tsai, 2001). Inter-unit network links is an important part of a learning process, since it enables horizontal knowledge transfer (Tsai, 2001). Within the network perspective of organizational learning, there are two major concepts. The first is the network position, which refers to a unit’s location within an inter-unit network and describes its level of access to knowledge, or the number and quality of links a unit has to other units. The second is the absorptive capacity and refers to the unit’s ability to assimilate and replicate new knowledge gained externally. It is the combination of the two that determines the effectiveness of inter-unit learning and knowledge transfer. A unit may have a very central network position and therefore have access to new knowledge from many other units, but might not be able to increase its innovation and performance due to this increased knowledge access if it does not have enough capacity to absorb it (Cohen & Levinthal, 1990; Tsai, 2001). Research shows that the interaction between network position and absorptive capability significantly affect organizational units’ innovation and performance, which thus suggests that, when extending network links, it is also critical to invest in absorptive capacity since it is the combination of the two that contributes positively to performance (Tsai, 2001). Network theory thus draws a clear line between making knowledge available to other units of the organization, and other units’ ability to assimilate the knowledge and put it to use.
2.3. KNOWLEDGE MANAGEMENT AND SHARING

2.3.1. Knowledge management

Within healthcare, knowledge is created in the interactions between health professionals, and between health professionals and patients (Armstrong et al., 2007). In order to obtain a successful knowledge network, a fluent information flow and a sharing of this knowledge is therefore necessary, and thus also sophisticated knowledge management. Knowledge sharing is partly dependent on employees’ motivation to share knowledge and partly on the organization’s ability to transfer knowledge (Karamitri, 2017).

2.3.2. Motivation and ability to share knowledge

In order to motivate employees’ knowledge sharing, leaders should envision the success of the organization and support the implementation of knowledge management. Their practices and behavior are shown to be major factors for the success of knowledge sharing (Liu et al., 2012). They should encourage a problem-seeking and problem-solving culture within the healthcare unit (Sánchez-Polo & Cegarra-Navarro, 2008), entertain the spirit of learning and constant improvement (Chang et al., 2009), and eliminate distrust (Kümper et al., 2006).

Another aspect of motivation is the role of appropriate evaluation and reward systems, in order to stimulate or foster cooperation between functional areas (Good & Schultz, 1997).

Knowledge sharing also depends on the means by which knowledge is physically possible to transfer. The ability to transfer knowledge depends partly on the existing networking possibilities, referring to the interactions between individuals or groups that otherwise would not meet or collaborate (Sylla et al., 2012), and on the available information technology (Karamitri, 2017). One obstacle for knowledge transfer is the amount and quality of the information available. Sometimes, information is precise and adequate (De Lusignan et al., 2005), but sometimes too much information is available (Dobbins et al., 2004). A so-called knowledge audit can be conducted as a precursor to the introduction of a knowledge management strategy (Webb, 1998). A knowledge audit examines the existing knowledge systems within an organization, such as sources of data, information and knowledge. It determines how these sources support its functions and its overall objectives, by identifying if they are available and how are they used. A knowledge audit also includes an investigation of the perceptions of unmet needs, and whether these needs can be met through relocation of existing resources, or if they must be retrieved externally (De Lusignan et al., 2005).

Time restrictions may be perceived as another major obstacle within the healthcare sector. Public health employees are documented not to lack the motivation or the means for knowledge sharing, but rather that they do not have the time to share or process the information needed (Dobbins et al., 2004; Kümper et al., 2006).
2.4. ANALYTICAL FRAMEWORK

Value creation in a healthcare organization occurs in complex constellations, forming a network of numerous and possibly complex interactions between entities. To identify opportunities of how to increase patient value, value creation needs to be based on a broader set of skills and competences, integrating all actors responsible for the scope of value-creating activities. In order to actually achieve maximized patient value, it is important that knowledge is shared among all actors, but also that the knowledge shared throughout the organization is used. Knowledge must therefore be managed properly, and an organization must enable and motivate employees to share their knowledge.

In the new value-based operating model of KUH, the long-term value creation around medical conditions occur within the PFMT. This team meets regularly to discuss the long-term outcomes of a particular PF, forming a network where knowledge is being shared and integrated. In this particular case, the ancillary service function’s management of knowledge back and forth the knowledge network becomes important in order to facilitate and support the value creation around medical conditions, and to ensure contribution to the overarching goal of maximizing value for patients. To examine how an ancillary service function, in a diversified context, can facilitate and support the value creation around medical conditions, a knowledge perspective is necessary.

By examining the case regarding (1) the strategies of the new value-based operating model, (2) the knowledge network and (3) the management of knowledge within this network, this study provides an analysis of the structural prerequisites for the laboratory to share and distribute important knowledge in order to facilitate value creation. The thematised structure of this literature review thus forms the analytical framework used throughout the rest of this study.
3. EMPIRICAL SETTING AND RESEARCH DESIGN

3.1. EMPIRICAL SETTING

In the spring of 2015, KUH started the development of a new operating model. What enabled this action was new extensive investments from the Stockholm County Council in, what they themselves called, the Healthcare of the Future, motivated by the raised demand on healthcare. The aim with KUH’s new operating model is to turn problems with fragmented care processes and a lack of holistic view in a positive direction. This includes the whole hospital, both the main Solna and Huddinge sites, and other minor geographical locations. The hospital claims that VBHC is being implemented with the objective to maximize value for the patient. To achieve this, the hospital is organized into inter-professional and inter-disciplinary teams centered around medical conditions. The aim is to further integrate care with research and education, and relevant outcome and cost measurements have been developed (KUH, 2015). As presented in the introduction, the resulting model is divided into Themes and Functions, and in this study we will investigate how one such Function can be organized in order to facilitate and support the value creation around the medical conditions. A case study has therefore been conducted on the laboratory of KUH.

Throughout the hospital, approximately 15 800 people are employed (KUH, 2017b) and about 2 200 of them work in the laboratory (KUL, 2017). However, it is important to keep in mind that the implementation of the new operating model is a work in progress, since both Themes and Functions are now being implemented. Therefore, this study is to a large degree a snapshot of the current state of the implementation. Upon completing this study, two Themes and all five Functions are run according to the new operating model.

