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HOW CAN HEALTH CARE ORGANIZATIONS CREATE VALUE? BUSINESS MODEL EXPLORATIONS

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HOW CAN HEALTH CARE ORGANIZATIONS CREATE VALUE?
Business model explorations

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Mother *Father*

This thesis is dedicated to my four cornerstones

Sister *Linnea*

ABSTRACT

Background: The Triple Aim posits that health care should strive to improve patient experience, improve population health, and maintain or lower costs. However, most organizations are not organized to achieve the Triple Aim. Attempts to improve the ability of health care organizations to deliver increased value through the introduction of management concepts, most recently Value-based Health Care (VBHC), have led to the emergence of a pattern of pseudoinnovation, where concepts are frequently replaced with similar content, but in new "packaging". This suggests that organizations and their ability to adapt to their environment and integrate new management concepts could potentially be explored by looking at how the concepts themselves are understood and at how organizations deliver care. In management terms, the latter can be described as the business model (i.e., how an organization creates, delivers, and captures value).

Aim: The overall aim of this thesis is to understand how management concepts about value are understood and to explore how health care organizations in a publicly financed health care system are organized so that they create, deliver, and capture value.

Methodology: In Study I, citation registry data and literature were sequentially analyzed qualitatively and quantitatively to assess diffusion and understanding of VBHC as a nascent management concept in the literature. Study II, a systematic review, employed an explanatory synthesis approach to understand how business model frameworks have been applied in health care. Studies III and IV apply the Business Model Canvas (BMC) framework in a deductive content analysis of interviews with top managers (Study III) and with multiple data sources (Study IV) to conceptualize a hospital business model and to compare perinatal clinics' business models in a publicly financed, Swedish health care setting.

Findings: VBHC and business model frameworks are commonly and increasingly used to improve value in health care. VBHC is superficially understood in the literature (Study I). Business model frameworks are primarily applied in e-health. They include a broad range of elements and have been used to identify essential elements, assess finances, and classify, analyze, develop, and evaluate organizations (Study II). Managers conceptualized the hospital business model differently, primarily related to customer segments. A tension between espoused and *de facto* value propositions was identified (Study III). Four distinct perinatal business models were identified within the same regional health system (New Thinkers, a Local Service Provider, Continuous Capacity Keepers, and a Hybrid) (Study IV).

Conclusions: The superficial understanding of VBHC and the ambiguity and lack of empirical data in business model applications risk diluting the potential benefits of both these management approaches. The multiple, co-existing business models within the same organization or health care system raise questions about how organizations are aligned and how we should view the role of different stakeholders in creating, delivering, and capturing value.

LIST OF SCIENTIFIC PAPERS

I. Fredriksson, J. J., Ebbevi, D., & Savage, C. (2015). Pseudo-understanding: an analysis of the dilution of value in healthcare. BMJ Qual Saf, 24(7), 451-457

II. Fredriksson, J. J., Mazzocato, P., Muhammed, R., & Savage, C. (2017a). Business model framework applications in health care: A systematic review. Health Services Management Research, 30(4), 219-226.

III. Fredriksson, J. J., Ebbevi, D., Mazzocato, P., & Savage, C. Exploring a hospital's business model – A qualitative interview study of top managers' perspectives. Manuscript.

IV. Fredriksson, J. J., Savage, C., Martin-Löf, A., Martin, E., Amer-Wåhlin, I., & Mazzocato, P. Business models in perinatal care. Manuscript.

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LIST OF ABBREVIATIONS

BMC	Business Model Canvas
BMO	Business Model Ontology
CAFO	Context-Approach-Framework-Outcome
CCK	Continuous Capacity Keeper
CIMO	Context-Intervention-Mechanism-Outcome
LSP	Local Service Provider
NT	New Thinker
SOLO	Structured Observed Learning Outcomes
QI	Quality Improvement
VBHC	Value-based Health Care

1 PROLOGUE

The story of how and why I became a doctoral student at the Medical Management Centre (MMC) is multi-factorial and serendipitous. Early in my medical school studies I learnt to channel my frustration that arose from experienced inefficiencies by developing an interest in improving the curriculum for my fellow students. Eventually this interest became a naïve ambition as a junior doctor to learn how to redesign a health care system characterized by waste. Making useful improvements in the health care system requires practical and theoretical medical and health care management knowledge. I think all these areas have mutually reinforcing influences that can lead to a better understanding of certain problems in health care.

My practical experience as a student and clinician that, among other things, involved reflective work in the hospital corridors, was valuable. I also had held various leadership positions in which I helped improve the education quality and the clinical environment. I had also worked as a management consultant in health care (for a brief period one summer). Furthermore, I had on a scholarship acquired theoretical knowledge and skills in health care management in the United States. Given these experiences, the next "logical" step was to a doctoral program at the MMC.

My journey in the PhD program at MMC has been challenging. I have learnt that health care organizational and systems research is very complex, and that context has a significant role as far as what works and what does not. I have also realized that my medical school and prior preclinical research training influenced my research by giving me a quantitative world view. At first, this view clashed with the qualitative research view I was introduced to as a doctoral student.

My world view of values and my concept of knowledge, which affect how I interpret reality, has evolved significantly during my doctoral studies, especially with respect to my community of research peers. This community has influenced my choices of research approaches, procedures, tools, and data collection methods. As a result, I have reached different interpretations at different stages of my research.

I remain convinced only one reality, based on physical laws, exists. However, at the same time, I have realized that knowledge can be acquired from different realities, which are dynamic and exist in the eye of the beholder. Patients, interviewees, or friends will probably never have the same mental model of what was discussed during a consultation, interview, or chat. I, however, think that clear and concise communication (sometimes in terms of business models) could bridge the interpretation gaps so as to reach close to a shared understanding of things. On the other hand, the English playwright, George Bernard Shaw, described the difficulty of achieving a shared reality with communication: "The single biggest problem in communication is the illusion that it has taken place".

Jens Jacob Fredriksson

2 BACKGROUND

Today's health care systems face many challenges in what seems to be an ever-changing environment. According to the Triple Aim, higher quality of care and improved patient experience at a lower cost are required to optimize health care system performance (Berwick et al., 2008). However, most organizations are not configured to realize the Triple Aim (Berwick et al., 2008); money is often wasted, care coordination is poor, processes are not followed or suffer from unmotivated variation, and the administrative burden is increasing (Berwick and Hackbarth, 2012).

Health care systems have been defined as complex adaptive systems (Plsek and Wilson, 2001, Greenhalgh and Papoutsi, 2018). The complexity lies in the technical, societal, institutional, and political environments and creates difficulties for change initiatives intended to make improvements (Glouberman and Zimmerman, 2002). The challenge can be greater for public organizations that are often seen as more complex and resistant to change, although the differences between private and public organizations may be overemphasized (Pettigrew, 2012).

From a managerial perspective, it is difficult to navigate complexity (Rouse, 2008). While finding ways to simplify complexity may seem attractive (see Section 2.1), it is difficult to achieve the right balance. Too much simplification may not solve the actual problems and in fact may create new ones (Edwards and Saltman, 2017). Instead, managers must continually renew "an organization's direction, structure, and capabilities to serve the ever-changing needs of external and internal customers" (Moran and Brightman, 2000, p. 66).

Strategic approaches to health care management are needed to deal with the rapid, complex, and dynamic environment facing health care organizations. This requires managers to develop effective strategies in which organizational change is a key ingredient for success (Ginter et al., 2018). Since managers, irrespective of their organizational level, facilitate the operations of their health care organizations, they have an important role to play in helping their organizations create value (Lega et al., 2013, Tsai et al., 2015).

Value-based health care (VBHC) has been suggested as a strategy that can improve health care in terms of shifting the focus from volume to value (Porter and Lee, 2013). The VBHC strategic framework consist of the value equation defined as outcomes that matter to patients in relation to costs and the "value agenda" that consists of six interrelated strategies (Porter and Teisberg, 2006). These strategies suggest that health care organizations need to (1) organize care into integrated practice units, (2) measure outcomes and costs, (3) reimburse care in bundled payments for entire care cycles, (4) integrate care across separate facilities (if one provider cannot offer care for an entire care cycle), (5) expand excellent services across geographical regions (e.g., by establishing satellite facilities), and (6) build an enabling IT platform.

2.1 PSEUDOINNOVATION

Organizational change initiatives in health care often employ management concepts (e.g., quality improvement (QI) approaches). Some examples are Total Quality Management, Business Process Reengineering, Continuous Quality Improvement, and Lean. Many of these approaches have been found to follow life-cycles of three to five years (Walshe, 2009), which raises the question of whether VBHC will follow the same pattern.

In the business sector, management fads have been found to hinder organizational change (Abrahamson, 1996, Birkinshaw et al., 2008). Walshe (2009) has described these and similar fads in health care management as "pseudoinnovation". Because they share so many similarities with their predecessors, the differences seem to lie in terminology rather than in content.

Walshe (2009) hypothesizes that there are two main reasons behind pseudoinnovation. First, pseudoinnovation is perpetuated by knowledge purveyors (e.g., authors of books or research articles, and consultants) who continually offer and sell something new. Second, the new management concepts seem to offer consumers and users a simple quick-fix, allowing them to demonstrate "decisive action" (Brunsson, 1982, Walshe and Rundall, 2001, Choi and Brommels, 2009). This is true, despite the lack of thorough research on their benefits and costs (Walshe and Freeman, 2002).

Both reasons make it difficult for QI tools to penetrate and to be scaled-up in organizations (Walshe, 2009), perhaps because there is not enough time for the cultural and organizational infrastructure to mature (Øvretveit and Staines, 2007). The superficial and incomplete applications of the Plan-Do-Study-Act (Taylor et al., 2013) and Lean (Mazzocato et al., 2010) may reflect this difficulty. In fact, QI initiatives are often hard-fought and slow (Shortell et al., 1998). That a particular QI tool has worked in one organization does not necessarily mean it can work in another organization (Braithwaite, 2018). It is even suggested that organizations should choose one concept, stick with it, and make it work (Walshe, 2009). For example, some health care organizations such as Intermountain Healthcare argue that there is no panacea or unique recipe for implementing successful change (Baker, 2008).

The spread of management concepts differs from that of other medical innovations (e.g., randomized controlled trials) because they are not deeply founded on evidence (Shojania and Grimshaw, 2005). Therefore, Walshe (2009), who recommends taking a skeptical position on new QI methods, calls for an increase in what he describes as theoretical, empirical, and experiential evidence. He concludes that such evidence could facilitate evidence-based management and ultimately lead to better managerial decisions.

VBHC, as a management concept, could become the next pseudoinnovation. Some of its aspects can be considered to be "repackaged". For example, the value equation is similar to an inverted formula for analyzing cost-effectiveness (Detsky and Naglie, 1990). The approach to measuring outcomes is similar to Fries (1983) outcomes model. The way to establishing care cycles, in particular the care delivery value chain, has similarities with the value stream

mapping of Lean (Womack et al., 2005) and clinical pathways (Kinsman et al., 2010). In addition, it also has its roots in management thinking in relation to competition (Porter and Teisberg, 2006). The group of knowledge purveyors who have introduced the concept share similarities with those who often contribute to pseudoinnovation (Walshe, 2009).

2.2 BUSINESS MODELS – UNDERSTANDING HEALTH CARE FROM A DIFFERENT PERSPECTIVE

To better understand how an innovative management concept is disseminated, it can be useful to look at the contextual factors, the user system, the change agency, the knowledge purveyors, and the resource system (Berwick, 2003, Greenhalgh et al., 2004). This suggests that organizations and their ability to adapt to their environment and integrate new management concepts could be understood by looking at particular aspects of how they are organized to deliver care. Health care organizations, therefore, could be studied through the conceptual lens of a business model.

From a historical point of view, the concept of the business model has existed since pre-classical times when it reflected economic and trading behavior (Teece, 2010). However, the term itself was not introduced scientifically until the 1950s, and then only in a very non-specific sense (Bellman et al., 1957, Osterwalder et al., 2005). At the beginning of the Internet era, the term was primarily used to describe operational activities for system modelling (i.e., business process modelling) (Wirtz et al., 2016). An immense rise in the number of articles on business models occurred in the mid-1990s, especially as a consequence of the emergence of e-business (Wirtz et al., 2016, Zott et al., 2011, Osterwalder et al., 2005).

2.2.1 Why use business models?

There has been some criticism of the business model concept (Porter, 2001, Shafer et al., 2005). Porter (2001, p. 73) stated: "The definition is murky at its best. Most often, it seems to refer to a loose conception of how a company does business and generates revenue." In the business world, business models are important for management practice, theory, and policy (Massa et al., 2017, Wirtz et al., 2016, Klang et al., 2014, Demil et al., 2015). Business modeling has even become a core management discipline that is complementary to the disciplines of finance, organization, and accounting (Nielsen and Lund, 2014).

It has been argued that business models are important from a competitive perspective and that they are often strategic managerial priorities since some business models may outperform others (e.g.(Weill et al., 2011, Johnson et al., 2008, Chesbrough, 2007, Ireland et al., 2001). Some very successful and profitable business models have been described, such as Google (Afuah, 2014) and Xerox (Chesbrough and Rosenbloom, 2002).

Business model innovation has been viewed as an additional development that complements product, process, and organizational innovation (Casadesus-Masanell and Zhu, 2010, Massa

and Tucci, 2014). An example of business model innovation is the development of new platform companies with a focus on the network perspective, such as Facebook, YouTube or the video game industry (Cennamo and Santalo, 2013).

Macro-level forces such as information technology (IT) and globalization have required companies to rethink and redesign their business models in an environment characterized by blurred borders, increased rivalry, and reduced entry barriers (Gambardella and McGahan, 2010). These forces can increase the urgency for incumbent organizations to reconfigure their business models and for entrepreneurial organizations to design new business models (Kim and Min, 2015).

Social and environmental value creation has also begun to be described in terms of business models (Dohrmann et al., 2015, Michelini and Fiorentino, 2012, Schaltegger et al., 2012). Profit can go hand-in-hand with innovations that benefit society and the environment, especially in poor and low-income contexts (Lovins et al., 1999, Lüdeke-Freund et al., 2016, Seelos and Mair, 2007)

2.2.2 What is a business model, really?

A business model is not the same thing as a business plan. Venture capitalists and other investors often want to see an entrepreneur's business plan before providing funds. This means they are often used in pre-start up planning stages (Mason and Stark, 2004). Since they detail the current state and supposed future (Honig and Karlsson, 2004), business plans are found in all kinds of organizations. A business model can be embedded in a business plan (Teece, 2010), but is not a static and lengthy written document as the business plan can be (Blank, 2013).

The business model has been described as "a term of art" (Lewis, 1999), a description that seems to suggest that there is no widely agreed-on definition on what a business model really is. Four major reviews of business models have been published in the last decade in the vast and fragmented literature (Wirtz et al., 2016, Klang et al., 2014, Zott et al., 2011, Massa et al., 2017). There are similarities and differences among these reviews. Zott et al. (2011) attempt to describe different business model interpretations and evolutions over time. They describe the business model development in silos – strategic issues, e-business, and technology and innovation management – and as a new unit of analysis that is activity-centered, with an emphasis on value creation and with an organizational systems view. Klang et al. (2014) review the literature with a focus on analyzing the antecedents that explain the paradox of why business models have been criticized and, for example, call attention to armchair scholarship (i.e., the analysis or synthesis of existent scholarship). Wirtz et al. (2016) offer an updated historical development of Zott et al. (2011) review by suggesting that business model opinions among scholars are converging.

Massa et al. (2017) offer one of the most rigorous analyses of business models in the literature. They critically assess the literature but also try to explain the lack of business model definitions. They claim that the different interpretations of what a business model is, to a large extent, depend on the fact that scholars have used different subject-matter lenses. They introduce three

different interpretations – not completely mutually exclusive – of the function of business models: (1) the attributes of "real" firms (hereafter, referred to as attributes of organizations); (2) cognitive and linguistic schema; and (3) formal conceptual description of how organizations work (hereafter, referred to as business model frameworks). These three interpretations are defined next, followed by a summary.

2.2.2.1 Business models are attributes of organizations

> A business model [is] a set of activities, as well as the resources and capabilities to perform them – either within the firm, or beyond it through cooperation with partners, suppliers or customers… [It depicts] the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities. (Zott and Amit, 2010, p. 217 & 219)

This interpretation describes how organizations "do business". The attributes are empirically determined by classifying organizations (a result of measured similarity on certain observed variables). This function has identified business model archetypes and has introduced attributes of business models such as "razor and blade", "crowd-sourcing", "subscription-based", "freemium", "affiliate", and "pay-as-you-go" (Johnson, 2010, Casadesus-Masanell and Zhu, 2010, Rappa, 2010, McGrath, 2010). Research has also empirically tested how business models can explain differences in organizational performance and the value creation sources integral in innovative business models (Amit and Zott, 2001, Weill et al., 2011). Christensen (2013) explains novel ways of organizing business activities according to his theory of disruptive innovation. This business model interpretation also analyzes the role of the competitive dynamics of business models (Casadesus-Masanell and Zhu, 2010).

When accepting the attributes of organizations, some scholars argue that this consists of (1) a set of performing activities and (2) their outcomes (Casadesus-Masanell and Ricart, 2010). The selected activities (including when, who, how, and where) and the capabilities/resources determine the outcomes (e.g., (Amit and Zott, 2001, Afuah, 2004)). Thus, outcome is often described as the created and/or captured value (Casadesus-Masanell and Zhu, 2010, Casadesus-Masanell and Ricart, 2010). All the same, there is little consensus among scholars regarding which activities and resources are needed. The same is true for the outcomes of the activities performed that can be interpreted as value creation and capture only or as both. They can also have different definitions.

2.2.2.2 Business models are cognitive/linguistic schema

> Business model schemas can be defined as cognitive structures that consist of concepts and relations among them that organize managerial understanding about the design of activities and exchanges that reflect the critical interdependencies and value-creation relations in their firms' exchange networks. (Martins et al., 2015, p. 105)

This interpretation means that managers do not have "real" systems (with "real" activities for value creation and value capture) in mind when making decisions. Instead, managers shape their own cognitive frames and images of "real" systems (Chesbrough and Rosenbloom, 2002, Tripsas and Gavetti, 2000). Hence, scholars who see business models as cognitive or linguistic

schemas are interested in understanding how organizational members/roles interpret business models and how this interpretation appears in social interaction. Such interaction consists of sense-making at the organizational level (Ring and Rands, 1989), scanning of the environment and detecting opportunities (Teece, 2007), and identifying mental conceptualizations that inform business model design and innovation (Tikkanen et al., 2005, Amit and Zott, 2015)

The linguistic aspect of this interpretation is based on the idea that business models are not reduced to individual mental models. Rather, they are often rooted in a collective belief in which narratives allow organizational members to communicate a shared understanding of the business model internally and externally (Massa et al., 2017). For example, Magretta (2002, p. 4) explains that business models are "stories that explain how enterprises work".

2.2.2.3 Business models are frameworks

> *A business model is a conceptual tool that contains a set of elements and their relationships allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams. (Osterwalder et al., 2005)*

In particular, this interpretation of business models is useful in trying to untangle some of the complexity by highlighting the most important elements that allow the models to be "written in pictorial, mathematical or symbolic form" (Massa et al., 2017, p. 84) as opposed to the cognitive interpretation that often is implicit, high-level, and less detailed. Business models are simplifications of "real" systems that represent differences in levels of abstraction (Massa and Tucci, 2014). At the level of the organization, the business model is described as a system of interdependent activities, choices and their consequences (Amit and Zott, 2001, Casadesus-Masanell and Ricart, 2010), or as essential business processes such as "a business process viewpoint" (Gordijn and Akkermans, 2003). The simplification of a business model into a framework can be viewed in terms of: meta-models, content, or semantics.

At higher abstraction levels, one needs to look at the meta-models of business models, which are representations achieved by listing and describing their vital elements or components. A widespread model among practitioners and managers is the Business Model Canvas (BMC) (Osterwalder and Pigneur, 2010). It lists nine critical components of a business model that describe many different organizations (value proposition, customer segments, channels, customer relationships, revenue streams, key activities, key resources, key partners, and cost structure). Johnson et al. (2008) describe four critical components (profit formula, value proposition, key resources and processes). Gassmann et al. (2014) describe four dimensions: the who (targeted customer group), the what (value proposition), the how (activities and capabilities used to create the value proposition), and the value (explicit explanations of how profit is made, including costs and revenues).

There are also differences regarding content, for example, the sustainability field, which interprets the local communities and environment as key stakeholders (Bocken et al., 2014).

Perhaps the greatest difficulty with the business model definition problem for scholars is the number of components and their heterogeneity. Even conceptually, similar components can be used with different terminologies (Massa et al., 2017).

Morris et al. (2005), who identified 24 different business model components in their review, found the frequency of the components varied from four to eight. The most frequently used components were the organization's value offering, customer interface/relationships, internal infrastructure/connected activities, economic model, and partner network/roles. According to Wirtz et al. (2016), scholars agree most on the following components: market offerings and resources. There is little agreement on the components of strategy, revenue, and procurement. They introduce an integrated framework that they claim takes all the essential business model components into consideration.

Finally, semantics is the third type of business model framework. An example is the modeling language "e-3 value ontology", which explains how value (economic) can be created and exchanged among actors in a network (Gordijn and Akkermans, 2003).

2.2.3 Perspectives on business models in health care

Three perspectives of business models are discussed in this thesis related to strategy, value, and intra- and inter-organizational analyses.

2.2.3.1 Business model vs. strategy

There is an ongoing discussion about the interrelated hierarchy of business models and strategy (Massa et al., 2017). If business models and strategy were the same, the business model concept would add little value to our current understanding (Seddon et al., 2004). Business models can be seen as more inward looking whereas strategy is more outward looking (Seddon et al., 2004). The view taken in this thesis is that business models are extensions of strategy rather than a new field of research (Massa et al., 2017). While strategy can explain how an organization differentiates itself from its competitors, its business model can describe how that strategy is achieved. Therefore, the business model is a reflection of strategy (Casadesus-Masanell and Ricart, 2010).

Although there is a debate about the existence and value of competition in health care (Porter and Lee, 2013), a good understanding of an organization's business model can lead to insights that align its high-level strategies with its principal operations that, for example, support its competitiveness (Casadesus-Masanell and Ricart, 2010)

2.2.3.2 Views on value: VBHC and business model perspectives

Value is a component in many management concepts (e.g., Lean and the Triple Aim), including VBHC and business models. Porter and Teisberg (2006) present a universal definition for value in health care. In contrast, business model frameworks can have many different definitions of value. Value has different meanings (e.g., economic value, moral value, scientific value) that

apply to different disciplines (Scanlon, 1998, Gray and Jani, 2016), which in essence, means that people (economists, managers, patients) often have different ideas about what value is.

In VBHC, value cannot be realized until it is integrated into a new business model (Kaiser and Lee, 2015) that allows the shift from volume to value to take place. Fair competition on the basis of value requires, for example, that patients and purchasers are able to make informed decisions about where to seek care or how to reimburse providers (Porter and Lee, 2013). Without strategies that allow for quality and cost comparisons, this is difficult (Conway and Willcocks, 1997, Anell et al., 2012).

Business models have been defined as "the rationale for how an organization creates, delivers and captures value" (Osterwalder and Pigneur, 2010, p. 14). This is the definition adopted in this thesis. Therefore, value, even if it is not universally defined, is central to the business model.

Business models are typically developed and analyzed from a commercial point of view, that is, the focus is on profit and loss. In this context, value capture often refers to the mechanisms that support the generation of profit (Stanimirovic, 2015, Bocken et al., 2014). However, as explained above, value in health care can mean much more than profit. For this reason, and particularly in a publicly financed health system, a profit/loss focus can be seen as both provocative and a gross oversimplification of the purpose of health care. This suggests that it is therefore probably necessary to not only adapt business terminology to the health care context, but to define value beyond the scope of profit/loss. This is not unique to business model applications in health care – in fact, business models do not need to be interpreted so narrowly. For example, the business model literature on the social value creation concludes that profit can coincide with innovations that benefit society as a whole, including poor and low-income recipients (Seelos and Mair, 2007, Lüdeke-Freund et al., 2016). As in other social arenas, the goal of service delivery is not only the profit from paying customers but could be a contribution of societal value or public health (Stanimirovic, 2015, Wass and Vimarlund, 2016).

An example of a sustainable value creating business model has been illustrated in birth care. Life Spring Hospitals is a private-for-profit provider in India exclusively for birth care. It has an innovative business model that provides services to poor people at the base of the social pyramid (Esposito et al., 2012, Krishnadas, 2011). Life Spring Hospitals has succeeded in making birth care accessible and affordable by using IT, reductions in the scope of the scarce and expensive physician activities, and transitioning to an extended use of an abundant supply of less well-compensated nurses. Illustrating that there is more than just a focus on profit/loss, this provider reduced costs by 50-70%, and did so without reducing quality of care (Tung and Bennett, 2014).

2.2.3.3 Intra- and inter-organizational business models in health care

The use of a business model framework can be used to understand an organization, i.e. intra-organizational perspective. It could also be used to compare organizations, i.e. inter-organizational perspective.

Health care systems, to a large extent, revolve around the hospital as the central node that tries to do "everything" in the activity of providing both general health care and highly specialized services for complex conditions (Corrigan and Mitchell, 2011, Christensen et al., 2009). However, there is pressure on the traditional hospital business model to move care away from hospitals (Jeurissen et al., 2016). Globally, new and different business models are now emerging that provide care outside hospitals. This phenomenon is expected to continue (Jeurissen et al., 2016). How hospital services are provided and where they are provided will continue to change (Harrison, 2011). Today, many new and innovative business models are being developed for health care delivery, (e.g., (Castano, 2014, Fieldston et al., 2013, Bhattacharyya et al., 2010)), i.e. multiple business models can coexist in the same health care system (inter-organizational perspective).

Taking an intra-organizational perspective, hospitals have traditionally been described mainly as diagnostic solution shops. This is a useful description given the unstructured nature of the problems encountered in hospitals that require experts' intuition and problem-solving skills. In contrast, value-adding processes are suitable when best practices exist and care processes can be standardized, such as at walk-in-clinics (e.g., the MinuteClinic) or at certain focused surgery or cardiology hospitals (Herzlinger, 1997). Thus, in general, it is difficult to develop new business models within an existing health care organization (Corrigan and Mitchell, 2011) because the two business models rely on different processes. These processes require that resources and needs are coupled with different reimbursement logics given that solution shops in theory are paid on a fee-for-service basis. The uncertain diagnostic process can create difficulties in linking outcomes with reimbursement, whereas results for a fixed price are guaranteed in value-adding processes.

Although many hospital activities will continue to have a solution shop character, many hospital services are probably better suited to offer value-adding processes or facilitated user-networks (Christensen et al., 2009). There have been successful attempts at reorganizing surgery as safely and as efficiently as possible in-house (Cook et al., 2014) or in adjacent, free-standing facilities (Porter and Guth, 2012). Facilitated user-networks have shown promising results. One example is the use of networks for Parkinson patients that involve patient self-care (Bloem and Munneke, 2014).

2.2.4 Rationale for this thesis

The consequences of pseudoinnovation can be harmful to health care when the intended improvements do not occur. The use of VBHC, which is a nascent management concept proposed as a promising strategy to "fix" health care (Porter and Lee, 2013), runs the risk of becoming another pseudoinnovation, following the development of management ideas in health care. In

such situations, the business model could contribute to a better organizational understanding, which could lessen the attraction for quick-fixes.

The increasing applications of business models in other industries suggest there could be several uses of business models that are beneficial in health care. This makes the business model an interesting unit of analysis for further study in the effort to better understand the complexities of health care organizations. Nevertheless, if applications of business models are to be of concrete benefit, it is imperative to understand what business models are, which business model frameworks are applicable, and how they can be used in the health care context.

Except for an article by Casadesus-Masanell and Ricart (2010), few studies explicitly make clear their assumptions in researching business models (Massa et al., 2017). This thesis recognizes the three different interpretations of the business model as distinct from each other. For the (1) attributes of organizations, the units of analysis in this thesis are the health care organizations and their partner networks. For the (2) cognitive/linguistic schema, they are the individual and collective minds of health care managers. For (3) the business model frameworks, they are the business model itself and the topic of modeling. This assumes that by (3) isolating important elements and dynamics of health care organizations' activities and performance with a business model framework, it is possible to study (2) managers' conceptualization of the antecedents of organizational performance (leading to a collective identity), and (1) compare different organizations.

Business model frameworks can be applied with intra-organizational and inter-organizational perspectives. The intra-organizational perspective is a way to explore the prerequisites of organizational alignment. If managers in an organization understand the organization's business model, it could aid them in learning to manage the complexities of improvement efforts, adopting to an ever-changing environment (Gioia et al., 2000), and adopting management methods in a way that aligns with the bigger purpose of the organization. From a systems perspective, an inter-organizational perspective can be valuable for the exploration of how organizations in the same system differ as they create value (Hamel and Ruben, 2000), in particular because business models can explain differences in organizational performance and sources of value creation and innovation (Amit and Zott, 2001, Weill et al., 2011).

3 AIM AND RESEARCH QUESTIONS

The overall aim of this thesis is to understand how management concepts about value are understood and to explore how health care organizations in a publicly financed health care system are organized so that they create, deliver, and capture value. Specifically, this thesis addresses the following research questions:

1. How is a nascent management concept (VBHC) diffused and understood in the healthcare literature? (Study I)

2. How have business models been applied in health care? (in particular, which frameworks have been used and how, in which contexts, and for what purpose) (Study II)

3. How do top managers conceptualize a hospital business model? (Study III)

4. How are perinatal clinics' business models similar and different in the same publicly financed regional health care system? (Study IV)

4 METHODOLOGY

This chapter summarizes the research designs for this thesis, including data collection, analysis and context – where relevant – for the four studies that address the research questions. In addition, ethical issues are considered at the end of the chapter. Table 1 outlines the four studies.

Table 1. Overview of the methodology of the four studies

Study	Design	Data sources	Data analysis	Setting
I	Sequential mixed methods	Secondary data: Citation registry data, literature	Qualitative (directed thematic analysis), and quantitative non-parametric)	N/A
II	Systematic literature review	Secondary data: Literature	PRISMA, explanatory synthesis	N/A
III	Qualitative interview study	Primary data: Interviews (n=20)	Directed content analysis Business Model Canvas	Acute care hospital in publicly financed health care system
IV	Exploratory multiple case study	Primary data: Interviews (n=11) Documents Observations	Directed content analysis Business Model Canvas	Perinatal care clinics at a regional, publicly financed health care system

4.1 STUDY DESIGNS

The research questions informed the study designs for the four studies.

Study I used a novel sequential (exploratory and explanatory) mixed-methods study design (Creswell and Clark, 2007) in order to describe how VBHC has been used and understood. Study II was a systematic literature review with an explanatory, synthesis approach. This design was chosen to gather evidence on how the business model concept has been used in health care. The specific interest of Study II was in *how* business model frameworks, which correspond to formal conceptual representations (Massa et al., 2017), had been applied. The assumption was that these frameworks could be used as structured tools to better understand the health care business models examined in Study III and Study IV.

Conducting a systematic review requires assembling the research in a systematic and explicit fashion (Cooper and Hedges, 1994). Variations among the methods can often exist to the same extent found in primary research (Gough and Thomas, 2012) despite the broad distinctions among them as noted by Gough et al. (2012). This study can be regarded as a configurative

review that aims to generate theory and to identify patterns from heterogeneous data rather than as an aggregative review that tests *a priori* theory and describes homogenous patterns (Gough et al., 2012).

Study III was designed as a qualitative interview study that aimed to explore top managers' in-depth conceptualizations of a hospital business model, while acknowledging that business models can function as cognitive schema (Massa et al., 2017). The selected hospital was purposively chosen as a typical case (Patton, 1990) in that it faced contextual challenges in its offer of several value propositions including care delivery, education, research, and development.

Study IV was designed as a qualitative exploratory multiple case study (Yin, 2013) that aimed to explore the similarities and differences in perinatal clinics' business models in the same regional health care system. It is recognized in the study that business models can be defined on the basis of different organizational attributes (Massa et al., 2017). A case study research design was selected because such studies can answer the "how" and "why" questions related to a contemporary phenomenon in a bounded, real-life context. In such a context, which is critical to the phenomenon studied, the researcher has little or no control over events (Miles and Huberman, 1994, Eisenhardt, 1989, Yin, 2013).

The first step in designing case studies is to choose appropriate cases or units of analysis (Yin, 2013). Perinatal care (in Stockholm) was purposively chosen as a unique research setting because the eight perinatal clinics in the study were assumed to have a broad variety of perinatal care business models. In addition, full access was granted by the eight perinatal clinics, which is a prerequisite in organizational research (Gummesson, 2000). The second step is to choose the case study design. A multiple case study was used in which the eight perinatal clinics were analyzed individually and comparatively. The third step is to develop a case study protocol that addresses the purpose of, and approach to, the research.

4.2 EMPIRICAL SETTING - THE SWEDISH HEALTH CARE SYSTEM

The publicly financed, Swedish health care system was the setting in Study III and Study IV for the exploration of intra- and inter-organizational business model applications.

The Swedish health care system is a taxpayer-financed and decentralized single payer system (Rechel et al., 2018). Health care decision-making for organizational and governance issues is principally a shared arrangement between the national government (responsible for health care policies) and the regional governments (responsible for health care delivery and funding, from primary to tertiary care). The municipalities or local authorities are responsible for social care, long-term care, and some public health services. Responsibilities and coordination between the County Councils and the municipalities are regarded as indistinct (Anell et al., 2012).

The regional level consists of 21 regions or County Councils. A belief in New Public Management (NPM) reforms that are intended to stimulate cost control and efficiency has led to a purchaser–provider split in Sweden (Saltman, 2018). This means that the County Councils de-

termine the provider assignment and reimbursement according to contractual agreements. Annual negotiations set fixed, prospective per-case payments based on diagnosis-related groups (DRGs), often complemented with price or volume ceilings and some quality components (Anell et al., 2012).