3.2. PHILOSOPHY OF SOCIAL SCIENCE

This study aims at creating an understanding of how an ancillary service in the context of a diversified hospital can create a structure that ensures sufficient integration with each medical condition, whilst organized across several specialized units. In order to create this understanding, a qualitative case study is conducted. According to Bryman (2001), qualitative research is based on the desire to interpret and understand. This interpretivistic epistemology is applicable in our research since we claim that coordination and integration of knowledge, the main subjects to our study, are socially constructed. We do not claim that there is a predefined structure for knowledge management within the case organization that can be objectively dismantled at anytime by anyone, as is the basis of a positivistic epistemology. Rather, our literature review is subjectively chosen and is therefore a selected way of observing and analysing our case, and will therefore contribute to certain data with associated analysis and conclusions, apart from others.

Likewise, our ontological stance is idiographically oriented. Our main objective of analysis is coordination and integration of knowledge in order to facilitate value creation, which can be considered to be an organizational or structural phenomenon, and there within more nomothetically oriented. However, we consider the fundament of integration and coordination to be communication between parts of an organization, and in the end between people, and are therefore socially constructed.
3.3. RESEARCH DESIGN

3.3.1. A case study

In order to reach our aim, a specific healthcare organization that is implementing a new cross-functional operating model is examined. Since this implementation is one of a kind, it falls naturally to conduct a case study in order to create an in-depth understanding of it. The objective is thus to understand the case itself through interpretation of data, which according to both Stake (1995) and Creswell (2007), is the original purpose of case study research.

However, it is also important to have the limitations of case studies in mind. First of all, a common criticism of case studies is the lack of generalization (Farquhar, 2012): we will not be able to directly translate our findings to other situations. But a case is not a sample of one, rather a unique context (Bryman & Bell, 2003). Our aim is not to generalize findings of a sample to a population, but rather to obtain an awareness of how a deep understanding of our case can contribute to knowledge in the field. We have identified theory that will help us create an understanding of the case and its organizational setting. Our contribution is the application of theory on, and thus the creation of understanding of, a specific case in a certain context.

Another limitation with qualitative case studies is the lack of objectivity. Objectivity is obtained when there is a distance between the researcher and the units of study, which can be achieved with for example surveys. A case study can include surveys, but the aim here is the in-depth understanding of a phenomenon in its context, and therefore objectivity is not prioritized (Remenyi et al., 1998). Since our dominant epistemological research approach is interpretivistic, a closer engagement with the phenomenon is required, that takes into account the distinctiveness of humans (Bryman, 2001). Therefore, the aim is not to achieve complete objectivity, but instead to strive for neutrality and transparency (O’Leary, 2004).

3.3.2. The selected case

KUL is one of the ancillary service functions at KUH that has been facing least changes in the internal processes in order to adjust to the new operating model and the requirements of the new PFs. For other Functions, extensive changes in core processes have been essential in order to fit into the new model, so the changes there have been more pervasive. Moreover, for some Functions, the old organizational structure has not completely coincided with the new structure. Therefore, some organizational structures have been split up or restructured in order to adapt to the new model. The laboratory, however, is maintained intact. We therefore select KUL as our object of study, since the separation of the activities regarding changes in internal processes and the activities regarding adjustments to the new operating model is possible, and we can therefore focus on the latter to a larger extent in isolation.

Another argument for choosing KUL as the object of study is its clear representation in the PFMT through the Single Point of Contact, hereafter abbreviated SPOC. This clear intention creates an interesting starting point when studying how an ancillary service function, such as a laboratory, actively facilitate and support the creation of value around medical conditions. One last argument for the selection of the case is our personal contact with KUL, after spending a semester as interns supporting the business developers. This experience creates a deeper
understanding for both the laboratory organization and the new operating model, which is of value for the study. It has also facilitated access to respondents for the data generation. The selected case is therefore, to some extent, a convenience sample (Sekaran, 2000).

Our pre-understanding can affect our interpretation of data, due to our subconscious wish to see things in a certain way. However, with an interpretivistic approach, we recognize that individuals are complex and have different understandings of the same objective reality. Therefore, there are no positivistic facts that can be incorrectly interpreted, but rather only subjective beliefs. Nevertheless, we strive to be as neutral as possible by inviting respondents based on objective criteria and solely presenting data retrieved from the interviews (see 3.4.1.), not from previous experiences.

3.4. DATA GENERATION METHOD

3.4.1. Interview groups

The data is generated through interviews with KUL employees. The respondents are gathered into two groups, representing a strategic (MGMT) and a practical (SPOC) level, as shown in Table 1.

<table>
<thead>
<tr>
<th>RESPONDENTS</th>
<th>INTERVIEWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP</td>
<td>ROLE</td>
</tr>
<tr>
<td>Management (MGMT)</td>
<td>KUL Function Manager</td>
</tr>
<tr>
<td></td>
<td>Business Developer</td>
</tr>
<tr>
<td></td>
<td>HR Manager</td>
</tr>
<tr>
<td></td>
<td>IT Manager</td>
</tr>
<tr>
<td></td>
<td>Function Area Manager</td>
</tr>
<tr>
<td></td>
<td>TOTAL MGMT</td>
</tr>
<tr>
<td>Single Point of Contact (SPOC)</td>
<td>TOTAL SPOC</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
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</table>

Table 1. Presentation of the interview groups and respondents.

The study is descriptive with the objective to create an understanding of the case. The two respondent groups are thus not made for comparison but for giving different perspectives of the case organization. The MGMT group provides its view on the development and structure of KUL’s link to the hospital, whereas the SPOCs are the links and can therefore give a more practical perspective on how the structure will function.

The respondents therefore consist of a non-probabilistic sample, where elements in the population, the entire laboratory function, have no probability attached to their being chosen as a sample. Instead, information is obtained from specific target groups. The sampling is thus confined to specific individuals who we consider to be in the best position to provide the information required, which is a so-called judgment sample. This kind of sample might limit the generalizability of the findings (Sekaran, 2000). However, the aim with this study is to
create an understanding for the case, not to generalize the findings. Therefore, this sampling method is considered to be the most appropriate, since it offers access to the individuals who most likely can give the information sought.

The MGMT group consists of key participants within the development of the new operating model at KUL. This group is interviewed in order to get a strategic perspective on the new operating model. The MGMT respondents represent different perspectives within top management where each interview was focused on the respondent’s specific area of expertise (see Table 1). However, the data collected from this group is presented and analysed collectively in order to maintain anonymity so that the answers would be as honest as possible.

The SPOC group consists of selected individuals that have been assigned the role as laboratory representatives in the PFMT, and who thereby will handle the practical knowledge sharing between KUL and the PFs. This group is interviewed in order to get the practical perspective of how the contact with the hospital is carried out. The implementation of the hospital’s new operating model is a work in progress, with only two Themes running according to the new operating model at the time of writing. Although all Functions are live to support these two Themes and their PFs, few PFs have begun with their PFMT meetings which means few SPOCs have started operating. We have tried to select SPOCs with the most experience, ranging from one to six meetings, but also included SPOCs that have not yet started operating in order to capture expectations and viewpoints of a larger number of SPOCs.

3.4.2. Semi-structured interviews

The interviews are semi-structured and based on a thematised structure developed from the literature review, as presented below in Table 2. Even though the interviews have a shared structure through the interview guide, the interviews take to a large extent the form of a conversation. The questions are intentionally kept general and open in order for the respondent to bring up what he or she regards as most relevant. When conducting structured interviews, with a clear line of direct questions with associated answers, the interviewer must in advance know exactly what to ask and thus have a clear idea of what to look for (Bryman, 2001). By instead keeping the interviews open, other information then what is actively looked for can be extracted, including unexpected comments, opinions and insights, which clearly is of value for this study. Semi-structured interviews can however create difficulties in the processing of data, since all information obtained might not be relevant for the study and must therefore be selected in an inevitably subjective manner. When conducting a qualitative case study, complete objectivity is never achieved. To achieve neutrality in the processing of data, an interview guide based on theoretical concepts is therefore used (see Appendix 1).

As presented in Table 1, some interviews are conducted over telephone due to difficulties in arranging physical meetings. It is possible that this might have an impact on the answers, but according to literature, such impact is generally moderate (Bryman, 2001) and the number of interviews is in this case prioritized over such potential impact. The interviews are recorded so that they can be reviewed. The data is collected according to the theoretically thematised structure, and answers to interview questions are gathered and presented accordingly. Answers are collected so that they can either be aggregated to general formulations or added as complementing or contrasting remarks.
3.5. DATA ANALYSIS METHOD

The study takes a deductive approach where existing theoretical concepts are applied in an empirical setting. Respondents are asked questions according to an interview guide, presented in Appendix 1. Questions are related to the theoretical concepts of (1) operational strategies of healthcare, (2) knowledge network and (3) knowledge management and sharing, however with an emphasis on the structural prerequisites for the laboratory to share and distribute knowledge. When collecting data on the network and management of knowledge, all questions are discussed in relation to value creation and thus continuously integrating the strategies of value creation.

Since the purpose and research question of this study are developed from the theoretical concepts dealing with operational strategies of healthcare, the first section of the literature review is both considered exclusively in the first section of the interview guide and data analysis, but also in parallel throughout the second and third section. This provides an analysis of the structural prerequisites for the laboratory to share and distribute important knowledge, in order to facilitate and support the value creation around medical conditions.

The empirical findings are presented according to the thematised structure of (1) value-based operating model (2) knowledge network and (3) knowledge management and sharing, all in relation to the facilitation of value creation. See Table 2 for the thesis’ thematised structure, where data generation also describes the design of interview guide.

<table>
<thead>
<tr>
<th>LITERATURE REVIEW</th>
<th>DATA GENERATION</th>
<th>DATA ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational strategies of healthcare</td>
<td>Value-based operating model</td>
<td>Value-based operating model</td>
</tr>
<tr>
<td>Knowledge network</td>
<td>Knowledge network</td>
<td>Knowledge network</td>
</tr>
<tr>
<td>Knowledge management and sharing</td>
<td>Knowledge management and sharing</td>
<td>Knowledge management and sharing</td>
</tr>
</tbody>
</table>

Table 2. The thematised structure of the thesis.

3.5.1. Value-based operating model

In the first section, theoretical concepts regarding operational strategies of healthcare are applied to the empirical setting. The data collected in this section aims at providing an idea of the value-based operating model at KUH and the value creation occurring within the cross-functional structure. This first section thus provides the basis for the analysis of structural prerequisites to share and distribute knowledge and facilitate value creation. The theories connected to this section, being the application of process orientation, VBHC and specialization in a diversified context, are considered throughout the whole analysis.
3.5.2. Knowledge network

The second section considers the knowledge network and the laboratory’s link to it. The data collected in this section is attained by questions developed from the theory of knowledge network, aiming at presenting how the knowledge network will work, and how the link between the laboratory and the network will function.

The analysis of this section will consider the knowledge network in regard of the value creation within specialized units in a diversified context, thus adding theoretical concepts regarding operational strategies of healthcare. Questions relating the knowledge network to value creation considers the laboratory’s role and responsibility regarding value creation within the network, while questions relating the knowledge network to a diversified context considers the prioritization of resources.

3.5.3. Knowledge management and sharing

The third section relates to the laboratory’s ability to share and transfer knowledge and to manage knowledge properly. Here, questions are developed from the theories of knowledge management in the perspective of facilitation of value creation towards medical conditions. This section examines the prerequisites and incentives for the SPOC to handle knowledge that will contribute to the value creation. This means that data collected in this section is analysed both regarding the theory of knowledge management, but also in the context of value creation in a diversified context, integrating knowledge management with operational strategies of healthcare.

3.5.4. Presentation of empirical findings

The MGMT group is interviewed regarding all three areas providing a more strategically oriented data, whilst the SPOC interviews are focused on questions connected to knowledge network and management and thus providing a more practical perspective (see Table 2).

The collected data is presented and analysed in an integrated manner, connecting data to theoretical concepts thematically. This enables efficiency in the text, since the empirical data is already theoretically grounded based on the design of the interview guide. The risk of integrating data and analysis is that the distinction between pure data and the authors’ analysis of the data might not be as clear as if they would be separated. The aim has therefore been to keep the distinction of the two as clear as possible throughout the text, both with the support of quotations from the respondents and by clarifying theoretical concepts along the text.
3.6. RESEARCH ETHICS

Within the public sector in Sweden, all official documentation is available to anyone. Therefore, there are no moral concerns with publishing data or analysing it. Also, since this study considers the patient segments and the interrelated set of medical circumstances that collects them, no individual patient is exposed.

The Swedish Research Council has established four basic principals for research ethics (Forskningsetiska Rådet, 1990) that are respected throughout this study. Firstly, the respondents are informed of the purpose of the study and the aim with their participation. Secondly, the respondents participate by their own free will. Thirdly, the data collected is anonymous and the recordings are deleted after finishing the study. Lastly, the data collected through the interviews is only used for the purpose of this study.
4. FINDINGS AND ANALYSIS

4.1. VALUE-BASED OPERATING MODEL

KUH is, due to problems with fragmented care processes and lack of holistic view, developing an organization based on the patient’s journey through healthcare. Care at KUH is being organized around the special needs of over a hundred nominated PFs, consisting of patients with similar medical conditions and hence a need for similar expertise throughout the healthcare journey. Related PFs are gathered into seven medical Themes that wards, departments and outpatient care units are organized according to. The Themes are supported by five ancillary service Functions, where competences and resources are gathered and available to all Themes (see Figure 1 in 1.4.).