In general, health care is publicly provided. However, users can also seek health care from private providers. Patients often make small, out-of-pocket payments for treatment. The bulk of health care cost is paid for by the regional reimbursement system according to contractual agreements (Anell 2015). Patients who are treated for emergency care at acute hospitals pay a fee (Study III) although there are no fees for birth care (Study IV).

Since 2007, when the Swedish Association of Local Authorities and Regions (SALAR) was formalized to represent the 21 regions or County Councils and the 290 municipalities, reform decisions have been made jointly by national and regional authorities. In addition to an emphasis on patient health equity, safety, efficiency, and access, one goal has been to strengthen the patient's role and choice in health care. The patient choice option introduced competition to the publicly financed health care system. Although patient choice has become an imperative issue in the health policy agenda, it cannot compete with the promotion of more significant underlying values in Swedish life and health care such as equity (Anell et al., 2012). Currently, many County Councils are on the threshold of significant changes because future demands and plans for health care mean strategies must be developed to coordinate the efforts of health care providers from primary to university hospital care (SLL, 2011).

4.2.1.1 The university affiliated acute general hospital

The university affiliated hospital of this research, with its education and research commitment, is a "complete" hospital that conducts elective and emergency care with a focus on common diseases in the general populace. The hospital has approximately 500 beds and 4000 staff members. More than 100 000 emergency patients visit the hospital annually. Because the hospital does not use a gatekeeper function, anyone can seek emergency care. Referrals, however, are needed to access elective, specialized care.

To facilitate a more independent and decentralized hospital governance system, the hospital is incorporated as a County Council-owned limited company. The County Council elects the board of directors that in turn chooses a CEO. The CEO chooses a top management team of managers with central administrative functions in the hospital's clinical departments. Hospital governance is integrated by the complex coordination of medicine and management systems (Kuhlmann et al., 2016) with managers at several different levels below the top management team.

4.2.1.2 Perinatal care clinics

The eight perinatal clinics of this research had a range of delivery models plus different ownership structures (public and private), different facilities (hospital-based, alongside-hospital,

and free-standing clinics), and different offerings (standard care and birth center care). A perinatal care clinic was defined as the whole organization of ante-, peri- and postnatal wards that provide care in the period prior to, during, and after birth according to the contractual agreements of perinatal care with the purchaser, the Stockholm County Council. Table 2 presents an overview of the eight perinatal clinics.

Table 2. Overview of the different delivery options among perinatal clinics

Perinatal clinic	**Ownership**	**Gestational age in weeks according to contract**	**Care offering**	**Type of facilities**
Clinic A	Private (100%)	≥32+0	Birth center care	Free-standing
Clinic B	Private (51%) Public (49%)	≥28+0	Birth center care	Alongside-hospital
Clinic C	Public	≥37+0	Standard care	Hospital-based
Clinic D	Public	≥37+0	Birth center care	Alongside-hospital
Clinic E	Public	≥28+0	Standard care	Hospital-based
Clinic F	Public	≥28+0	Standard care	Hospital-based
Clinic G	Public	≥26+0	Standard care	Hospital-based
Clinic H	Public	≥22+0	Standard care	Hospital-based

Before 1920 in Sweden, most women gave birth at home. Thereafter, labor care moved into "birthing houses". Originally, these birthing houses were located separate from the hospitals but adjacent to other hospital services. During the 1970s, when the last birthing house closed, perinatal clinics became entirely hospital-based in acute hospitals on the assumption that hospitals provided greater safety. However, midwives have argued for birth center practices as a reaction to the "medicalization" of normal childbirth labor. According to these practices, pregnant women can control their labor without the unnecessary involvement of hospital staff and the use of medical equipment. Midwives work at small-scale, non-clinical environments in the same team to provide ante-, peri-, and postnatal care. They consult obstetricians only as needed (Højeberg, 2009).

The first Swedish alongside-hospital clinic was established in 1989 to provide birth center care (SLL, 2014a). Since then, additional alternatives for birth center care have emerged. In 2009, the Stockholm County Council introduced a patient choice reform that was intended to better meet patient demands given that births rates were estimated to increase by 25% in the next ten

years. This meant that any provider (private or public) that met the accreditation criteria for the delivery of care for low and mid-risk perinatal care could open a new health care services initiative. In 2014, a new privately owned and operated clinic was opened. Thus, this alternative allowed additional insight into how perinatal care is provided.

4.3 DATA COLLECTION AND ANALYSIS

The study designs informed the kinds of data and methods needed to conduct the research. For Study I and Study II, extant research (secondary data) was collected and analyzed. For Study III and Study IV, primary data from an empirical setting were collected and analyzed.

4.3.1 Study I

Traditionally, in an explanatory sequential design, quantitative data collection and analysis constitute the foundation for the subsequent qualitative data collection and analysis; the collection and analysis process is vice versa in an exploratory sequential design. This study began with an exploration of quantitative data followed by alternating qualitative and quantitative data collection and analysis, in stepwise manner that revealed how VBHC has been used and understood. Steps (1), (3), and (6) involved quantitative analysis, whereas Steps (2), (4), (5), and (7) involved qualitative analysis.

In Step (1), a seminal article was identified that was the most-cited article in the Web of Science (to 2 May 2014). In Step (2), thematic analysis (Braun and Clarke, 2006) was used to identify key conceptual aspects in the most-cited article by grouping codes into themes or key conceptual aspects. This corresponded to a nominal scale. In Step (3), articles that cited the most-cited article were collected (up to May 2, 2014), and relevant text was identified. In Step (4), the text from the collected articles was coded based on the conceptual aspects from the most-cited article. In Step (5), these conceptual aspects were categorized according to the ordinal scale of structure of the observed learning outcomes (SOLO) taxonomy (Biggs, 1979) as a way to evaluate understanding. This scale, which is often used to characterize students' learning, was assumed transferable to researchers' learning.

SOLO taxonomy has five levels. The three lower levels correspond to surface approaches to learning. The two top levels define deeper learning (Boulton-Lewis, 1994). In this study, *prestructural* refers to missing the point; *unistructural* refers to one relevant aspect; *multistructural* refers to several relevant, although independent aspects; *relational* refers to different aspects that are integrated and enabled comparisons; and *extended abstract* refers to the demonstration of generalizations in new contexts and/or a further development of the concept (Biggs and Tang, 2003).

In Step (6), statistical analyses were performed on the data acquired in the previous steps. These analyses entailed descriptive and inference statistics using medians and interquartile ranges (to understand which aspects were used and how well concepts were understood). Non-parametric tests were used because the data were categorized into nominal and ordinal scales so as to assess how different conceptual aspects changed over time. Longitudinal analysis, $\chi 2$ test for

trend (MedCalc V.14.10.2) was used. In order to evaluate the non-normally distributed correlations of levels of understanding (SOLO) and the impact factor and publication year, Spearman's Rho tests were used (IBM SPSS Statistics V.22). In Step (7), an in-depth examination of the statistics was conducted in order to better interpret the findings.

4.3.2 Study II

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was used to enhance the transparency of the reporting. This required taking a rigorous approach to the identification, screening, eligibility decision, and selection of articles with discernable business model frameworks. The two largest medical databases (PubMed and Web of Science) and EBSCO's Business Source Premier were searched from January 1, 1975, through August 10, 2015. Appendix A presents details on the search strategy and study selection.

Management reviews that take an explanatory synthesis approach are common (Briner and Denyer, 2012). In this study, such an approach was used to explain how business models have been used in health care. The study was inspired by a realist review (Pawson et al., 2005) that assumes complex social interventions can yield different outcomes in different contexts and can result in aggregated analyses of program theories with different relationships between context (C), intervention (I), mechanisms (M), and outcomes (O). In Study II, this was translated such that a particular type of business model framework (F), with its associated elements and data, is applied (A) within different health care contexts (C) and can generate different outcomes (O). This Context-Approach-Framework-Outcome (CAFO) structure was used to guide the data collection and analysis.

4.3.3 Study III and Study IV

The BMC was used as the analytical framework to collect and analyze data in Study III and Study IV. Data collected consisted of interviews (Studies III and IV) and documents and observations (Study IV). Data analysis was performed with a directed content analysis approach.

4.3.3.1 BMC as a framework for data collection and analysis

Although, the explorative nature of Study II did not focus on the usability of respective business model frameworks, some aspects were captured when assessing how the business model frameworks were used in the studies of Study II, which helped inform the choice of business model framework. The advantages were tied to the framework content and visual configuration. The BMC and its predecessor, the Business Model Ontology (BMO), were the most commonly used frameworks for making business model analyses in systems (Stanimirovic and Vintar, 2014, Stanimirovic, 2015) and for drawing comparisons between organizations (Chen et al., 2013, Desai, 2014, Kimble, 2015). Both models were comprehensive and were used in many different settings.

Compared to the other frameworks, the BMC considers many different aspects (Wirtz et al., 2016) in its single organization focus. The use of the BMC contrasts with a network-centric

approach (Bankvall et al., 2017) although it also includes external partnerships (Mettler, 2014, Osterwalder and Pigneur, 2010). From an organization-centric perspective, the BMC helps conceptualize a business model in a user-friendly and graphically appealing way that facilitates communication (Massa et al., 2017) of "the rationale for how an organization creates, delivers and captures value" (Osterwalder and Pigneur, 2010).

The BMC has four business domains with nine constituent components: the product or service (value proposition), value delivery through the customer interface (customer segments, customer relationships, channels), value creation through the infrastructure management (key activities, key resources, key partners), and value capture through financial viability (cost structure, revenue streams) (Osterwalder and Pigneur, 2010).

The *value proposition* is central to the particular services organizations deliver to different *customer segments*. *Channels,* which are part of the customer interface, describe the avenues taken to reach customer segments. *Customer relationships* refer to the kinds of interactions with customers.

To create value organizations use infrastructure elements that include the *key resources* used in different ways to perform *key activities. Key partners* help organizations optimize, reduce risk, or acquire certain resources through outsourcing. Together, the infrastructure management determines the *cost structure* (i.e., what it costs to operate the business model). This structure must be balanced with *revenue streams,* which are the way organizations are reimbursed for offering certain value propositions to customer segments.

The original business model elements were retained without adaptation to the health care setting because the exploratory nature of the aims of Study III and Study IV. Figure 1 is a graphic modification of the merger between the BMC and BMO in order to highlight the interrelationships between the nine elements.

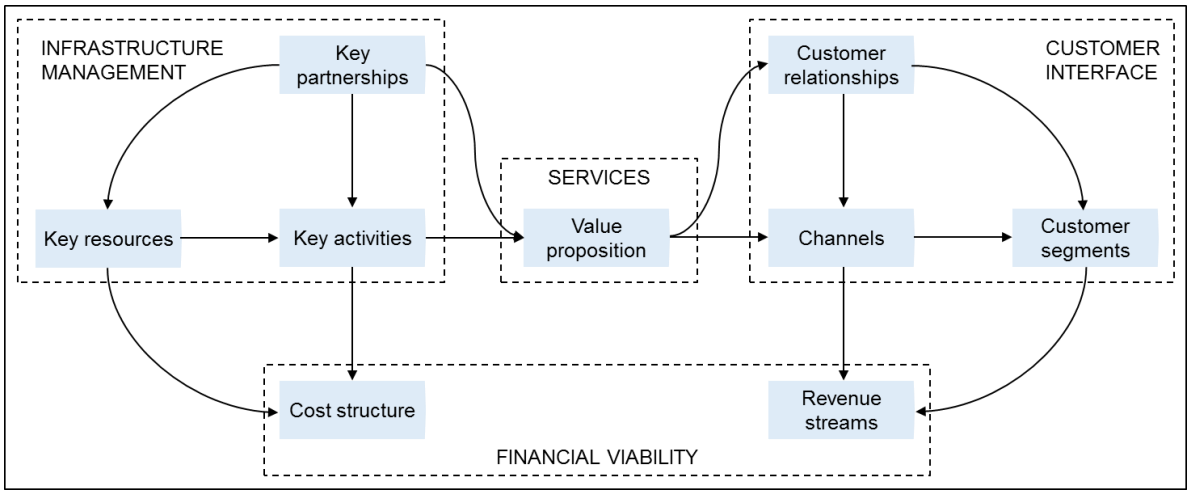

Figure 1. Adapted merger of the BMC and BMO

4.3.3.2 Interviews

The interview approach is a recognized research method for gathering and interpreting people's experiences, opinions, attitudes, and approaches. Therefore, interviews with relevant study participants, which are often used in qualitative studies (as in Study III), are important data sources in case studies to acquire a deeper understanding of a phenomenon (as in Study IV). Because a fluid interview flow is preferred to a rigid interview flow (Rubin and Rubin, 2012), the interviews were conducted as guided conversations rather than as structured sets of questions. The conversations were open-ended. The interviewees were asked to reflect on different facets of a business model guided by the BMC (Appendices B and C).

4.3.3.3 Interview sample

A purposive sampling technique was used to identify key interviewees (Patton, 1990). As a result, interviews were conducted with the top management team at the acute hospital (Study III), and with clinical managers and head midwives at the eight perinatal clinics (Study IV). These individuals, who had the most decisive decision-making roles, could provide an overall perspective on the perinatal clinics and the hospital, respectively, plus a comprehensive business model description.

The managerial roles correspond to decision-making levels at the regional health care systems: the meso-level (Study III) and the micro-level (Study III and Study IV). At the meso-level, the hospital has the authority to make institutional decisions without macro-level regulatory constraints. The everyday, operational management of staff and work occurs at the micro-level (Saltman et al., 2011).

In Study III, the top management team was the total sample (Robinson, 2014) that consisted of the hospital's CEO, the Chief Financial Officer, the Chief Information Officer, the Personnel Officer, the Hospital Services Manager, the Communications Manager, the Chief Medical Officers, and the managers of all clinical departments . Sixteen of the interviewees were trained physicians. Fifteen of the interviewees were women.

For Study IV, thirteen clinical managers and midwife managers were invited to participate in the research; eleven of these invitees consented to be interviewed.

4.3.3.4 Documents and observations

Documents and observations are important data sources in case study research. Such evidence should be confirmed by evidence from other sources (Yin, 2013). In this research, documents and observations complemented and confirmed the interview data. The document data were acquired from publicly available sources: annual reports, perinatal clinic websites, social media websites, newspaper outlets, and miscellaneous reports. Notes were taken in the observations on the discussions and the contextual organizational environment. Observations included staff member appearance and conduct, ward resources, and data on the process and content of the service offerings.

4.3.3.5 Content analysis

Directed content analysis (Hsieh and Shannon, 2005) was conducted in both Study III and Study IV. Each interview was regarded as an individual unit of analysis – a case (Graneheim and Lundman, 2004). A "codebook", which resembled the elements of the BMC, was used to establish agreement of the element content among the articles according to a system of coding and analysis.

Each case was analyzed. Different meaning units were identified, coded, and categorized according to the BMC elements using QSR NVivo v.11.0 (Study III) and Microsoft Excel v.14.4.4 (Study IV). In Study IV, documents and observations were used to complement each element of the BMC in the cases. Interrelations between elements were also coded. Each BMC was then transferred to Microsoft PowerPoint 2013 (Study III and Study IV) in order to visualize each case more clearly and to identify differences in the importance of the interconnections among the elements. Narrative summaries of business models were written that could more easily explain the links among the elements for the researchers. The case comparisons were an inductive process that facilitated the grouping of homogenous categories, specifically in Study IV, where the differences among the perinatal cases were analyzed and summarized from value creation, delivery, and capture perspectives.

4.4 ETHICAL CONSIDERATIONS

Ethical approval was sought and granted for Study III and Study IV (Dnr: 2014/439-31/5 and 2015/452-31/5), although this research was intended to add value without causing harm to patients or staff. Study III and Study IV do not focus on individuals. Rather, they focus on the organizational business models and their representation of associated strategies. However, there could be some risk of negative consequences for the people from the studied organizations. This risk was discussed and approved by the regional ethical committee, as described next.

No direct risks or complications were expected from the interview approach or the case study approach. The data collection process was conducted so that it did not interfere with the individuals' work or endanger the patients. The interactions with the staff were conducted using interviews and observations.

In all the hospital and perinatal clinic interactions, written and oral information about the project was given to the participants. Their informed consent was obtained. Everyone retained the right to withdraw from the study at any time. The collected data were analyzed and reported so that all participants would be anonymous as far as feasible. Due to the inherent public nature of the cases studied, some participants may be identifiable despite these efforts. In addition, interviewees were given as much transparent and complete information as possible on the studies – before, during, and after the interviews and observations.

Certain ethical issues were considered during the research. For example, there were the risks of infringing on the staff members' personal integrity and of causing possible discomfort as

they commented on various organizational matters in the interviews. For example, the questions about the customer concept in relationship to the patients might cause some uneasiness for some interviewees. However, these risks were assessed as minimal given the nature of the topics discussed and the benefit of acquiring knowledge compared to "harming" the participants or to their patients.

In total, the two studies increase the understanding of the organizations´ business models and of their underlying strategies and decisions. These are the significant benefits of this research that had very little risk of harm to the participants.

5 KEY FINDINGS

This section summarizes the key findings of the four studies.

5.1 STUDY I: VBHC IS SUPERFICIALLY UNDERSTOOD IN THE LITERATURE

The article titled "What is value in healthcare?"(Porter, 2010) was the most-cited article (and a seminal article) in which the four key conceptual aspects were identified: "value", "outcomes", "payment," and "system". Value (51%) and outcomes (23%) were the most-cited and best understood (reflected in SOLO-level) aspects (Table 3).

Table 3. The number of citations and SOLO-level for each aspect in the citing texts

Aspect	**Number of citations (%)**	**Median SOLO-level (IQR)**
Value	131 (51.4%)	2 (0-2)
Outcomes	59 (23.1%)	2 (1-3)
Payment	26 (10.2%)	1 (1-2)
System	39 (15.3%)	1 (0-2)
Total	255 (100%)	2 (0-2)

(IQR, interquartile range)

Many articles demonstrated a superficial understanding (SOLO-level 0-2 or prestructural, unistructural, and multistructual) of the conceptual aspects although more than 25% demonstrated no understanding (pre-structural) (Figure 2). In total, 54 articles were empirical studies. Of the articles with SOLO-level 3 cited texts, only five articles applied one or more of the aspects empirically. (See Appendix D for examples of texts that cite all SOLO-levels).

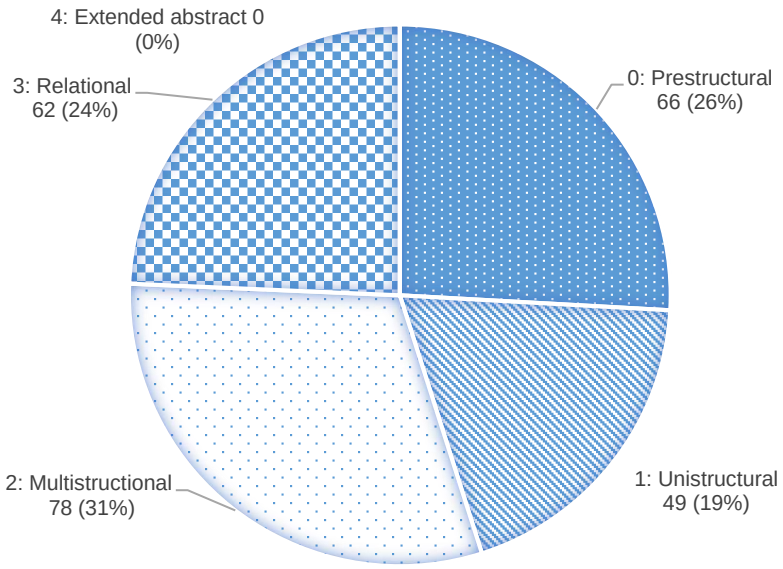

Figure 2. The distribution of the SOLO-levels among the citing texts

Furthermore, the level of understanding did not change over time. This understanding was, however, deeper among authors who repeatedly cited the Porter article and was also inversely related to the journal impact factor (Table 4).

Table 4. Spearman's ρ-correlations between SOLO-level, impact factor, and repeated citations per article

	Frequency	**Impact Factor**	**Number of repeated citations per article**
SOLO citing text-level	255	-0.147*	N/A
SOLO article-level	186	-0.208**	0.321**

(= p<0.05; **=p<0.001)*

5.2 STUDY II: SIX APPROACHES TO INCREASED BUSINESS MODEL USE

The database search resulted in 1659 articles. After removing duplicate articles, 1109 articles remained. After screening these 1109 articles, 755 articles remained. After excluding articles that had no discernable business model framework, 139 articles remained that could be used in the in-depth qualitative analysis (Figure 3).

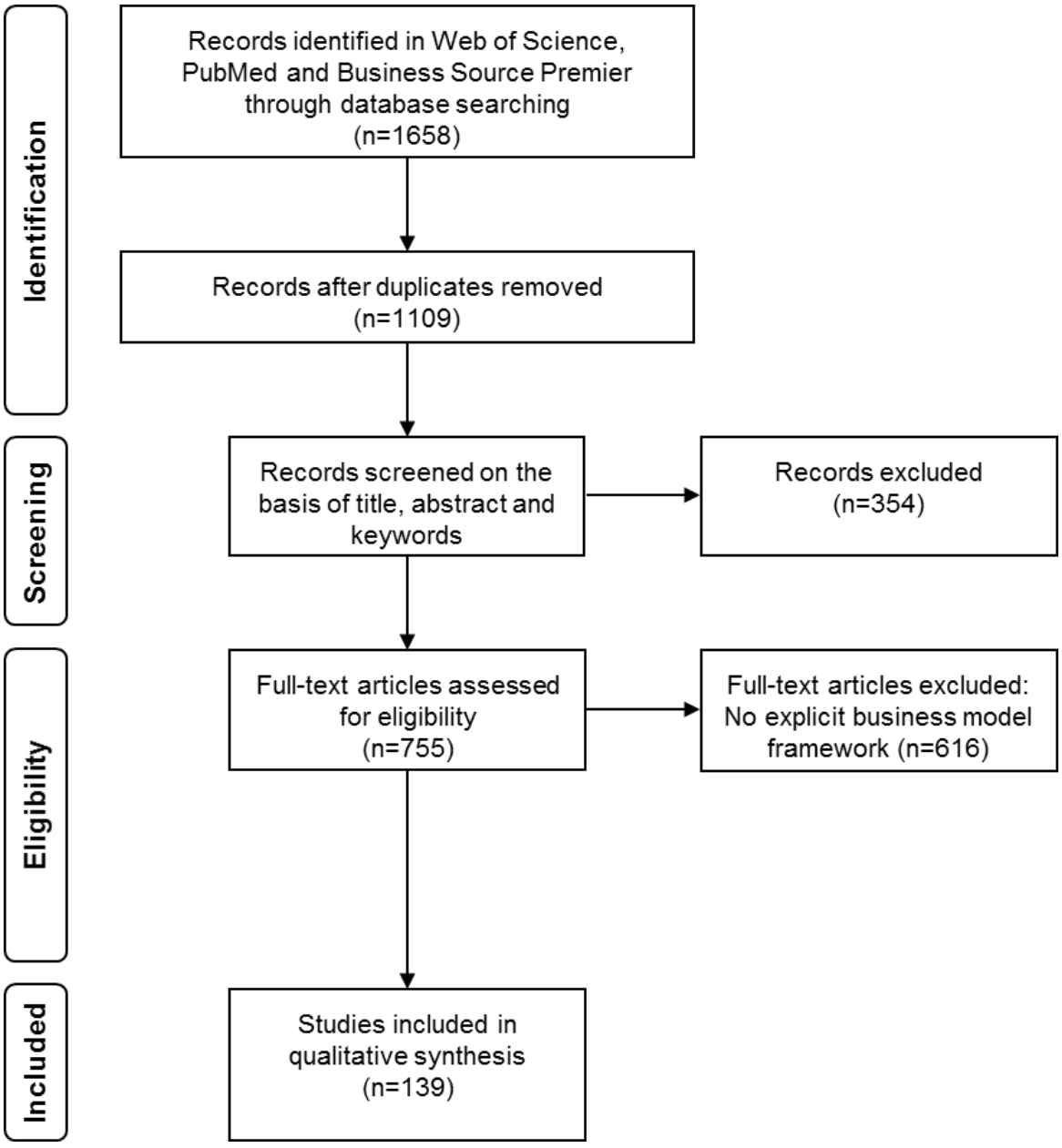

Figure 3. PRISMA flow diagram

Among the 755 articles, which were assessed for eligibility, a noteworthy and continuous business model increase was observed beginning in the 2000's and continuing forward (Figure 4).

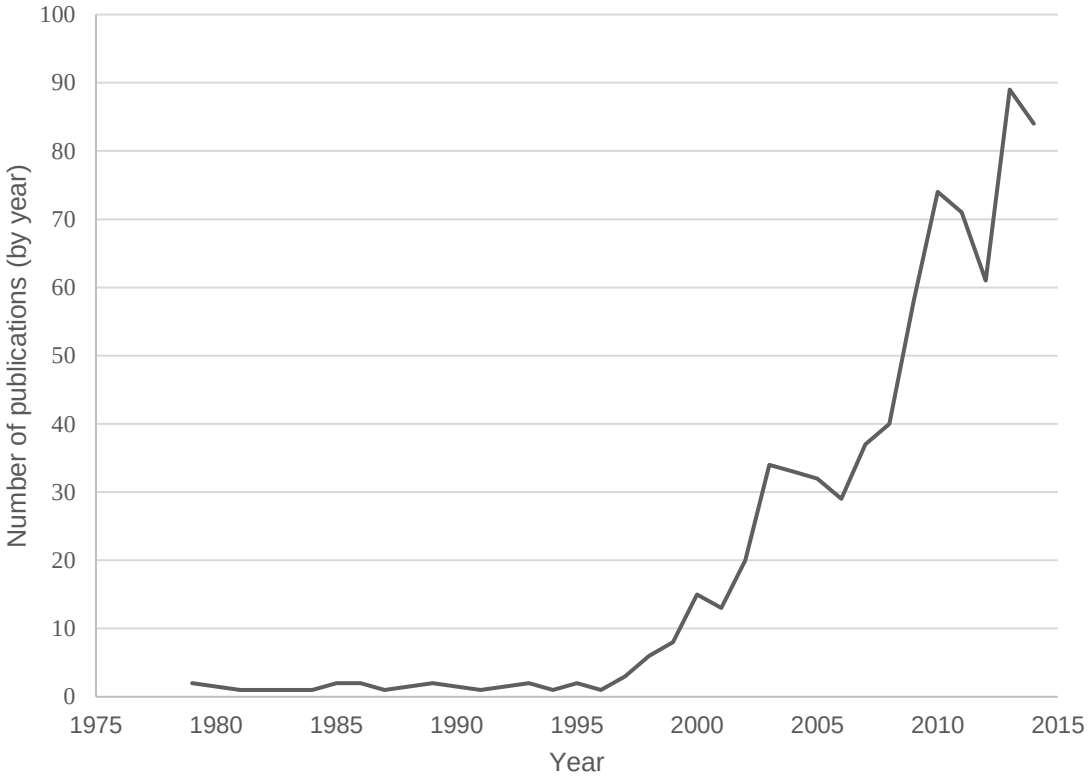

Figure 4. The increasing spread of business model articles in health care

The majority of the business model frameworks in the qualitative synthesis had been previously described in the literature. There were large variations in the frequency of the business model elements, the element content, and the abstraction level of the elements. The BMC and the BMO (Osterwalder, 2004, Osterwalder and Pigneur, 2010) were the most commonly used frameworks (n=14), followed by the Johnson et al.'s (2008) framework (n=6), the Balanced Scorecard (Kaplan and Norton, 1992) (n=4), and the Service, Technology, Organization and Finance (STOF) model (Bouwman et al., 2008) (n=4). The frameworks, which were primarily used in e-health, often lacked empirical data.

Six general approaches to business model frameworks were identified (Appendix E describes the approaches used in the articles).

1. Description frameworks were used to define elements particular to and essential for a specific business model.
2. Financial assessment frameworks were used to assess only the economic aspects with a minimum of elements.
3. Classification frameworks were used to classify and differentiate between business models according to predefined typologies, which centered on those few elements essential to a specific setting.
4. Analysis frameworks included many well-balanced elements that facilitated understanding the data and the relationship among particular elements or for comparing different business models.

5. Development frameworks were used to visualize processes or to balance internal and external elements in order to develop innovative business models.
6. Evaluation frameworks were built upon elements from several different frameworks that were internally and externally focused and were used to determine the value of a business model.

Different patterns of CAFO-configurations were found among these six approaches (Table 5). The approaches reflected a progression from rather simplistic approaches to more complex and comprehensive approaches. Description frameworks were influenced by the context choice and by the number of elements, which ranged from only a few to many. Financial assessment and classification frameworks, which were similar, focused on a few key aspects. Analysis, development, and evaluation frameworks had several elements with a more balanced mix of internal and external elements. While the same business model frameworks could be used with several approaches, established frameworks tended to be used more comprehensively for analysis, development, and evaluation.

Table 5. Summary of the business model approaches based on generalized CAFO-configurations

Approach	**Describe**	**Financially assess**	**Classify**	**Analyze**	**Develop**	**Evaluate**
Context	Care processes and networks/systems	Patient, therapeutic, and research services	Wide range	Organizations, systems, and services	Clinical and non-clinical services, predominantly e-health	Wide range
Framework	Variation of number of elements but unique for each case	Different financially focused elements	Few elements	Many well-balanced internal and external elements	Process modeling tools and many and well-balanced internal and external elements	Many and well-balanced internal and external elements
Data	Not used	Financial	Interviews, observations, surveys, databases	Case studies, interviews, surveys, observations, literature, databases	Ranged from none or unspecified to action research, case studies, interviews, surveys, observations, literature, databases	Ranged from unspecified to case studies, interviews, literature
Outcomes	Description of elements relevant for a specific business model	Differentiation between reimbursement models or determination of financial viability	Classification based on key elements	Analysis of relationships between elements or between business models	New business models	Determination of the value of specific business models
Frequency	n=19 (13.7%)	n=11 (7.9%)	n=11 (7.9%)	n=39 (28.1%)	n=52 (37.4)	n=7 (5.0%)
Unique attribute	Context specific	Focus on a few key aspects		Most balanced with several included elements		

5.3 STUDY III: DIFFERENT MANAGERIAL VIEWS OF THE HOSPITAL BUSINESS MODEL

The managers conceptualized different hospital business models. In addition to a tendency for the managers to focus on their department's responsibilities, the managers' business models (composition of BMC elements) differed primarily in how they defined their customer segments and viewed the tension between espoused and *de facto* value propositions.

5.3.1 Customer segments' impact

Five substantial customer segments were identified: patients, relatives of patients, employees, other hospital departments, and the purchaser.

5.3.1.1 Patients

In varying degrees, elective care (i.e., chronic and perinatal care) and emergency care pathways were represented at all clinical departments. Managers with a larger focus on elective care focused more on establishing long-term relationships with patients that would increase customer satisfaction and encourage repeated contacts. They also thought word-of-mouth appraisals were an important channel for patient retention and recruitment. In addition, social media were viewed as valuable channels. Marketing was essential for attracting patients and increasing patient flows and revenue streams. The individuals who made referrals were key partners in maintaining a patient base. In contrast, managers with a larger focus on emergency care thought that patient relationships and patient flow activities were abundant. Patient visits were merely a one-time encounter. Geographic proximity was the key reason for care choice, irrespective of hospital access by ambulance, referral, or patient preference.

5.3.1.2 Relatives of patients and employees

The managers for the administrative functions (with no patient contacts) identified relatives patients and employees as customer segments. This finding shows how infrastructure elements (key resources, activities, and partners) and customer relationships/channels were organized to include relatives in the patient-care giver relationship and to retain and recruit employees.

5.3.1.3 Other hospital departments

Some departments (e.g., anesthesiology and imaging) had revenues from providing services to other hospital departments. They viewed these departments as customers. Their key activities were designed to meet the other departments' requests. However, customer relationships and channels were underdeveloped.

5.3.1.4 The purchaser

The managers for the administrative functions saw the purchaser (the County Council) as a customer rather than as a partner, although the latter was viewed as more beneficial. Irrespective of purchaser definition, channels and relationships were underdeveloped. They consisted of meetings and reports focused on negotiating care production contracts. A synchronized view of

how best to align the business model (elements) with a shared vision on the delivery of care was lacking.

5.3.2 Competing espoused and *de facto* value propositions

Managers struggled with interpreting the competing espoused and *de facto* value propositions. The espoused value proposition reflected the managers' idealization of the hospital role in the health care system that consists of care delivery, research, and education, all aimed at needed development. However, the competing *de facto* value proposition was more focused on balancing the costs and revenues that were determined by the production-oriented contracts with the County Council.

However, the managers' responses to balancing costs and revenues differed. Managers who saw their departments as critical to the hospital value proposition knew they would receive funds to cover any deficits. Yet they spent a considerable amount of time discussing finances. On the contrary, managers who saw their departments as less critical to the hospital value proposition were more likely to express concern over cost cutting or outsourcing. They were concerned with approaches to cost efficiency in terms of innovative care processes that could, for example, improve the coordination with primary and specialty care so as to reduce unnecessary referrals.

5.4 STUDY IV: FOUR DISTINCT PERINATAL BUSINESS MODELS

Among the eight perinatal clinics, four business models were identified – New Thinkers (NTs), Local Service Provider (LSP), Continuous Capacity Keepers (CCKs), and Hybrid. There were similarities and differences among the models with respect to value creation, delivery, and capture – from the innovative institutions (NTs and LSP) to the more traditional institutions (CCKs and Hybrid). In essence, the NTs demonstrated innovation for each of the business model elements; they had a new way of thinking about perinatal care. The LSP tailored its value proposition for low-risk families primarily in the local community. The CCKs, which were large-scale institutions, were very medically oriented and treated all patients, regardless of cost or complexity. Finally, the Hybrid combined features of the other models: the NTs' value proposition and key partner structure, the LSP's low-risk customer segment, and parts of the CCKs' infrastructure management.