KUH’s new operating model is highly influenced by process orientation and VBHC, aligning and integrating care processes horizontally, however, with ancillary service functions organized outside the process-oriented PFs. The Functions are organized across the specialized PFs, facilitating value-creating activities that, combined with other activities along the patient’s journey, determine the success in meeting the patient’s needs. According to theory, a diversified healthcare provider, composed by several specialized patient units that are related yet diverse, may achieve higher value than a healthcare provider focusing exclusively on one selected target. By gathering many related specialized units, which overall are distinct, an organization can benefit from both specialization and diversification. Therefore, by acknowledging the benefits of specialization within each PF, while still responding to a large number and a wide spread of medical conditions, KUH is subject to benefits from both specialization and diversification.

One of the supporting ancillary service functions in KUH’s new operating model, and the case of this study, is the laboratory function KUL. KUL consists of eight laboratory Function Areas, three administrative departments and a 24Seven department where common and highly automatized analyses are run 24 hours a day (see KUL’s organogram in Figure 2).

![Figure 2. The organogram of the Karolinska University Laboratory. Picture inspired by KUL working material (KUL, 2016).](image-url)
Theory suggest that an organization with a broad range of related activities can benefit from sharing common resources and capabilities across operating units. Organizing activities across specialized units allows economies of scope and a deepened know-how of generic attributes to develop, where quality improvements in one specialized unit can spill over to other specialized units when managed as a shared input. Sharing resources across the organization may also improve an efficient use of resources, by maintaining functional disciplines technically innovative while allowing projects to benefit from the use of functional economies of scale. It would therefore be irrational to completely integrate KUL in each flow. One MGMT respondent describes that:

“We have chosen not to divide the laboratory operations into patient flows. I think we rather need to be both within the flows and vertically. Some types of analyses are needed by everyone. Having the analyses organized horizontally would split our business too much. Then we would lose economies of scale and it would drive costs enormously, and I also think that the quality would be too varied.”

By organizing ancillary service functions outside of process-oriented PFs, where KUL together with other Functions crosses horizontal Themes vertically, a matrix organization is created. The intention with a matrix organization is to increase the ability to handle more information, while letting the organization focus on specific processes and thus reduce the need for information processing. At KUH, focus in the new cross-functional operating model is placed on the care processes of PFs where interactions between functional and process responsibilities are enabled by the PFMT.
4.2. KNOWLEDGE NETWORK

4.2.1. Value creation in the network

The network perspective on organizational learning stresses the importance of contact and knowledge exchange between organizational units. At the PFMT meetings, representatives from all units involved in the full care cycle share and integrate knowledge while discussing the long-term development of a specific PF (see example in Figure 3). This is thus in line with the network perspective, since the units become parts of a knowledge network where all representatives can contribute to the long-term development of the PF.

Figure 3. An example of a Patient Flow Management Team meeting. Picture inspired by KUL working material (KUL, 2016).

Respondents express that the value of laboratory services is generally underappreciated out in the hospital. During the interviews, close to all respondents express a need for further interaction with the rest of the hospital. Further integration could optimize diagnostics since there is a widespread ignorance throughout the hospital of how the laboratory service can contribute. The new operating model with PFMTs is providing a new and more structured way for knowledge to be shared within the hospital. Before, communication between the laboratory and other entities was mainly upheld by unofficial contact points, developed over time by individuals. Through these contact points, KUL was invited to take part in only specific parts of the patient’s healthcare journey, in questions regarding quality, lead times or interpretation of a specific analysis. Through the constant presence in the PFMT, KUL now has the opportunity to get a holistic view of the PF needs and provide input regarding the entire care cycle, not only isolated parts of it. The respondents highly believe that a holistic view over the care cycle will enable KUL to give more efficient recommendations regarding the use of laboratory services. Many respondents describe a tradition of the laboratory being separated from the rest of the hospital and not being an integrated part of it, and that this new more compulsory contact channel provides a needed opportunity to increased presence of laboratory expertise throughout the care process.

The respondents state that the PFMT provides an official forum where KUL can have a direct impact on the PF by answering questions regarding lead times, quality, availability and interpretation of current analyses. They also state that the presence in the PFMT provides opportunities to improve the quality of the samples that KUL
receive from the PFs, by clarifying instructions regarding how a sample is taken or transported. For example, a blood analysis might not be possible to run if the sample is too old or if the blood cells are damaged. If KUL receives a sample of bad quality, the sample must be retaken, which creates delays. By ensuring the quality of input received from the PFs, KUL can better ensure the quality of output provided to the hospital. By being present in the PFMT, KUL will also be able to make sure that expectations on the laboratory services are accurate, so that the PF can adapt their work accordingly.

Moreover, respondents describe that being part of the PFMT, KUL is now invited to a discussion regarding the long-term development of PFs. KUL can now be more proactive in its consultation to the PF regarding what analyses to order. For example, a PF might order unnecessarily many, or an irrational combination of, analyses. Maybe more analyses should be ordered at the same time, even though they might be expensive, if the cost still is lower than the cost of the daycare of the waiting patient. KUL can through statistics announce ordering patterns and customer behavior, and thus question the present behavior to ensure the optimal way of meeting the patient needs. With this new model, KUL goes from being a passive supplier to an active advisor and partner.

VBHC is about organizing and integrating care around a particular medical condition, where integrated expertise can help maximizing the patient's value over the entire care cycle. KUL creates value, both directly, by providing technical knowledge regarding how tests are taken and analysed, but also indirectly, by guiding the PF in how to use laboratory services in an optimal way. By capturing needs and optimizing the ordering package for each specific PF, and thus more proactively convey what KUL can offer, the PF will be able to better utilize the diagnostics which in turn leads to a greater patient value.

4.2.2. The laboratory’s network position

The concept of network position refers to a unit’s location within the inter-unit knowledge network and describes the unit’s level of access to knowledge. In order to both get access to the knowledge developed within the PFMT and share laboratory specific knowledge regarding the PF, KUL has designated a laboratory representative to be part of the PFMT, the SPOC, which is intended to work as the laboratory’s link to the network (see Figure 3).

4.2.2.1. The structure of the link

The laboratory employee with the most relevant expertise for a specific PF is selected SPOC for that PF, in order to as efficiently as possible respond to the laboratory issues raised in the PFMT. In many cases, the expertise required for several PFs is very similar. In these cases, the same individual is SPOC for several PFs. The MGMT respondents express that the role has deliberately been kept fairly open, since they expect that the role will be very different across the PFs. This way, the SPOCs can have an impact on how to create the most appropriate SPOC role for their specific PF. Moreover, it is stated that there are no formal requirements regarding the SPOC’s profession, however, at this moment all appointed SPOCs are specialized physicians.
Respondents argue that there are two main aspects of the SPOC role. On the one hand, the SPOC is part of the PFMT to meet laboratory related issues brought up by the other representatives at meetings. On the other hand, the PFMT is also a forum for KUL to work proactively with the laboratory’s contribution to the value creation.

4.2.2.2. The quality of the link

The respondents recount that even though the SPOC represents the whole laboratory function, it is in most cases impossible for one individual to possess all laboratory specific knowledge needed by a PF. This creates a need for the SPOC to meet with other individuals with other relevant expertise. Therefore, competence clusters are set up for every PF to whom the SPOC can turn. A competence cluster is a network of individuals within KUL from other Function Areas than the SPOC’s, that are relevant for ensuring the PF needs (see example in Figure 4). This is how the quality of the link is intended to be ensured.

The competence clusters are most relevant when the SPOC needs information and knowledge that he or she does not personally possess. However, the respondents agree that there are two additional needs in the management of knowledge that are not yet handled in the new structure. Firstly, if the issue is more general or relevant on a more strategic level, such as the availability or lead times, it must be escalated in the laboratory organization. Secondly, it is likely that similar questions will be raised across different PFMTs and it is thus important to aggregate answers and spread them between SPOCs, in order to provide awareness of the issue and a standardized answer throughout the hospital.

Figure 4. The SPOC and its competence cluster. Picture inspired by KUL working material (KUL, 2016).
4.2.3. The laboratory’s absorptive capacity

However, the concept of network position, i.e. the possibility to access knowledge from other organizational units, is but one of the two aspects of the knowledge network perspective. KUL’s network position has clearly been improved by the creation of the SPOC as a KUL representative in the PFMT. However, the laboratory also needs to consider its absorptive capacity, i.e. the ability to use and act on the information obtained.

The MGMT respondents stress that it is important to keep in mind that the SPOC has no responsibility to independently resolve the issues brought up in the PFMT and has for example no mandate when it comes to resource allocation. The SPOC is in this sense only a KUL representative, or a messenger, and brings laboratory specific knowledge and competences into the PF, as well as needs, requirements and questions from the PF to KUL. Therefore, the need for an internal structure for the absorptive capacity is crucial, where knowledge escalation and aggregation are the main needs.

4.2.3.1. Internal processes

Even if the need for an internal structure for knowledge escalation is highly agreed upon among the respondents, it is not yet formally decided what exact forum should be used. The MGMT respondents state that there has been a discussion about introducing a *SPOC coordinator* in charge of the infrastructure surrounding the SPOC, such as IT requirements or other administrative or supportive functions. The coordinator would also oversee how the SPOC role is developing, ensuring that relevant knowledge is provided to the PFMT. The coordinator would also assess what kind of issues is raised at the meetings, in order to identify overall patterns or issues that should be coordinated. One of the MGMT respondents also argue that the SPOC coordinator could play a role in the escalation of issues and have the responsibility to convene meetings among the SPOCs in order to coordinate issues directly between the SPOCs. For more PF specific questions, some respondents, however, argue that the SPOC needs to turn directly to the organizational area where he or she assesses that the issue is most appropriately handled. This might be in a specific Function Area, or in other departments such as Customer Relations or IT. In order to meet PFs’ needs as efficiently as possible, there is therefore a need to integrate internally. One MGMT respondents state that:

> “The new operating model is a way of approaching the patient and the value-based healthcare, considering that we earlier often were forgotten and did not participate at this type of meetings. […] We are integrating ourselves with the hospital, but at the same time we have to integrate ourselves internally as well, otherwise it will not work.”

Another MGMT respondent state that:

> “If one [PF] wants to set up one analysis that other [PFs] can benefit from, the information about it must be spread.”

The benefits received from internal integration at KUL therefore corresponds to the internal knowledge spillovers of related diversification, which is facilitated by the sharing of resources across related yet diverse focused operating units. Knowledge produced by one specialized unit may thus contribute to quality improvements also in other units, when managed as a shared input serving a variety of segments.
4.2.3.2. **Resource prioritization and optimization**

According to Kumar et al. (1993), the greatest benefits of integrating a complex healthcare organization are attained only when the whole organization puts the efficiency of medical conditions above internal resource utilization. This suggests that an ancillary service must consider their final output to be the value delivered to the patient, rather than an intermediate production, e.g. a laboratory delivering a laboratory analysis. The respondents, however, argue that one does not rule the other out, but rather that a maximized value creation requires an optimized internal resource usage. One of the respondents in the MGMT said that:

“There is a new operating model implies a clarification of the customer’s needs, which should facilitate things for all parts. Much more exact production planning can be achieved through this direct information. It might take ten years to reach this, but in the end, we might land in a much more accurate production planning.”

Respondents describe that in the old operating model, much of the production planning has been ad-hoc estimations of customer needs. The close and regular feedback from the PFMT will instead enable KUL to make more accurate estimations so that a more efficient production can be developed. The respondents state that internal improvements in resource optimization will thus directly improve the service delivered to the PFs, but it will also result in savings within KUL, so that processes and products can be developed further.

This discussion is in line with Porter and Teisberg’s (2006) definition of value as health outcome relative to its cost. An efficient resource use means a higher total value, and KUL therefore has a responsibility towards the hospital to operate as efficiently as possible. For example, one MGMT respondent points out that:

“If every [PF] has their own requests regarding lead times, it’s impossible for us to adapt. Then we’d just sit and sort tests all day.”

Similarly, another MGMT respondent states that:

“If we, for example, receive different requirements on lead times, we must always escalate that dialogue so that we don’t promise one thing to one [PF], and another thing to someone else. We can’t start to diversify like that, to meet everybody’s needs, we must see this from a ‘[KUH] perspective’.”

In addition to adapting to the new model, KUL has developed a site where common and highly automatized analyses are run 24 hours a day (see Figure 2). In the 24Seven department, analyses are gathered in order to achieve economies of scale instead of inefficiently setting up individual hotlines for every Function Area. With knowledge about all PFs’ requirements, a well-founded prioritization of 24Seven analyses can be made, and thus an efficient use of resources.