Concerning value delivery, customers were defined differently. The interactions with them differed – from receipt of services in a medical environment (CCKs) to co-creation in a non-clinical environment (NTs, LSP, and Hybrid). The main difference in value creation was in how the clinics cooperated with key partners, used and valued key resources (staff), and focused on care delivery, improvement, and innovation. Value capture was underdeveloped in all business models. The focus on financial viability was uni-dimensional – either on costs or on revenues, with little attention paid to their interconnectedness. Table 6 shows an overview of the four distinct perinatal business models.

Table 6. Four distinct perinatal business models

	New Thinkers	**Local service provider**	**Continuous capacity keepers**	**Hybrid**
Clinic characteristics	Semi-private clinic B and private clinic A	Public clinic C	Public clinics E-H	Public clinic D
Value delivery **(Customer interface)**	Alongside-hospital or freestanding, small-scale care delivery focusing on continuity and co-creative relationships with low- medium-risk families in a non-clinical environment (birth center care)	Hospital-based, small-scale care delivery focused on providing standard care to low-risk families in a non-clinical environment with an explicit focus on contributing to the local community	Hospital-based, large-scale care delivery focused on providing standard care for low to high-risk patients regardless of cost or complexity in a medically-oriented environment	Along-side hospital, small-scale care delivery that shared the NTs' value proposition of a natural, co-created, birth center care experience with continuity in a non-clinical environment but was, like the LSP, exclusively for low-risk patients
Value creation (Infrastructure management)	A "we-house", where managers viewed employees with their experience and broad competences as integral to and a key resource for innovation and organizational development along the entire integrated maternal, birth and postnatal care pathway. A high level of staff autonomy, a positive work environment, and a flat organizational structure enabled quick and informed decision-making.	Key resources consisted of well-balanced experts for the local community's needs, for example, home-births and multicultural sensitivity. The organization was small-scale and led by a trained manager, which facilitated key activities such as quick decision-making and increased adaptability to external demands. Integrated birth- and postnatal wards.	In order to provide highly specialized care, highly competent and experienced staff were needed. High turnover rates meant staff training was a key activity. A stable, but hierarchical bureaucratic organizational structure.	Integrated maternal, birth, and postnatal wards allowed the flexible use of staff.
Value capture (Financial viability)	Private ownership decreased the financial risk for the purchaser but created greater financial vulnerability without a hospital to support a budget deficit. A focus on increasing the revenue stream through novel communication strategies and key partnerships that increased patient in-flow.	A more remote location limited patient in-flow. This was compensated for by a hospital that could support costs and by purchaser agreements that enabled offering home-births and contributed a buffer capacity for seasonal birth peaks in the county.	An established reputation contributed to patient volumes and thereby revenue streams. A focus was on cost-cutting and also budget deficits that could be absorbed by the hospital.	Key partnership to increase patient in-flow and revenues. A focus was on cost-cutting and also budget deficits that could be absorbed by the hospital.

6 DISCUSSION

This chapter discusses the four studies in relation to the literature. In summary, VBHC was superficially understood in the literature (Study I). There has been a large increase in the use of business model frameworks, with their broad variety of elements, primarily in the domain of e-health. Six general approaches of how frameworks are used (to identify essential elements, assess finances, and classify, analyze, develop, and evaluate organizations) were found with few empirical applications (Study II). The empirical use of the BMC helped explore deconstructed business model elements and their alignment. This contributed to identify that managers conceptualize a hospital differently, primarily derived from how business model elements interact in relation to customer segments, and the tension between espoused and *de facto* value propositions (Study III). In addition, four distinct perinatal business models emerged; some models took a more innovative approach while others took a traditional legacy approach to the creation, delivery, and capture of value (Study IV). In addition, the chapter discusses methodological considerations from a philosophical position and from a trustworthiness perspective.

6.1 SUPERFICIAL UNDERSTANDING AND AMBIGUITY

VBHC and business model frameworks are commonly and increasingly used to try to improve value in health care. Value was the primary reason for referencing VBHC. Value was also an element in many of the business model frameworks. Value was interpreted variously: as a purely financial concept or as a description of the service offering, which is often referred to as the value proposition. These different foci could increase the ambiguity identified among the frameworks with respect to the elements that should be included in a business model. This ambiguity could be linked to many ways of viewing organizations (Dutton et al., 1994).

In VBHC, the superficial understanding identified in low SOLO-levels may have reflected poor levels of understanding, or "least effort behavior" (White, 2011) in following the most-cited research, or even just careless referencing (Goodrich and Roland, 1977, Evans et al., 1990). The low levels of understanding could result in a superficial adoption, lacking in sufficient rigor that will result in scale-up difficulties and pseudoinnovation (Walshe, 2009). A continual reflective learning process could reduce skepticism (Thor et al., 2004) as well as contribute to the training that has been identified as a success factor for implementing or developing QI models (Powell et al., Laffel and Blumenthal, 1989).

The majority of the excluded articles in Study II lacked a discernable framework and merely used the "business model" term as a way to describe how to do business non-conceptually. This is consistent with criticism by some scholars that the business model concept loosely describes how revenues are generated (Porter, 2001, Shafer et al., 2005) but may also be a reflection of the ambiguity generally surrounding the concept (Wirtz et al., 2016, Massa et al., 2017). This ambiguity may be, as in VBHC, the unreflective adoption of a buzzword (Magretta, 2002). Additionally, the ambiguity may be the result of applying models grounded in different

conceptual lenses or of using different terminology for similar elements (Massa et al., 2017, Zott et al., 2011, Wirtz et al., 2016, Klang et al., 2014).

In Study II, the data population of frameworks was not common. Furthermore, empirical data was almost entirely lacking as far as examples of applications of business model frameworks at organizations. This suggests that applications of business model frameworks are still at a nascent stage in health care and that the potential may not yet have been realized. The increased use of empirical data could reduce the ambiguity around the business model concept by more clearly anchoring conceptual models in real world situations.

6.2 MULTIPLE CO-EXISTING BUSINESS MODELS WITHIN AND ACROSS ORGANIZATIONS

The empirical application of the BMC identified multiple co-existing business models at a hospital organization and at the same specialty in the health care system.

6.2.1 Can business model alignment address silo thinking?

The business models of the managers differed significantly (Study III). In the highly differentiated professional bureaucracies of complex health care organizations, coordination and integration are required for departments and clinics to function effectively and efficiently (Glouberman and Mintzberg, 2001a, Glouberman and Mintzberg, 2001b). It is likely that the hospital and its departments would benefit if there were greater harmonization among the managerial business models. This could facilitate achievement of hospital and department goals. Much of the business model literature in health care (Corrigan and Mitchell, 2011, Christensen et al., 2009, Hwang and Christensen, 2008) has focused on care production to the extent that teaching, research, and development have been neglected. These are areas that are essential in the development of health care in all its complexity. Historically, hospitals have organized themselves around clinical specialties to support knowledge creation and continual professional development (Flexner, 2002). Over time, however, this practice has led to fragmentation and silo thinking (Light and Dixon, 2004, Porter and Kaplan, 2016) as each specialty develops its own business model. Moreover, differences in the business models were also linked to the areas of managerial responsibility (e.g., managing a clinical department or a support function).

In organizational theory, an organization is created by individual actors who join together to achieve something they cannot achieve separately. Efficiency gains are achieved through some degree of subservience to a higher organizational authority. When cooperation and collaboration break down, then behaviors grounded in myopic self-interests (Levinthal and March, 1993), spurred by hubris or reinforced through organizational practices, threaten achieving the organizational goals (Schein, 2010). Perhaps, given the different business models, teaching hospitals should seek to understand how the different business models can co-exist and how to develop symbiotic relationships rather than relationships characterized by competition and subjugation.

Business models could then become a way to describe what we do (i.e., the organizational narrative (Massa and Tucci, 2014)). A shared language would also highlight the differences among managers. If we learn why business models are constructed, this learning can be used to improve business model expertise and to understand the value of different business model configurations. The tacit understanding (Polanyi, 2009, Teece, 2010) would become explicit (Zott and Amit, 2010). This would support organizational sense-making (Ring and Rands, 1989) and contribute to better internal and external communication (Massa et al., 2017). If managers understand their own and others' organizational business models, they might better understand how to make improvement efforts or adapt to changing environments (Gioia et al., 2000, Bohmer and Edmondson, 2001), such as technological advances, disease panorama, demographics, or patient demands.

6.2.2 Same, same, but different

Within the same regional health care system, with the same reimbursement model and the same specialty, four different ways to deliver care was identified (i.e., the four business models) (Study IV). The perinatal organizations operated with different business models, which might indicate different ways of creating value, and explain differences in organizational performance, different sources of value creation and innovation (Hamel and Ruben, 2000, Amit and Zott, 2001, Weill et al., 2011).

The CCKs represented the traditional views of what health care should be – hospital-based, clinical, and with a focus on complicated cases. The NTs challenged tradition by viewing their staff and their patients in new ways. They used the staff's broad competencies in ways that exceeded their professional roles. They engaged staff in continuous innovation (Paulus et al., 2008). They recognized the usefulness of social media. They had a more cogent business model because its different elements interacted with each other more coherently. They were more adept at driving business model innovation through "designed, novel, nontrivial changes to the key elements of a firm's business model and/or the architecture linking these elements" (Foss and Saebi, 2017). In many respects, the newer NT was a further development, a sustained innovation, of the first NT (Christensen et al., 2009).

The LSP had a niche function that was evidenced by its assumption of the provider role and buffer that was capable of managing seasonal variations and that recognized its social responsibility. This was a business model that focused on a value proposition of delivering care through a physical channel in a local community. The LSP tailored care to this segment and demonstrated signs of close customer relationships (Treacy and Wiersema, 2007).

The Hybrid had been an NT but was then absorbed a CCK. This illustrates the challenge of running an innovative business model within a more traditional organization (Markides, 2013, Christensen, 2013). The Hybrid struggled to use its infrastructure resources innovatively, possibly because of CCK's cost containment focus. This provides further evidence of the challenges and complexity of trying to realize the possibilities of developing a business model within a business model (Markides, 2013).

The small-scale business models (NTs, LSP, and Hybrid) focused on creating a non-clinical environment characterized by care continuity. This focus created value for staff and customers that was not related to whether the organizations treated low-risk or high-risk patients, whether the organizations were freestanding, alongside-hospital, or hospital-based, or whether the organizations were privately owned or publicly owned.

These business models could also function as learning lines, or small-scale microsystems, in which experiences can contribute to organizational learning (Bohmer and Edmondson, 2001, Senge, 2006), clinical performance, and innovation (Batalden et al.). These small-scale learning system could also be a reflection of better strategies for coping with complexity (Braithwaite, 2018, Plsek and Wilson, 2001). Such contributions could be of benefit to the larger hospital-based CCK. The innovative development of the NTs, by which they moved away from traditional hospital business models and adopted new technologies, suggests that business model frameworks could support these new approaches as they have for the e-health approaches (identified in Study II) and in disruptive innovation (Christensen et al., 2009).

6.3 FINDING BALANCE ON THE FINANCIAL SEE-SAW

The cost element of VBHC was among the least-cited categories identified in the most-cited article (Study I). This finding may reflect the challenge in accurately capturing costs. A similar difficulty was identified in Studies III and IV, where both the hospital and perinatal business models struggled to balance the costs and revenues.

At the hospital (Study III), tension developed between the espoused value proposition (care delivery, education, and research) and the *de facto* value proposition (cost cutting and care production). This struggle likely relates to the managers' attempts to balance costs and revenues given the contractual agreements with the purchaser.

Still, the managers had limited understanding of the actual cost structure. Although opportunities existed to increase revenues (e.g., increasing patient inflows from outside the region or renegotiating purchaser contracts with the purchaser), the managers did not explore those opportunities. In fact, the departments' self-important attitude vis à vis the hospital's core value proposition seemed to influence their approach to balancing costs and revenues. In some instances, the established and accepted budgeting practices of the different departments may have contributed to a distortion of the hospital business model. Many of the managers were physicians. Their medical training and experience may have meant they exerted a "looser" managerial control agenda that allowed the professional dictate of "cure at all times" to steer their agenda (Glouberman and Mintzberg, 2001a).

In the perinatal setting (Study IV), there was limited interaction between the cost structure and the revenue stream. Managers focused on one or the other. The reimbursement contracts fed the revenue streams and also set restrictions on which patients to treat. Only the value proposition of the LSP was well matched with the customer segments per the contracts. It was, however, still a struggle. The large-scale and high expertise CCK organizations showed signs of the undifferentiated full-service hospital phenomenon of trying to do "everything" – to provide

highly specialized services for multifaceted conditions in addition to generalized health care (Corrigan and Mitchell, 2011, Christensen et al., 2009, Hwang and Christensen, 2008). These organizations did not, as expected, appear at an economic disadvantage compared to the innovative private NTs (Casalino et al., 2003, Guterman, 2006). In general, full-service hospitals have proportionally higher costs for administration, research, and education (Rauh et al., 2011). They are often low-volume, low predictability solution shops. This means care can result in substantial costs for shared resources that should be allocated along service lines (Schneider et al., 2008).

Nevertheless, the managers struggled because of their inadequate understanding of financial matters (Study III). Similar to the public CCKs, this shortcoming may be a reflection of the bureaucracy and weaker organizational commitment sometimes attributed to public managers (Boyne, 2002). Like managers in the NHS, the hospital managers in this study are compensated essentially irrespective of their performance (Health Committee, 2006). Possibly the explanation is that it would be politically embarrassing to close down the facility (Corrigan and Mitchell, 2011). This, in turn, means decisions are not always based on sound judgement (Walshe and Rundall, 2001, Brunsson, 1982).

6.4 FACILITATION OF CONVERSATIONS ABOUT HOW TO IMPROVE HEALTH CARE

Although strategy is not an element of the BMC, the analysis of intra- and inter- organizational business models could inform strategic decision making. The process of identifying the business model elements and describing the interconnections between them could facilitate conversations among stakeholders that lead to strategies that improve health care through better coordination and integration.

This is in line with complexity theory, which suggests that relationships between parts are more important than the parts themselves, and that health care should move towards a learning system. Systems-thinking should be applied that builds the momentum for change. This often requires an emergent approach that begins on a small scale, at the micro-level, where local organizational cultures and politics rule (Braithwaite, 2018, Plsek and Wilson, 2001, Bohmer, 2016). Without promoting a new management concept, business model analyses could be a way for organizations to become less reliant upon consultancy firms. This is especially important since recently, a positive relationship has even been identified between consulting expenditures and organizational inefficiency in a public health care setting (Kirkpatrick et al., 2018).

6.4.1 Business model framework usability

One example of how the business model could help facilitate discussions would be to examine the different elements. In Studies III and IV, patient choice was to a large extent based on geographic proximity, as described in the literature (Dixon et al., 2010). This finding may have implications related to how much organizations should be involved with some key activities (e.g., marketing activities for increasing patient inflow). Study III revealed a difference in

managers' views on marketing. Some managers with an emergency focus thought marketing was a pointless activity, whereas some managers with an elective focus thought marketing could be beneficial.

Another option of how the business model could help facilitate discussions is for an organization to choose the approach (from the six approaches) to business model frameworks identified in Study II that best matches its aims. While the element content of the business model frameworks describes what could be "captured" by its use, the six different approaches reflect how the business model frameworks have been applied. These approaches help identify more mature approaches to the analysis, development, and evaluation of business models. The comprehensiveness of these approaches may differ because all frameworks cannot be used for every purpose.

Among the development frameworks, examples of new, proposed frameworks were found that intended to capture "everything" by combining several different frameworks in one when developing business models (Meertens et al., 2011). This can become very complex and might even include different units of analysis, depending on the business model definition. This has implications for staying true to a definition and to facilitating transferability and realistic use within an organization.

The STOF model was used empirically by taking an action research approach (Huis in 't Veld et al., 2011), while more than one-fifth were process modeling tools interpreted as business models used to develop visualizations of processes. The applications of process modeling has been described in some of the earlier fields of business model applications tied to the Internet era (Wirtz et al., 2016). More recently, it has been argued that business process modeling is not business modeling. This argument suggests there is a shift from processes to value exchanges between actors (Gordijn et al., 2000).

6.4.2 Adapting terminology and re-conceptualizing stakeholders to improve fit with health care

Although some have cautioned for use of the BMC in settings other that profit generating ones (Bocken et al., 2014), this thesis did not attempt specifically to adopt a business model framework that might have been more suitable for the context. Still, the BMC can be considered useful for analyzing and comparing intra-organizational aspects of cognitive schema and inter-organizational aspects of organizations' attributes in publicly financed health care.

To comment on the usefulness of BMC, it is necessary to address two of its characteristics: its framework content and its visual configuration (see Table 7). These were acknowledged and addressed to varied extents in Study III and IV as described below. The advantages why the BMC was chosen as business model framework in this thesis were described in Chapter 3 (Methodology).

Table 7. Perceived advantages and disadvantages of using the BMC

	Advantages	**Limitations**
Framework content	• Value is central (creation, delivery, capture) • Organization-centric • Exemplified intra- and inter-organizational business model analyses • Flexibility and comprehensiveness in use, irrespective of setting	• Lack of acknowledgment of the dynamic environment by the elements • Little focus on value propositions linked to customer segments compared to key resources, key activities, channels, and customer relationships • Revenue stream and profit focus
Visual configuration	• Visual representation • Useful. Simple in its design for communicating business models	• No clear mechanisms among the elements

As with all frameworks, the element content of the BMC creates a certain world view as to the nature of a business model. The BMC is not a fully integrated framework because, for example, it lacks strategy and procurement components (Wirtz et al., 2016). A business model is not isolated; it is surrounded by a dynamically changing environment. Thus, the BMC does not address, for example, industry forces, market forces, macroeconomic forces, and key trends such as competition, switching costs, global economic conditions, and the PEST analysis (Political, Economic, Social, and Technological). However, an assumption in the research for this thesis was that a dynamic environment, especially in health care (Greenhalgh and Papoutsi, 2018), would appear in the analysis of business model elements and their interactions.

Shortcomings have also been identified related to the abstraction of the BMC elements (Kraaijenbrink, 2012). One is that the BMC has a disproportionate focus on the value creation of key activities and key resources, and on the value delivery mode of channels and customer relationships. Another is that the BMC has too little focus on the link between value propositions and customer segments (Kraaijenbrink, 2012). A third is that the value capture mechanism focuses only on the revenue streams that generate profit (Stanimirovic, 2015, Bocken et al., 2014).

In this thesis, value creation from key resources and activities was essential in both empirical studies (Studies III and IV). Although, the channel function of the BMC primarily can highlight innovative and new ways of delivering care, such as e-health solutions, this was important even for "more" traditional health care providers. Customer relationships were also important. Relationships were key in all interactions in the cases. In addition, elements were interpreted

broadly, in particular, the value propositions and the customer segments and their interrelationships. The question of profit was minimized since revenues less costs was not a calculation in focus. In addition, revenue streams and customers (patients) were somewhat static elements for the organizations since these to a large extent were negotiated and "agreed upon" in annual contractual agreements, which is an inherent characteristic of publicly financed health care.

Regarding visual configuration, the BMC lacks interconnections among its elements (Mettler, 2014). The problem of interconnections among elements might have arisen when the BMO, which was developed from a literature review on the intersection of information systems and strategic management (Osterwalder, 2004), was re-labeled as the BMC. At that point, the model was "oversimplified" as an entrepreneurial tool intended for use in the design of business models (Simonse, 2014). This lack of a visual configuration can ultimately lead to difficulties in defining the actual business model. There were some difficulties in describing element interactions, even though a modified BMC/BMO was used and summaries of business model narratives were written down to capture interconnections among elements. Therefore, using a more robust method to identify the interconnections among the elements and to describe the patterns of interactions that lead to a discernable business model could be worth developing. For future studies, however, it could be interesting to capture the managers' narratives, which might be the highest business model abstraction from reality (Massa and Tucci, 2014).

The contextual aspects of the social and environmental elements are probably appropriate considerations for the health care setting, in particular, in publicly financed health care. By adding other stakeholders to the BMC it may become more comprehensive (Bocken et al., 2013). One suggestion is to add two layers to the BMC that can develop sustainable businesses or activities: an environmental layer based on a lifecycle perspective and a social layer based on a stakeholder perspective (Joyce and Paquin, 2016). In addition, in social businesses or activities, profit is not always the ultimate aim, and "receivers" (i.e., patient) do not always (and may not be expected to) pay for services provided (Bocken et al., 2014). The payer (and ultimately the tax-paying public) pays the health care organization to fulfil its mission. That is also why third party-funded models or triple bottom line BMCs exist (Osterwalder and Pigneur, 2010). These two BMCs recognize that the service recipient is not the payer, and that social benefits, in addition to economic benefits, are important.

In order to facilitate conversations among health care professionals, the terminology used in the business model frameworks should be adapted to the health care context. One approach could be to harmonize the terminology and even the business models, linking them to each other. However, the six approaches suggest that this would be difficult, even with simplified applications and increased transferability in how the business model frameworks are used as research tools by health care organizations.

Another, probably more fruitful approach, would be to adapt the specific terminology and use it to facilitate discussions about how to re-conceptualize roles within the elements of the business model. This was a finding related to the patient, purchaser, other hospital departments, relatives of patients, and staff. Two of these findings about roles are worth discussing further.

6.4.2.1 Patient role

The managers (Studies III and IV) and the head midwives (Study IV) placed patients at the center of care. Patients were their most important customer segment. However, most interviewees reflected upon the ambiguous, almost taboo, terminology used to address patients as customers. This issue may reflect the idea that patients are almost non-paying customers in publicly financed health care. Yet the idea of the patient as a customer, if used constructively, could provide important insights when BMC is implemented in clinical practice. Some business model elements perhaps should be redefined to reduce the risk of superficial and incomplete applications (Taylor et al., 2013, Mazzocato et al., 2010).

The conversation about customer identity can lead to new ways of working if the customer is seen as a consumer or a partner. Thus, it might be worthwhile to consider replacing the term "customer" with "consumer" or even "prosumer", especially in a publicly financed health care context. There is value in exploring the elements and their interactions such that this conversation can lead to the beneficial development of care. Re-conceptualizing the patient as a key partner and a customer means that it is possible to engage patients in creating the services they themselves consume, either in a facilitated user network or as prosumers (Tapscott and Williams, 2008, Christensen et al., 2009).

6.4.2.2 Purchaser role

The patient is not the only stakeholder whose role might be better re-conceptualized with positive consequences for the organizational business model. By re-conceptualizing the purchaser as a key partner, health care organizations and purchasers would more likely have the same interests at heart – high-quality health care. Negotiating shared interests through participatory practices, such as budgeting and development of performance indicators, could have important ramifications (and challenges) for both the purchaser organization and the healthcare provider (Shortell and Addicott, 2016).

This idea appeared in the managers' view of the purchaser. If the managers see purchasers as customers, their relationship with the purchasers may become adversarial and too detail-focused. The result is to impede attainment of the value proposition when, for example, volume is prioritized over quality. In their current relationship with the purchaser, the managers realized it was difficult to exploit existing capabilities and to explore new opportunities – both are essential for the improvement and innovation of the business model (Markides, 2013). Potential gains in care production were hampered by roles defined by a relationship predicated on the annual negotiation of production volumes. These are macro-level regulatory constraints (Saltman et al., 2011).

6.5 SYNERGIES BETWEEN BUSINESS MODELS AND VBHC

Defining an organizational business model may create conditions in which it is easier to identify how VBHC strategies, or other management concepts, could be implemented in

organizations. And VBHC, could contribute a clearer strategy perspective for business model analyses.

Study III and Study IV revealed there might be various interests in capturing value (i.e., revenues, from a traditional economic sense). Therefore, the value equation of VBHC could support managers who struggle to understand how costs and revenues can be balanced.

For health care organizations, a focus on value creation aspects (predominantly internal elements – key resources and activities - and key partners) might be the most common way for managers/health care organizations to facilitate business model innovation. Perinatal care, in particular at the NTs, exemplified this where explicit business model element connections could contribute and support business model innovation. This could occur by highlighting previously hidden opportunities for value creation via identifying new ways of connecting operations (Christensen et al., 2009). Value creation is especially important for its acknowledgement that employees should be an organizational priority if they are to *deliver* high-quality care (Bodenheimer and Sinsky, 2014).

Value delivery aspects are important in many e-health applications where innovative channels unlock high performing innovations (Meertens et al., 2011). What is delivered to different customers segments, may not apply to the traditional customer segments but could contribute to greater societal value (Wass and Vimarlund, 2016), a goal worth striving for.

6.6 METHODOLOGICAL CONSIDERATIONS

In this section, philosophical assumptions are considered in terms of their influence on the research designs, methodology, data collection, and analysis, with additional reflections on research trustworthiness. These considerations are in line with the standards for reporting qualitative research (SRQR) (O'Brien et al., 2014).

6.6.1 Philosophical assumptions

Philosophy entails abstract ideas and beliefs that can inform and guide research (Denzin and Lincoln, 2011). Theoretical paradigms correspond to the shared lenses scientists use to view and understand the world and its problems (Kuhn, 1970). In this thesis, I have attempted to make these philosophical assumptions explicit in terms of epistemology, ontology, axiology, and methodology (Lincoln et al., 2011, Guba, 1990).

Generally, in medical research hypotheses or propositions based on *a priori* theory are tested using experiments and observations. To a large extent, this world view can be regarded as post-positivistic, which is a looser perspective on the cause and effect of positivism. A social constructivistic or interpretivistic view does not begin with a theory: rather, such views inductively try to generate theories (Denzin and Lincoln, 2011). This is more appropriate in the social world, which is often unpredictable, such as in the complex social environments of health care. Such an environment is unlikely to react the same way every time, in contrast to the laboratory experiment conducted under controlled conditions.

Post-positivism traditionally uses quantitative data, whereas social constructivism tends to use qualitative data. A mixed-methods research approach that combines quantitative and qualitative data is one way to enlarge social science and health service research by minimizing the division between the qualitative and quantitative paradigms (Creswell and Clark, 2007). It is an attempt to integrate "the best of two worlds". Giddings (2006) has labelled this effort "post-positivism dressed in drag".

This thesis generally takes a pragmatic position (Patton, 1990) in that no commitment is made to any particular system of reality or philosophy. From an epistemological point of view (i.e., what counts as knowledge), reality is depicted through the use multiple research tools that can reflect both deductive and inductive evidence. Ontologically, the nature of reality is regarded in terms of what is useful and practical. Axiological beliefs – the role of values – are acknowledged, which means that biases are present. In this thesis, the biases are mine, those of my co-researchers, and those of the studies' participants.

This thesis does not argue for any particular method of data collection or analysis. Instead, because the aim of this thesis is to find answers to the research questions, any method of data or data analysis is valid it if "works" by providing those answers (Patton, 1990). Hence, methodologically, the chosen approaches to inquiry involve both quantitative data (Study I) and qualitative data (Studies I-IV).

A pragmatic position was taken in making the methodological choices of interviews, observations, and documents, which were then analyzed using business model theory in terms of the BMC. The use of this pragmatic position was not always easy nor simple because as research objects, health care organizations can be likened to moving targets – data from the study of such targets are never complete or perfect. Thus, research designs for health care organizations can be complex because, for example, situations, personnel, and policies change. Such research should be approached in as open and transparent a way as possible with full recognition given to the many inter-relationships and tensions (Greenhalgh and Papoutsi, 2018)

6.6.1 Trustworthiness

The trustworthiness of research must be evaluated on the basis of how the methodology used generated the findings (Graneheim and Lundman, 2004). Traditionally, the trustworthiness of research conducted using the quantitative method or the qualitative method is described differently. In quantitative research, trustworthiness is often described in terms of validity, reliability, and generalizability. Some researchers suggest that validity and reliability have the same meaning (Long and Johnson, 2000). In addition, specific measures to assess methodological rigor in case studies exist – internal validity, construct validity, external validity, and reliability (Yin, 2013). In qualitative research, trustworthiness is often described in terms of credibility, confirmability, dependability, and transferability (Lincoln and Guba, 1985). These four characteristics are used to frame the examination of the trustworthiness of the four studies in this thesis.

6.6.1.1 Credibility

Credibility (or internal validity) addresses the choices made to assure trustworthiness in the data representation (Lincoln and Guba, 1985). To be credible, research should use the most appropriate method of data collection. Study I was an outcome of a study design in which the methods emerged during the research process (Klassen et al., 2012). It was assumed that the most-cited article is a seminal article in a research area. However, it is possible to challenge this assumption. For example, a qualitative analysis of published research on VBHC could have been a better way to reveal which article/s had the most influence. Such an analysis might have improved the probability of finding articles written at higher levels of understanding.

In addition, full-text analyses of the articles were limited to the empirical articles. As a result, an understanding of the most-cited article may have been incomplete since developments of the VBHC concept could exist over the course of the article, which was not assessed by looking at cited text in immediate proximity to the cited text of the seminal article. For example, an article with an extension of the three-tiered model to chronic care was included in our analysis (Porter et al., 2013), which could be interpreted as SOLO 4. However, the article was presented as a new model rather than as the development of a model.

In Study II, a quality appraisal, which is common in systematic reviews, was not conducted. This is less relevant in qualitative analyses, particularly in management and organizational reviews because they often use a wide range of methodologies. Assessing quality based on study design may hamper the identification of some relevant findings (Briner and Denyer, 2012). Pharma and biotech applications, which might have included more mature business model thinking, were excluded from the study.

It is debatable whether the framework as the intervention and the approach as the mechanism are appropriate choices in an attempt to translate CIMO-configurations to CAFO-configurations. At issue is whether the frameworks were assessed based on how they were applied to, or in, organizations. The CAFOs were used more to guide and highlight relationships than to develop explanations in terms of program theories (Pawson and Tilley, 1997).

To ensure credibility, purposive sampling, triangulation, and member checks were used (Lincoln and Guba, 1985). Various types of sampling techniques exist such as convenience, theoretical, selective, and purposive techniques (Creswell et al., 2011). For the two empirical studies (Study III and Study IV), purposive sampling and total sampling were used (see Chapter 4) to identify cases and interviewees (Robinson, 2014, Klassen et al., 2012). Triangulation, which is a hallmark of case studies, was used in Study IV to combine multiple perspectives and to develop a more complete picture by crosschecking the data consistency among the different empirical sources (Miles and Huberman, 1994). This was especially important because "only" eleven interviews were conducted, which could be interpreted as rather few in a multiple case study of eight clinics. Certain constraints combined to limit the number of interviews that could be conducted, such as the merger of Clinic D into Clinic E during the data collection period.

To counter this, representatives from all perinatal clinics provided respondent validation (Yin, 2013) although it is recognized that this processes of ensuring credibility can be biased (Elo et al., 2014).

Another way to ensure credibility of research is to use more than one coder to independently analyze all data. This practice, which increases intercoder reliability, was used in all four studies. Although this was not always possible in the later analytical stages of Studies II, III, and IV when identifying patterns among the CAFO-configurations, the hospital, and the four perinatal business models. Instead, this process was conducted rather more iteratively and inductively by the co-authors in collaboration.

Pre-interviews were conducted to determine if the interview questions were relevant and comprehensible. The interview guides (Studies III and IV) were not entirely focused on business model elements. Since the deductive content analysis approach was used for these two studies, pre-testing the categorization matrix was conducted – as recommended (Schreier, 2012) – by piloting the BMC elements. A "codebook" was also introduced to secure harmonization of the independent coding (which was conducted by two or more researchers) and to facilitate discussions on the difficulties of using the BMC coding matrix (Elo et al., 2014).

The goal of a directed content analysis approach is often to validate or conceptually extend a theoretical framework. This allows existing theory to be supported or extended (Hsieh and Shannon, 2005, Elo and Kyngäs, 2008). Although the goal of the research in this thesis was not to validate the BMC, the analysis achieved a similar role. Coding was conducted using the predetermined codes (BMC elements), which corresponded to a structured categorization matrix (Patton, 1990, Sandelowski, 1995). Any text that could not be categorized using the initial coding scheme was not assigned a new code (Hsieh and Shannon, 2005). However, subcategories within the element codes were identified inductively (e.g., differently tailored value propositions were grouped under care delivery, education, and research, or as key activities tied to management or development). In addition, the categorization of similarities and differences was inductively identified beyond the BMC. These sub-categories and the inductively identified similarities and differences were not an attempt to present the BMC as a theoretical framework.

6.6.1.2 Confirmability

Confirmability (or objectivity) refers to the neutrality of research. It is a measure of whether the data are accurate, relevant, and free of researcher bias (Lincoln and Guba, 1985).

The directed content analysis is characterized by a more structured process than conventional content analysis (Hickey and Kipping, 1996). For example, key activities and resources were found to be of utmost important to the context of in this research. However, the BMC's value creation focus might have led to the conclusion that key activities and resources were relatively more important compared to other elements. Irrespective if true or not, the pragmatic stance of this thesis raises no objection but might have been the case to a social constructivistic paradigm since the researcher tries to find evidence that supports a theory (Lincoln and Guba, 1985).

Reflexivity, plus following an audit trail, can support confirmability of research and can justify the decisions taken during the research process. Although I did not keep a reflexive journal that documented my values in the research process, I discussed the research process with my peers and took detailed notes at meetings. I also recorded my impressions during the coding process.

6.6.1.3 Dependability

Dependability (or reliability) refers to the consistency of the research; that is, whether the research is repeatable (Lincoln and Guba, 1985). For this research, a study design and case protocols were developed. Detailed descriptions of the methods strengthened the dependability of the four studies. However, some iterative inductive processes might be difficult to reproduce.