There are in other words several potential channels within KUL to aggregate and escalate questions raised by the PFs, through which the absorptive capacity can be increased, e.g. a SPOC coordinator, competence clusters, and the 24Seven department. However, it is still unclear exactly how aggregation and escalation of questions will be structured. The absorptive capacity is thus not as clearly articulated as the network position, when considering the theoretical concept of the knowledge network.
4.3. KNOWLEDGE MANAGEMENT AND SHARING

In order to be a successful part of a knowledge network, theory states that careful consideration of how knowledge is managed and shared is required. Knowledge sharing is partly dependent on employees’ motivation to share knowledge and partly on the organization’s ability to transfer knowledge.

4.3.1. Motivation to share knowledge

Theory identifies leadership and rewards systems as two main aspects when it comes to the motivation to share knowledge. Leadership can be analysed on various levels throughout the laboratory organization, both the line managers closest to the SPOCs and the top management of KUL.

When asked about the role of leadership, the appointed SPOCs do not consider the support of their closest line managers as a pressing issue in the motivation to share knowledge. However, a need for a more active leadership from the top managers within KUL is found among the SPOCs. This is shown in an irritation among many of the SPOCs over the lack of information regarding what the SPOC role is and what is expected from them.

Nevertheless, some of the interviewed SPOCs have a clear perception of the SPOC role in line with MGMT’s idea. These respondents express an understanding regarding the role not yet being clearly defined. With only two Themes running according to the new structure, most PFMT have not initiated the meetings yet, and the whole structure throughout the hospital is still new. Therefore no one, not KUL nor the PFs, can so far know exactly how the PFMT should function. The SPOCs expressing this understanding have some experience from actively taking part in PFMT meetings, or have been part of the project group designing the SPOC role. However, others SPOCs have a very vague idea about what the SPOC role actually mean other than being some form of KUL representative in the PFMT, and know close to nothing about how the role is supposed to function.

All of the responding SPOCs agree that the motivation to be SPOC is the opportunity to have an impact on the care delivered in the PF by providing laboratory specific expertise, to increase the awareness of the importance of laboratory services in the care process, and thus improve the total value provided. Both groups state that being the laboratory representative should not be seen as a separated task alongside the regular clinical work, but as a part of the mission as a physician. It is already their job to monitor needs and spread laboratory specific expertise and thus to improve healthcare.

Although theory states that rewards and leadership are important for motivating sharing of knowledge, at KUL, there are no new rewards connected to the new structure and there does not seem to be a need for it either. Leadership, however, does seem crucial as a source of information and decision-making regarding the new SPOC structure. The only circumstance under which some of the SPOCs reluctantly express a possible need for some form of compensation is if it permanently will take up too much time, and prioritizing time becomes a problem, confirming theory that time constraints are an issue. There is among the SPOCs a particular fear that the requirements for documentation will be too extensive.

Since the SPOC respondents already deal with SPOC related tasks in their daily work, and thus also have found time for it, the SPOC role should in theory give them better prerequisites of doing this so that it can be done
more efficiently. Therefore, as some of the MGMT respondents state, the introduction of the SPOC role can be seen as a time-saving investment in the long run, even if it might be more time consuming in the beginning before routines and structures have been set.

4.3.2. Ability to transfer knowledge

According to theory, knowledge sharing depends both on the motivation to share, but also on the means by which it is physically possible to transfer knowledge. When it comes to networking, the PFMT is one such possibility to physically meet with other parts throughout the hospital that one would not otherwise meet. However, when it comes to the internal absorptive capacity, respondent from both groups express the need for individuals involved in KUL’s network position to physically meet, such as the SPOC meeting its competence cluster, and SPOCs meeting each other.

When it comes to information technology there is a general consensus among the respondents. There is on the one hand a need to handle the information gathered in the PFMT in a unison and structured way, both in order to share it with other parts within KUL, such as the competence clusters or other SPOCs. On the other hand there is also a need to document the SPOC’s work in order to make it less dependent on the individual and thus have the possibility to survive even if the SPOC, or someone in the competence cluster, is replaced. However, there is a strong awareness of the limited funds available for such IT solutions and there are very low expectations on what new IT solutions can facilitate, mainly based on previous experiences of how needs for IT have been met. There is also a clear resistance to the introduction of new IT systems, where one SPOC expresses:

“We are drowning in different systems, and none of them ever work properly.”

4.3.3. Existing channels for knowledge transfer

The new operating model is a possibility for KUL to approach the patient and the VBHC, and influence the value created. All respondents consider this difference from the old operating model, where the laboratory often was forgotten, as a positive change. However, some Function Areas or specific units already have functioning channels of knowledge transfer set up which might make yet another channel unnecessary. One of the SPOC respondents express a fear that inter-personal connections or other collaborations that today work well will be endangered only because top management has decided that communication must go through the SPOC. The SPOC argues that a new structure would only damage the organization, or at least damage the SPOC’s specific specialty. Or, it might create double communication channels, one official and one unofficial, if the old channel would continue to be used in parallel to the SPOC and the PFMT. A Function Area Manager also express that their Function Area already have a working official contact network with the hospital, similar to the PFMT.

Although these two respondents see threats for their specific specialty or Function Area, the majority of respondents state that coherent hospital wide communication channels are lacking. They thus express a need and desire to drastically increase knowledge sharing, which makes the SPOC a welcome initiative.
5. DISCUSSIONS

5.1. VALUE-BASED OPERATING MODEL

KUH is developing an organization based on the patient’s journey through healthcare. However, while KUH is organizing care around medical conditions in line with VBHC, the ancillary service functions at Karolinska are still organized across the specialized PFs. Therefore, KUH’s new operating model is only partly adopting the VBHC concept, with everything except the ancillary services fully integrated. It is simply more efficient to structure the organization as a matrix, where sharing resources across the hospital can improve an efficient use of resources. Allowing ancillary services to stay technically innovative enables functional economies of scale, economies of scope and a deepened know-how of generic attributes. Knowledge produced by one specialized unit may thus contribute to quality improvements also in other units, if a shared input is improved. An additional possible value creation that is facilitated within this structure is therefore when the benefits of specializing into one segment helps improve the quality of a related segment.

According to this discussion, both the laboratory, hospital and in the end patients should benefit from organizing ancillary service functions outside of the specialized PFs. With fully integrated practice units, as suggested by VBHC, potential spillover effects between PFs would be hard to achieve. Therefore, it might be argued that a diversified model of VBHC, with everything except the ancillary services fully integrated, might achieve even higher possibilities to maximize value for a specific medical condition, than what Porter and Teisberg originally propose. Within such model, the spillovers are facilitated by the ancillary service functions of the hospital, which therefore has a crucially important role when it comes to the combined value creation in the hospital.

5.2. KNOWLEDGE NETWORK

5.2.1. Value-creating network

In the new value-based operating model, all expertise that jointly determine success in meeting a set of patient needs are integrated to a PFMT. This way, integration within each patient flow is facilitated while the organization is still benefiting from functional efficiency and potential knowledge spillovers. The PFMT enables KUL to easier capture needs of PFs and optimize ordering packages, in order to maximize the patient value. Within the diversified model of VBHC, the ancillary service function therefore goes from being a passive supplier to an active advisor and partner.
5.2.2. Network position

With spillovers facilitated by the ancillary service functions, the laboratory representative, the SPOC, is both responsible for knowledge sharing back and forth the PF but also for facilitating spillovers between different PFs. The SPOC structure is thus a key component in the coordination and integration structure between the laboratory and the hospital, but also a way of organizing spillovers between PFs.

5.2.3. Absorptive capacity

The close and regular feedback from the PFs will enable KUL to make more accurate estimations so that a more efficient production can be developed. Internal improvements in resource optimization will thus directly improve the service delivered to the PFs, but it will also result in savings that can be used to further develop processes. Kumar et al.’s statement regarding the greatest benefits of integrating a complex healthcare organization being achieved only when the whole organization prioritizes the value delivered to the patient over optimizing its own resources, is thus being questioned by this study. It is argued that resource optimization does not eliminate a prioritized patient value, but rather that a maximized value creation requires an optimized internal resource usage. With Porter and Teisberg’s definition of value as health outcome relative to its cost, the definition of value in the diversified model of VBHC might therefore be defined as accumulated health outcome relative to total cost.

An efficient resource use means a higher total value, and KUL has therefore a responsibility towards the hospital to operate as efficiently as possible. In order to do so, internal integration seems to be key. Through internal integration within KUL, enabling escalation and aggregation of PF related issues, spillover effects can be achieved between the PFs that would be hard for the integrated care processes to achieve by themselves.

However, the structure of the internal processes covering the absorptive capacity of KUL is evidently not very thoroughly developed. By being part of the PFMT, KUL has the possibility to contribute to the value creation in a more efficient way than previously. However, to succeed, KUL depends on the development of the SPOC role and that KUL as an organization can manage the knowledge provided. The reason to separate the knowledge network in two parts is to highlight both of their importance to a successful participation in the network. KUL has developed a clear network position through the SPOC role, but the structure surrounding it must be furthered developed with the absorptive capacity in mind. This requires a careful consideration of the structures for knowledge management and sharing.
5.3. KNOWLEDGE MANAGEMENT AND SHARING

SPOCs not seeing the support of their closest line managers as a pressing issue in the motivation to share knowledge, can partly be due to the fact that many SPOCs have not yet started the work as SPOC and have therefore no experience of what role the line manager will play in the new structure. It can also depend on the strong integrity of the individual SPOCs, who are highly merited people and experts in their areas. Therefore, they are used to depend on their own capabilities and take on roles independently, which might lessen their need for a supportive superior close by.

However, there is a need for a more active leadership from the top management within KUL. A clear connection exists between negative attitudes and lack of information regarding the role of the SPOC. The more informed SPOCs, however, have ideas of how the role can be further developed and improved as well as what is needed in order to function properly – initiatives that are crucial for the implementation of the SPOC, especially since the role is so vaguely defined by management.

Although MGMT express that they deliberately want to keep the role as open as possible in order to learn as it goes, and to let the SPOCs themselves be part of the development, this approach has definitely not reached all affected parties. However, the negative attitude is not so much due to finding the idea or vision of the SPOC bad, but due to lack of information about how it is intended to function, as well as a feeling of being excluded from information and decision making. As experts in their fields, the appointed SPOCs thus seem to have little tolerance for being kept in the dark.

When it comes to knowledge transfer, there is an awareness of the need for appropriate IT systems, but there is also a resistance to the introduction of new ones. Therefore, a knowledge audit could be appropriate, where the unmet needs of IT solutions are analysed. This way, the laboratory can identify whether these needs can be met through relocation of existing resources, or if they must be retrieved externally.
6. CONCLUSION

This chapter will provide the answer to the research question:

*How can an ancillary service function, in a diversified context, facilitate and support the value creation around medical conditions?*

6.1. Facilitating value creation around medical conditions

In this case study, the value-creating network provides opportunities for the ancillary service function to go from being a passive supplier to an active advisor and partner in the value creation. By proactively consider the entire care cycle, an ancillary service function can optimize ordering packages for each specific medical condition, allowing resources to be better utilized which in turn leads to a greater patient value.

This close and regular feedback from the knowledge network regarding patient needs is not only valuable for the patient, it also enables an ancillary service function to plan production more efficiently. With clear knowledge about all requirements amongst the medical conditions, a well-founded prioritization of analyses can be made, and thus an efficient use of resources. Resource optimization that leads to internal improvements may both directly improve the service delivered to the patients, but also result in savings within the ancillary service function. This would enable processes and products to be further developed, thus creating a virtuous circle.

By attaining an efficient resource use, a higher total value can be achieved. This contradicts previous research regarding an ancillary service having to consider their final output as the value delivered to the patient, rather than an intermediate production. According to this case study, the efficiency of patient flows and resource utilization go hand in hand where a maximized value creation requires an optimized resource usage. This learning further develops the VBHC definition of value as health outcome relative to its cost. When considering value in a diversified context, value might be defined as *accumulated* health outcome relative to *total* cost.

6.2. Specialization in a diversified context

Specialization can create optimal conditions for a specific patient segment, which allows a higher value of the patient’s overall outcomes. However, specializing in several areas can lead to economies of scale, scope and other spillover effects, by allowing resources and capabilities to be shared across several specialized units.

This case study shows that a diversified model of VBHC can facilitate needed integration through a knowledge network, where representatives meet to share and integrate knowledge to ensure holistic value creation throughout the patient’s healthcare journey. A diversified model of VBHC, with everything except the ancillary services fully integrated, can support integration *within* each medical condition while facilitating knowledge spillovers *between* medical conditions, that would not be attained with fully integrated practice units.

The benefits achieved from diversification are thus facilitated by the ancillary service functions of the hospital, which therefore holds a crucial role when it comes to the combined value creation in the hospital.
6.3. Enabling structures in the ancillary service function

In order to achieve maximized value creation within each medical condition, it becomes crucial for the ancillary service function organized outside of focused operating units, to develop a comprehensive structure for external knowledge sharing towards the medical conditions. However, in order to operate as efficiently as possible, internal knowledge sharing that allows aggregation and escalation within the ancillary service function seems to be key. Through this internal integration, potential spillover effects that otherwise would be difficult for the integrated care processes to achieve, can be facilitated by the ancillary service functions.