The boundaries between thematic analysis and content analysis are not always clear (Vaismoradi et al., 2013). In Study I, the method used was thematic analysis (Braun and Clarke, 2006). However, content analysis (Elo and Kyngäs, 2008) might have been a more accurate description given that categories were used to guide the analysis. The use of categories for the textual data led to the creation of a nominal scale that facilitated the frequency counts (Braun and Clarke, 2006). In addition, the categories, which were mutually exclusive, reflected descriptive content and therefore might better correspond to the manifest and explicit nature of the data. By contrast, abstract themes, which correspond more to the latent content between the lines, may merely capture some relevancy in the data related only to the research question (Graneheim and Lundman, 2004, Potter and Levine-Donnerstein, 1999).

In Study II, the search strategy did not identify some articles that possibly should have been identified. One example is an article by Cook et al. (2014) that describes common business model typologies – solution shops and value-adding processes. Because the term "business model" was not in the article, the search strategy did not identify it.

A clear description of the content analysis process was attempted (Studies III and IV). However, repeatability can be difficult in qualitative research environments that are dynamic where current mangers can be replaced by new managers with different views and where new organizational change initiatives can be adopted. In addition, health care organizational business models also exist in a dynamic environment. Business model frameworks should take this fact into consideration (Bouwman et al., 2008, Kijl et al., 2005).

In this research, an assumption was that the BMC elements could capture the dynamism of the environment even when such elements were not evident (as discussed in section 5.8.2). By repeating the business model analyses with the BMC comparisons of the dynamic environments of different business models could identify generic patterns in the cycles over time (Bouwman et al., 2008). In the studies, "snapshots" of the dynamic environments at the hospital (Study III) and at the perinatal clinics (Study IV) illustrated the business models. In the perinatal context, the conditions did not permit sequential data collection. This means that the idea of an action research project was unexplored. Such a project certainly could contribute to a deeper and more dynamic exploration of the business models (Huis in 't Veld et al., 2011).

6.6.1.4 Transferability

Transferability (i.e., generalizability or external validity) applies to the applicability of the research to other contexts (Lincoln and Guba, 1985).

Study I does not attempt to claim its findings are transferable. However, with some minor methodology modifications, other management concepts in health care and elsewhere might benefit by following the methodology used in this study.

In Study II, abstracted summaries of the CAFO-patterns were used to reduce the results to heuristics (Briner and Denyer, 2012) and thereby to increase the transferability of the results. The CAFO-patterns can be used as a practical guide to how business model frameworks have been applied in health care. These patterns may also be of value in identifying generalizable patterns of the various business model functions (Massa et al., 2017).

Study III corresponds to a *typical* case (Patton, 1990) of a publicly owned and operated, university affiliated acute general hospital. However, the case examined in this study does not correspond to all public health care settings, which may differ significantly (Saltman, 2018). Nor does the case correspond to all hospitals (such as community, specialist or university hospitals) although tertiary care hospitals and acute general hospitals can be similar (Harrison, 2011).

In Study IV, business models were not classified based on pre-defined typologies or on a single business model design. The models were inductively compared following the exploratory multiple case study design. Our four typologies are not generalizable in the same way that Stabell and Fjeldstad (1998) generalize about solution shops, value adding processes, and facilitated user networks. These typologies have been used theoretically (Hwang and Christensen, 2008) and practically (Cook et al., 2014). This means that further investigation is needed in other perinatal and health care contexts, especially because the Stockholm health care system has some unique characteristics. Only then can generalizations be drawn with literal or theoretical replications logics if similar or contrasting results are predicted, respectively (Yin, 2013).

Furthermore, the hospital management and perinatal clinic management correspond to the meso-levels (Studies III and IV) and to the micro-level (Study IV) of decision-making (Saltman et al., 2011). Additional perspectives might have revealed additional important business model perspectives. Again, caution is advised when claiming transferability. Nevertheless, other data sources complemented the results in Study IV. In the end, it is the reader who determines transferability by deciding which of the findings are useful to them (Gummesson, 2000).

7 CONCLUSIONS

VBHC and business model frameworks are commonly and increasingly used to improve value in health care. Because VBHC is understood at a superficial level (Study I), there is a risk that it will be abandoned before the return on the investment needed to improve value can be realized. In a similar fashion, the use of business model frameworks in health care are characterized by ambiguity and seldom incorporate empirical data (Study II). The empirical applications of the BMC in this thesis suggest that there can be multiple, co-existing business models within the same organization (Study III) or within the same health care system (Study IV). Thus, a business model analysis can provide the basis for more proactive discussions among stakeholders about how health care organizations or systems want to, should, and could approach how they create, deliver, and capture value. For example, proactive discussions between managers and policy makers (purchasers) of the financial aspects of business models and VBHC could be facilitated through business model analysis that counteracts the helplessness expressed by many managers today.

The superficial understanding of VBHC and business models in health care makes it difficult for managers to develop effective and sustainable improvement strategies that create, deliver, and capture value. If managers and researchers understand how the nine elements of the BMC are interconnected, they may better visualize how financial viability, the customer interface and infrastructure management are connected with the services delivered. This understanding may have a positive effect on their ability to contain costs and still provide high-quality patient care and positive employee work conditions.

7.1 IMPLICATIONS

Regardless of whether one is a policy maker, a manager, a researcher, or a practitioner, it is worth taking the time to developing a deeper understanding of VBHC while action is still possible. This is probably preferable to searching for the next management panacea.

In the pursuit of value, managers could use the business model analysis as a way to increase their awareness of how value is created, delivered, and captured in organization(s) today. They could strengthen the interconnections among the business model elements by focusing on those elements that are more aligned with the value proposition. Therefore, it is essential to define and reevaluate the value proposition.

There are potential synergies between business model analyses and VBHC. Defining the business model could make it easier to identify how VBHC strategies can be implemented. The value equation could support managers who struggle to understand how costs and revenues can be balanced. The business model analysis could also be used to capture current and future conditions for health care organizations by creating application opportunities for other management concepts, such as Lean.

A business model analysis could help health care organizations meet society's demands by reconceptualizing the role of stakeholders, such as the patients, staff, and purchasers.

7.2 FUTURE RESEARCH

Future research should address the possible effects of managers' conceptualizations of different business models that are found at the overall hospital level and the hospital department levels. Because these models may well differ, it is worthwhile investigating how managers understand them. Such research could provide a more nuanced understanding of the strengths and limitations of efforts to improve total organization alignment, particularly with respect to health care outcomes, patient experiences, and financial costs.

Business models can be further developed for application in health care by expanded methodological approaches. These approaches might integrate quantitative data (e.g., financial statistics, annual reports, key figures) with qualitative data (e.g., interviews, observations, narratives). More experimental and experiential evidence should be gathered that can illuminate the value of business models and implementation of VBHC. How should business model elements possibly differ and be better adapted for a health care context? Should they differ in terms of sustainability and quality? And, how do health care professions communicate and conceptualize what they do as they create, delivery, and capture value?

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10 APPENDIX

10.1 APPENDIX A: DETAILS ON SEARCH STRATEGY AND STUDY SELECTION (STUDY II)

Literature Search and Information Sources

Our search strategy was designed to find all studies (peer-reviewed and non-peer-reviewed literature) in the two largest medical databases, PubMed and Web of Science, and academic journals in EBSCO's Business Source Premier (BSP) database, one of the most extensive collection of business studies. We searched the databases from January 1, 1975, through August 10, 2015. For PubMed, we used the medical subject heading (MeSH) "Health Care Category" combined with "business model*. This resulted in the following search strategy:

"Health Care Category"[MeSH] AND (business model [All Fields] OR business modeling [All Fields] OR business modelling [All Fields] OR business models [All Fields]).

Since it is recommended that subject searches are complemented with text word searches,(Jenuwine and Floyd, 2004) we performed an additional search where we coupled the term "business model*" with one of the following: hospital, healthcare, or care. The strategy used was:

(business model[All Fields] OR business modeling[All Fields] OR business modelling[All Fields] OR business models[All Fields]) AND (("hospitals"[MeSH Terms] OR "hospitals"[All Fields] OR "hospital"[All Fields]) OR care[All Fields] OR ("delivery of health care"[MeSH Terms] OR ("delivery"[All Fields] AND "health"[All Fields] AND "care"[All Fields]) OR "delivery of health care"[All Fields] OR "healthcare"[All Fields])).

This latter search strategy was also applied to the Web of Science and BSP searches using the following strategy: (("business model*") AND (hospital OR healthcare OR care)).

Study Selection and Data Collection Process

Four inclusion criteria were used to select the studies:

"Business model*" in abstract, title or keywords

Settings describing health care services, organizations, systems, or actors and partners in the health care system

Published in English

A discernable framework explicitly related to the term "business model". We used the Meriam Webster definition of a framework: "The basic structure of something: a) a set of ideas or facts that provide support for something; b) a supporting structure: a structural frame". This criterion was motivated by the fact that we were looking for tangible applications of business model thinking.

Eligibility was determined in two steps. The first author screened the title, abstract and keywords of all studies according to inclusion criteria 1-3. JJF and RM independently performed full-text analyses of the articles (inclusion criteria 4). Discrepancies were resolved through consensus or discussions with either PM or CS. To check reliability, two randomly selected samples (consisting of 50 studies each) were independently reviewed by PM and CS. Minor inconsistencies (less than 5%) were found, analyzed, discussed, and corrected after consensus was reached. Similar cases were then reviewed to ensure that all relevant articles were included.

Data Items and Data Synthesis

We developed and pilot-tested a data extraction form through several iterations to ensure a comprehensive level of detail. General information about the study was extracted including: authors, year of publication, journal, title, type of citation (e.g. peer-reviewed or non-peer-reviewed articles, i.e. proceedings, magazines, book chapters), country, type of framework, and if the study was empirical or theoretical.

Context, Approach, Framework and Outcome (CAFO) data for each study was independently extracted and organized in MS Excel by JJF and RM. These were then compared and aggregated to ensure that no vital data was overlooked. CAFO-configurations were then constructed by JJF and RM together for each article and then compared and grouped into categories iteratively. JJF, RM, CS and PM thematically analyzed the CAFO-configurations in each category in order to discern and capture patterns and identify sub-categories. Each category or sub-category was then summarized with a new generalized CAFO-configuration. Together, all authors then exhaustively reviewed and revised the categorization of the articles, the category headings, and the configuration summaries. Individual articles were consulted when questions arose. The generalized CAFO-configurations for each category were then compared and through an iterative process of reflection, discussion, and hypothesis testing against the data, preliminary theories were constructed to describe business model thinking in health care.

10.2 APPENDIX B: INTERVIEW GUIDE (STUDY III)

Kartläggning av sjukhusets affärsmodell

INTRODUKTION

Tack för att du tar dig tid och ställer upp i denna intervju.

På begäran av [redacted] genomför vi intervjuer med samtliga i sjukhusets ledningsgrupp. Målet med denna intervju är att få en ökad förståelse för hur just sjukhuset organiserar sig samt leds för att bättre skapa, leverera och tillfångata värde i sin verksamhet och sitt strategiarbete.

Det övergripande syftet med projektet är att få ökad förståelse för universitetssjukhus' verksamhet och strategier i tider då det ställs stora krav på förändring av hälso- och sjukvården.

Vår analys av dessa intervjuer kommer sedan att återföras till er. Resultaten kommer även att utgöra en del av mitt avhandlingsarbete på Medical Management Centrum på KI.

Intervjun kommer att ta ca 60 minuter. Deltagandet är frivilligt. Du kan närsomhelst välja att avbryta intervjun. All data kommer att behandlas konfidentiellt. Deltagandet i intervjun är anonymt på det sättet att du inte kommer nämnas vid namn i något producerat dokument, endast vår forskargrupp på MMC kommer ha tillgång till intervjumaterialet. Vi kommer att skicka dig ett utkast av vår case-beskrivning för att du ska kunna läsa igenom det materialet som kan komma att inkluderas i vårt arbete.

Om du har några frågor kan du kontakta mig (jensjacob.fredriksson@ki.se), Pamela Mazzocato (pamela.mazzocato@ki.se) eller Carl Savage (carl.savage@ki.se) på Medical Management Centre, Karolinska Institutet.

För att underlätta analysarbetet kommer intervjun att spelas in. Är det ok för dig?

Då sätter jag igång inspelningen. Och då ska jag upprepa frågan, är det ok att vi spelar in?

FRÅGOR

Inledning

1. Skulle du kort kunna beskriva din roll och ditt uppdrag i organisationen och vilket/vilka verksamhetsområden du ansvarar för?
    a. Antal medarbetare och underställda chefer?
    b. Chef/chefläkare hur länge/Hur länge har du arbetat i denna verksamhet?
    c. Vad är du ursprungligen utbildad till?

Tack. Nu tar vi nästa fråga.

Mission, verksamhetsmål och ledning

2. I dina ord, vad skulle du säga att din organisation gör? (fånga sjukhuset i stort)
    a. Hur speglas det ni gör i er mission och era verksamhetsmål?
    b. Hur speglas verksamhetsmålen i det dagliga arbetet på sjukhuset?
3. Vilken uppföljning sker av den vård som ni bedriver? (Landstinget, sjukhuset och verksamheten)
    a. Vad mäter ni?
        i. T ex. aktiviteter, resursanvändning/kostnader, medicinska utfall?
    b. Hur mäter ni?
    c. Hur speglar det ni mäter era verksamhetsmål?

Sammanfatta

4. Hur skulle du beskriva att ni idag arbetar med att förbättra sjukhusets verksamheter?
5. Hur ser du på din roll i det arbetet?
6. Vad tror du krävs av dig och dina underställda chefer för att leda förbättringsarbetet på ett bra/bättre sätt?
7. Vad tror du krävs av din chef för att leda förbättringsarbetet på ett bra sätt?
8. Inledningsvis nämnde jag de förväntningar och krav som finns på sjukvården att lyckas höja vårdkvaliteten samtidigt som kostnaderna inte kan fortsätta att öka; hur påverkar det sjukhuset?
9. Har det någon påverkan på hur ni arbetar med förbättringar på sjukhuset? Varför? (Behov? Måste reorganisera? Externt? Intern? Politik?)
10. Det pågår en strukturomvandling av hälso- och sjukvården i regionen. Hur påverkar detta sjukhuset?
11. Om du hade/sjukhuset obegränsat med pengar, vad hade du/ni gjort annorlunda?

Sammanfatta

Nu tänker vi ställa några mer ingående frågor om sjukhusets verksamhet

Affärsmodellens komponenter

12. Inom management brukar man prata om kunder. Vilka skulle du säga är sjukhusets kunder?
    a. Sammanfatta och ge namn till de olika kundsegmenten.
    b. *Vilka anser du är de viktigaste?*
    c. Kundsegment patient: Varför väljer dessa att vända sig hit och inte någon annanstans? (Hur får patienterna information om er verksamhet?)

13. Hur upprätthåller ni kontakt med era olika kundsegment? (långsiktigt? kortsiktigt? Kallelser?)
    a. Finns det andra kundsegment/patientgrupper som idag inte söker sig till sjukhuset, men som ni i framtiden skulle kunna locka hit? Hur?
14. Vilka är de viktigaste resurserna/tillgångarna som används för att ta hand om de olika kundsegment du har nämnt [ta var för sig]?
15. Vem samverkar sjukhuset med för att upprätthålla sin verksamhet?
    a. Finns det andra som du tycker det vore bra att samarbeta med? Varför?
16. Vilka utgör sjukhusets största kostnader? (fasta? rörliga?)
17. Vad har ni för intäkter?
18. Hur påverkar dagens ersättningssystem hur sjukhusverksamheten är organiserad och vården bedrivs? (exemplifiera)
    a. Är det några specifika kundsegment/patientgrupper som premieras respektive inte premieras av dagens styrsystem? (exemplifiera)

Sammanfattning av affärsmodellens komponenter

19. Utifrån denna sammanfattning, vad anser du är det viktigaste att förbättra?
    a. Inom sjukhusets verksamhet?
    b. Externt, som inte ni direkt råder över? (Barriärer, styrning, ersättningssystem)

Avslutande frågor

Om vi tar en stund att tänka igenom de frågor vi har nu diskuterat kring det värdet som sjukhuset skapar för sina olika ”kunderna” och hur det görs,

20. Finns det något mer du vill tillägga?
21. Avslutningsvis, finns det några dokument som du anser vara av stor vikt för att öka vår förståelse kring det vi just diskuterat gällande sjukhusets verksamhet och strategi?

Tack för att du svarade på våra frågor.

10.3 APPENDIX C: INTERVIEW GUIDE (STUDY IV)

INTRODUKTION

Tack för att du tar dig tid och ställer upp i denna intervju.

Vi arbetar på Medical Management Centre (MMC), där vi forskar på innovativa sätt att organisera och utveckla hälso-och sjukvården.

Vi intervjuar samtliga klinikchefer för Stockholms förlossningskliniker för att ta reda på hur starten av en ny förlossningsklinik kan ha påverkat förlossningsvården i Stockholm. Ni kommer att kunna ta del av det färdiga resultatet. Resultaten kommer att vara en del av vår masteruppsats och kan komma att publiceras i framtida vetenskapliga artiklar.

Intervjun kommer att ta cirka sextio minuter. Intervjufrågorna är indelade i 4 huvudområden: några inledande frågor om dig själv, frågor om verksamheten, hur uppföljning och styrning ser ut idag, och hur du skulle önska att verksamheten utvecklades och vad som krävs för att nå dit.