In this case study, the ancillary service function has developed a structure for how to be active in the long-term development of each patient flow. However, a structure to assimilate the knowledge obtained is still lacking. The internal integration within the ancillary service function is in this case dependent on the continued development of both the representative link to the knowledge network and the ancillary service function’s own ability to manage the knowledge provided. An active top management that provides the representative with the support needed, seems in this case study to be the key. In the short run, clear communication from top management to all representatives and further involvement of the representatives in the development of the role is needed. In the long run, the development of an efficient supportive structure for the representatives is required, e.g. through a representative coordinator. This is likely to require a lot of work, but should be considered a time-saving investment in the long run.

6.4. Contribution and implications for further research

It is concluded that an ancillary service function can, in a diversified context, facilitate and support the value creation around medical conditions by developing a comprehensive structure for knowledge management and sharing, both externally towards medical conditions and internally within the ancillary service function. By creating a structure that facilitates external integration and ensuring access to the knowledge network, value creation is supported *within* each medical condition. By creating a structure that facilitates internal integration within the ancillary service function and ensuring the function’s own ability to manage the knowledge provided, value creation is facilitated *across* all medical conditions by allowing functional economies of scale, scope and knowledge spillovers.

We therefore still argue, as in the problematization initiating this study, that a complementary strategy is needed regarding how to organize and coordinate activities that contribute to the success in meeting a set of patient needs, while still benefiting from being shared across the organization. Ancillary service functions organized outside of specialized units thus need to be further examined when it comes to implementing process orientation and specialization in a diversified hospital. This need is based both on the lack of previous research regarding organizing ancillary services when specialization is applied in a diversified context, but also due to the strong potential benefits of a diversified model of VBHC as presented in this thesis.

This case study represents a snapshot of the current implementation of a value-based operating model, in a stage too early to observe the outcomes. Further research of this particular case should therefore be conducted in order to determine its success and potential contribution to a complementary strategy.
7. LIMITATIONS OF RESEARCH

7.1. Reliability of the study

When conducting qualitative studies, complete reliability is close to impossible to achieve. Nevertheless, based on our selection of case, respondents and theoretical framework, we argue that our data and results are reasonable. Also, by sending the complete thesis to the case organization for approval, the empirical findings that form the conclusions are ensured. It is also important to remember that the implementation of the new operating model is a work in progress, so the case study has not only created an understanding of a specific setting, but of that setting in a specific time. The development continues, and studies in the future will thus reflect another situation even if the same case is investigated.

7.2. Validity of the study

Respondents in both groups were selected through a judgment sample, although SPOCs were selected from a much larger group of potential candidates, which might decrease the validity of the results. All Function Areas were, for instance, not represented in the sample. Respondent’s from Function Areas that already had structures set up to coordinate activities with the hospital had in general a more negative attitude towards the new operating model. Not including all Function Areas could therefore create an unfair result.

Also, the SPOC sample might have been too small to truthfully reflect the attitudes towards the new operating model. It was also shown that SPOCs with more experience and knowledge regarding the SPOC role had a more positive attitude towards it. Around half of the SPOC sample has participated in a PFMT meeting or had been part of the project group developing the SPOC role, and thus possessed more knowledge about the role. The experienced SPOCs were deliberately selected since they could give more information about the SPOC, which is appropriate since the aim was to understand the link between the laboratory and the hospital. However, the data collected does probably not reflect the general idea among the SPOCs throughout the organization, since the quota between experienced and inexperienced SPOCs in the sample does not reflect the quota in the organization. Rather, the inexperienced SPOCs are in clear majority in KUL.

These aspects could create a sample bias and therefore affect the validity of the data. The results of this study should therefore be handled critically. However, the aim with this study is to create an understanding of a case and we still believe that the judgment sample, and the criteria with which respondents were selected, are valid for this purpose. The results are therefore a valuable empirical contribution to the existing research regarding integration of ancillary services in a diversified hospital setting.
8. REFERENCES


KUL. (2016). New Operating Model Karolinska University Laboratory.[Working Material], Stockholm: Karolinska University Laboratory.


9. APPENDICES

9.1. APPENDIX 1 – THE INTERVIEW GUIDE

1. VALUE-BASED OPERATING MODEL
Theoretical background: process orientation, VBHC, specialization, diversification, matrix organization

- Could you tell us about the design of KUH’s new operating model?
- What are the implication for KUL, regarding the new operating model
- Could you tell us about the structure of the PFMT and the intended cross-functional interactions?

2. KNOWLEDGE NETWORK
Theoretical background: VBHC, specialization, diversification, knowledge network, network position, absorptive capacity, resource optimization

STRUCTURE AND QUALITY OF THE LINK
- The PFMT can be regarded a forum, or network, where knowledge from different parts of the hospital are gathered: could you tell us about how KUL is represented in this forum?
- What is KUL’s responsibility when it comes to value creation towards PFs?
- What is the role of the SPOC? How does the SPOC role function?
- How is the quality of the link (SPOC) ensured?
- What is the purpose of the competence clusters (CC)? How do they work?

ABSORPTIVE CAPACITY (AND RESOURCES OPTIMIZATION)
- What ability does KUL have to act on the knowledge retrieved from the PFs?
- With new knowledge about PF, is KUL able to make changes in internal prioritizations in order to meet the different PF needs? Resources are not infinite: How will resources be prioritized between PFs?
- What will be the main differences when it comes to absorbing needs and prioritizing resources with the new operating model and PFMT?
- Is KUL prioritizing an increased value for KUH’s PFs, or an optimization of KUL’s own capacity and resource use? Is there a risk of conflict of objectives?

3. KNOWLEDGE MANAGEMENT & SHARING
Theoretical background: VBHC, specialization, diversification, knowledge management, knowledge sharing

MOTIVATION TO SHARE KNOWLEDGE
- What incentives are there for the SPOC to be an active link between KUL and the PFs?
- What requirements or demands from KUL and from the PFs exists regarding the SPOC’s activity?
- What role does leadership have in the SPOC’s motivation to be an active link to the PFs?
- In what other ways can the organization affect the SPOC’s motivation to be an active link to the PFs?

ABILITY TO TRANSFER KNOWLEDGE
- What prerequisites does the SPOC have to obtain laboratory specific knowledge in order to meet the needs of the PF (time, IT, routines, administrative support etc)?
- What prerequisites does the SPOC have to spread PF specific knowledge throughout KUL (time, IT, routines, administrative support etc)?
- How can the organization support the SPOC in the process of gathering and disseminating knowledge?