Deltagandet är frivilligt. Du kan när som helst välja att avbryta intervjun. All data kommer att behandlas konfidentiellt. Deltagandet i intervjun är anonymt på så vis att du inte kommer att nämnas vid namn i något producerat dokument. Bara vår forskargrupp på Karolinska Institutet kommer att ha tillgång till intervjumaterialet. Vi kommer att skicka dig ett utkast av vår case-beskrivning för att du ska kunna läsa igenom det materialet som kan komma att inkluderas i vårt arbete.

Om du har några frågor kring studien kan du kontakta oss, Pamela Mazzocato (pamela.mazzocato@ki.se) eller Carl Savage (carl.savage@ki.se) på Medical Management Centre, Karolinska Institutet.

För att underlätta analysarbetet kommer intervjun att spelas in. Är det OK för dig?

Då sätter jag igång inspelningen. Och då ska jag upprepa frågan: Är det OK att vi spelar in den här intervjun?

FRÅGOR

Inledning

1. Skulle du kort kunna beskriva din funktion och ditt uppdrag i organisationen?
    a. Antal medarbetare och underställda chefer?
    b. Hur länge har du arbetat i den här verksamheten?
    c. Vad är du ursprungligen utbildad till?

Tack. Nu tar vi nästa fråga

Mission, verksamhetsmål och ledning

2. I dina ord, vad skulle du säga att din organisation gör (vilka tjänster erbjuder ni till stockholmarna)?
    a. Hur speglas det ni gör i er mission och era verksamhetsmål?
    b. Hur speglas verksamhetsmålen i det dagliga arbetet på kliniken?
    c. Vad skiljer er från de andra förlossningsklinikerna i Stockholm?

3. Vilken kvalitetsuppföljning sker av den vård som ni bedriver? (Landstinget (SLL), sjukhuset och verksamheten)
    a. Vad mäter ni?
        i. T ex. aktiviteter, resursanvändning/kostnader, medicinska utfall?
    b. Hur mäter ni?
    c. Hur speglar det ni mäter era verksamhetsmål?

Sammanfatta

Affärsmodellens komponenter

22. Inom management brukar man prata om kunder. Vilka skulle du säga är klinikens kunder?

    a. Sammanfatta och ge namn till de olika kundsegmenten.

    b. *Vilka anser du är de viktigaste?*

    c. Kundsegment patient: Varför väljer dessa att vända sig hit och inte någon annanstans? (Hur får patienterna information om er verksamhet?)

23. Hur upprätthåller ni kontakt med era olika kundsegment? (långsiktigt? kortsiktigt? kallelser?)

    a. Finns det andra kundsegment/patientgrupper som idag inte söker sig till kliniken, men som ni i framtiden skulle kunna locka hit? Hur?

24. Vilka är de viktigaste resurserna/tillgångarna som används för att ta hand om de olika kundsegment du har nämnt [ta var för sig]?

25. Samverkar kliniken med några andra aktörer eller organisationer i verksamheten? Vilka?

    a. Finns det andra aktörer eller organisationer som du tycker det vore bra att samarbeta med? Varför?

26. Vilka utgör klinikens största kostnader? (fasta? rörliga?)

27. Vad har ni för intäkter?

28. Har etableringen av den nya förlossningskliniken haft någon inverkan på er

verksamhet? Vilken?

Sammanfattning av affärsmodellens komponenter

29. Utifrån de områden som vi har pratat om hittills, vad anser du är viktigast att förbättra?
    a. Inom klinikens verksamhet?
    b. Externt, som inte ni direkt råder över? (Barriärer, styrning, ersättningssystem)

Avslutande frågor

Om vi tar en stund att tänka igenom de frågor vi har nu diskuterat kring det värdet som sjukhuset skapar för sina olika ”kunderna” och hur det görs,

30. Finns det något mer du vill tillägga?
31. Avslutningsvis, finns det några dokument som du tycker är relevanta att läsa för att öka vår förståelse kring det vi just diskuterat gällande sjukhusets verksamhet och strategi?

Tack för att du svarade på våra frågor.

10.4 APPENDIX D: EXAMPLES OF CITING TEXT ACCORDING TO SOLO-LEVEL (STUDY I)

SOLO-level	Illustrative examples of citing text*	
0: Prestructural	Understanding patient attitudes to, and preferences for, treatment of chronic conditions is therefore crucial for optimizing healthcare strategies. [5*] (Bakhai et al., 2013)	Currently, the costs of carbon emission seem set to rise, [5] and a switch away from hydrofluorocarbon inhalers will require alternative delivery devices to show that they are, in the broad sense, better value. [6*] (Hillman et al., 2013)
1: Unistructural	Increasing awareness that the value of health care services is most appropriately determined from the perspective of the individual patient. [3*] (Neuman, 2011)	Porter has further proposed a framework for determining value. [6*] (Sachdeva, 2013)
2: Multistructural	Because it addresses a vexing clinical problem, venous thromboembolism (VTE), and because it speaks to the value (health outcome divided by cost [1*]) of the services that we provide. (Shackford and Rogers, 2011)	Outcome studies of genetic counseling can provide evidence of the value of genetic counselors (GCs). Value in health care, defined as health outcomes achieved per dollar spent, benefits patients, payers, and providers by providing the best patient care while maintaining cost efficiency. [1*] (Rutherford et al., 2014)
3: Relational	Process measures are easier to influence, whereas outcome measures are more 'meaningful' clinically. The latter are also more susceptible to case-mix variation, care processes outside the direct control of the QI team and to variation in how the case mix is coded.10,13–15*, 16 (Tomson and van der Veer, 2013)	Value in health care has been defined as health outcomes achieved per dollar spent. [16*] Determining what is high-value cardiac imaging requires measurable outcomes that are specific to a given condition. Outcomes, in the numerator, must be achieved efficiently; that is, the total cost of care for the condition must be calculated, and not merely the cost of an individual service. A more expensive test that reduces the overall cost of care may be a good investment of health care dollars. Diagnostic studies do not by themselves cure or change outcomes. Yet high-value imaging, by being performed in the correct part of the care cycle, conceptually can reduce the overall cost of care if it leads to a better health outcome. (Wiener, 2014)
4: Extended abstract	-	-

10.5 APPENDIX E: CAFO-CONFIGURATIONS ACCORDING TO APPROACH (STUDY II)

The context, framework and outcome for each of the six approaches are presented with references.

1. Business Model Description

Nineteen articles used frameworks to describe elements particular to a specific business model.(1-19) The frameworks were conceptualized in the context of collaborative boundary-spanning networks in health care systems,(1,3,5,13,17,19) e-health,(2,4,11,15,18) biopharma,(7) orthopedic care,(9,16) and health care management research.(8) Other areas of application included education,(6,14) or decision processes related to a hospital corporation(10) or physician group practice management.(12)

No articles used an established framework, although four were inspired by previously established frameworks. (2,4,5,14) No data was used to populate the frameworks.

The outcome was a definition of the elements of a framework key to a particular business model associated with either business processes or networks/systems. Those frameworks that described processes had a management focus and described both actors and process steps(9,10) and could even include "intangibles" such as culture and values.(12) Those frameworks that focused on networks encompassed elements at multiple layers in the system to capture the different actors, e.g. patient, government, industry, academia, hospital, insurer, physician, regulatory body.(1,7,17,19)

2. Financial Assessment

Eleven articles used frameworks for financial assessment. (20-30) The frameworks were applied in the context of either patient services(21,22,24,25,29) or non-clinical services (Pharmacy benefit management,(26) biobanks and clinical research support,(20,28) gene, radiation, and cell therapy(23,27)).

The frameworks included the Total Life-Cycle Cost of Ownership used in conjunction with a value chain framework (20) and fee-for-service approach.(28) The frameworks mainly included elements associated with financial data such as investments, costs (operational, processes, production, fixed and variable, monetary and time), resources, and activities (primary and support). Data included quantitative analysis of financial data (revenue and cost)(25,26,29) or a combination of literature reviews and interviews.(23,24,30)

The outcomes when using the frameworks were differentiation between reimbursement models (21,22,30) or determination of the financial viability of a service offering. (20,23-28)

3. Classification Based on Pre-Defined Typologies

Eleven articles used frameworks to classify and differentiate between business models according to different typologies. (31-41) With one exception,(41) all classifications occurred

at the organizational level of companies (e.g. individual pharmacies,(36,37) medtech companies,(36) or manufacturers of cell-based therapies(35)). The frameworks enabled classifications based on combinations of niche services, (41) activities, (31,40) channels,(33) or value disciplines,(32) e-value chains,(39) labor intensity,(38) organizational flexibility,(37) or based on other characteristics of relevance for a particular sector.(34-36)

In general, the frameworks included only two or three elements each. The most common element was the value proposition, which was present in seven frameworks.(31-33,36,37,41) Other elements were cost,(33,41) profit,(31,33) and resources,(31,36,38) or a juxtaposition of process characteristics (simple vs. complex) with process design (standardized vs. diverse).(40) Four included elements related to the external environment, e.g. pressure from the external environment(37) or regulatory bodies. Data came from interviews,(36,37) administrative systems and databases,(34-36,38,40) and surveys and observations.(38)

The outcomes of the frameworks were classifications centered on the key elements of resources, processes, products, strategy, or business/firms.

4. Business Model Analysis

4.1. Analysis without Comparison

Thirteen articles used frameworks to analyze business models and the relationship between individual elements.(42-54) The frameworks were applied in the context of health care systems,(42-46,50,54) academic medical centers,(51) dental care,(49) gene therapy,(53) e-pharmacies,(52) and medical device companies.(47,48)

The frameworks included Business Model Canvas,(42,43,46) the non-profit Balanced Scorecard,(50) Performance-based Incentive Compensation,(51) and Application Service Provision business model.(54) The elements of the frameworks were many and well balanced (e.g. infrastructure, financials, offering and customers) in so far as there was no obvious focus on one particular group of elements. Data came from interviews,(42,43,47,54) surveys,(54) case studies,(54) and administrative systems.(48,53)

The outcomes focused on understanding the relationships between the elements(44,45,47-50) analyze the effect of a reimbursement protocol,(51) understand the influence of technology,(42,43,46,52,53) or to understand the viability of a potential approach for making services more uniform across a health care system.(54)

4.2. Analysis for Comparison

Twenty-six articles used frameworks for a comparative business model analysis.(55-80) The frameworks were applied in the context of e-health,(57,58,71-74,76-78,80) imaging,(70,75) online pharmacies,(67) alternative medicine,(79) bio/medtech and pharmaceutical firms,(55,56,59,62,64,65) and profit/not for profit health care providers and hospitals.(60,61,63,66,68,69)

The frameworks included Open Business Model,(55,56,62) Business model design pattern,(72) Business Model Canvas,(57,69,71) Service, Technology, Organization, Finance (STOF) model,(80) Analysis of Life Science Innovation Systems methodology,(59) Health Grids,(74,77) Teece's business model approach to strategy together with an ecosystem theory,(65) value chains,(78) and the Johnson et al. business model.(60,66) The frameworks included many and multiple elements which covered both internal (value proposition, activities, resources, and financials) and external (vision, mission, strategic goals, value network, partnerships with suppliers and customers, competitors and markets, regulatory and legal regimes, and political climate) aspects. The data that was used for analysis came from single or multiple case studies or hypothetical cases developed from financial data or estimates,(63,64,78) simulations based on administrative and demographic data,(76) interviews,(55,56,58,62,64,65,79,80) ethnographic observations,(72,78) surveys,(62,65) company websites,(61,64,67) published cases and (peer-reviewed) literature,(60,61,68,71,79) and documents.(60,64,80)

The outcome of the analyses was a comparison of different business models(55-58,60,61,64-80) or their value proposition,(62) to illustrate the need for a new (co-development or dynamic) business model,(59,80) or to identify countries where the environment is more favorable for hospital expansion.(63)

5. Business Model Development

5.1. Business Model Development through Process Modeling

Eleven articles used frameworks that employed process-modeling techniques, often based on computer modeling.(81-91) The process-modeling frameworks were applied in the context of administrative registries,(84,85,91) outpatient surgery,(87) pharmaceutical delivery,(86) diagnostic support (radiology,(88) pathology,(83) lab,(81) and diabetes diagnostics(82)), process management,(89) and communicable disease reporting.(90)

The frameworks included Unified Modeling Language (UML) with or without Time Process Study comprised of process analysis and time and motion studies,(84,85,91) Medical Module (as a UML-class diagram),(89) IDEF0 and IDEF3,(90) Business Process Modeling Notation,(83) Situated, Strategic, and AI-enhanced method,(81) Object Process Methodology,(88) Business mapping framework,(86) and Define-Measure-Analyze-Improve-Control.(87) The frameworks contained elements related to the visualization and analysis of processes, such as value-stream mapping, the identification of resources, actors, and the value proposition. Data was obtained through administrative data,(85,89) interviews,(84,88) surveys,(84,85) workshops,(91) and case studies.(82,91)

The outcomes focused mainly on the development of digital-based services.

5.2. Development of e-Health Business Models

Twenty-one articles used frameworks to develop e-health business models.(92-112) The frameworks were all applied in the context of e-health. Seven were related to information management,(92-95,97,102,109) and ten in tele-monitoring and tele-treatment in remote areas,(107) preventive “precare”,(106) biofeedback in rehab,(104) and chronic conditions such as chronic heart failure,(102) chronic lower back(98) or shoulder pain and whiplash,(99,100) pediatric postural and movement disorders,(101) geriatric fall recognition,(103) or geriatric home-monitoring.(105)

The frameworks included versions of the Business Model Canvas,(92-94,103,104) visual business modeling kit,(106) STOF model(98) and dynamic STOF model,(99,100) e3 value model,(97,102) Research framework,(110) Freeband Business Blueprint Method,(101), a Business Modeling method comprised of many other models,(108) Balanced Scorecard,(96) as well as a value chain analysis alone,(105) or in combination with a five-forces and SWOT analysis.(111) All of the frameworks utilized multiple elements that included value proposition, actors and stakeholders, relationships, technological architectures, financial data, resources, and external factors which included market segments/niches, policies, and regulations. The data was collected through workshops, observations, interviews, diaries, and surveys, as well as administrative data. Action research or action design approach(98-100) and case study approaches(101,106,108,110) were also used.

The outcome was to generate e-health business models that supported strategic decision-making.

5.3. Development of Business Models for the Delivery of Clinical Services

Nine articles used frameworks to develop business models for clinical services.(113-121) The frameworks were applied in the context of clinical services at the single unit or organization level(113,115,117-119,121) or programs within a healthcare system.(114,116)

The frameworks included Balanced Scorecard,(113,115,119,121) and Strategic Business Unit.(116) Many different elements were considered: There was a focus on external aspects such as community perspectives,(119) collaboration,(118) and outsourcing.(115,117) Some of the frameworks used a patient(113,118,119,121) or activity perspective(115,120) as the point of departure. These approaches used more internally focused elements in their frameworks. The other frameworks used market(114) or financial competitiveness perspectives(116) as their point of departure. These frameworks included more externally focused elements. Several frameworks included an employee element such as their learning and growth.(113,114,119,121) No data was used to populate the frameworks.

The outcomes were the development of new or existing service delivery models(118,120) that were either financially viable(114-116) or considered financial viability.(113,119,121)

5.4. Development of Business Models to Enhance Competitive Advantage of Non-Clinical Services

Eleven articles used frameworks to develop a competitive advantage for non-clinical services.(122-132) The frameworks were applied in the context of diplomatic aid,(122) medical products,(127) clinical trial recruitment,(123) biobanks,(129,130) community pharmacies,(124,128) bio-tech startups,(125) academic medical centers,(131) personalized medicine,(132) and educational and consultancy services to health care organizations.(126)

The frameworks included Business Model Canvas(127,132) together with five-forces analysis,(129) seven different frameworks that shared a clear process focus on improving the internal(126) and/or external alignment of elements.(122-125,128,130) Data was obtained through reviews of the literature(122) or from undefined sources.

The outcomes focused on the development of new businesses or disruptive innovations where the improved alignment could be expected to lead to the development of a competitive advantage and increased market attractiveness.

6. Business Model Evaluation

Seven articles used frameworks to evaluate a single or multiple business model(s).(133-139) The frameworks were applied in the context of imaging services,(134,135) sanitation services,(138) digital services,(139) medical practices,(133,137) and plastic surgery.(136)

The frameworks included Base-of-the-pyramid impact assessment.(138) In some cases, different frameworks were combined. One framework combined Customer Relationship Management with Balanced Score Card, Supply chain management with Application Service Provision, the Architecture of Integrated Information Systems model, and Activity-based costing.(135) Another framework used four different frameworks related to the preconditions, process, strategy and evaluation of innovation.(136) The frameworks included several elements that covered internal and external aspects, including financials, value proposition, processes and employees and customers. It was unclear where the data that was used for the evaluation came from.

The outcome was an evaluation of the value of different work-models,(133) different or new business models,(134,137-139) the transferability of a business model to other hospitals,(135) or clinical domains.(136)

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