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LEAN, AGILE, AND LEAN AND AGILE HOSPITAL MANAGEMENT

Responses to introducing choice and competition in
public health care

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Lean, Agile, and Lean and Agile Hospital Management – Responses to introducing choice and competition in public health care

THESIS FOR DOCTORAL DEGREE (Ph.D.)

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Till pappa och mamma.

ABSTRACT

Introduction: The marketization of public health care, with its focus on choice and competition, challenges hospital managers to take a market-oriented perspective and position. A combination of lean and agile management strategies has been suggested as a way to achieve efficiency and control costs (lean) and to respond flexibly (agile).

Aim: To increase our understanding of how hospital managers can combine lean and agile management strategies as they face the challenges of choice and competition in public health care.

Method: The thesis consists of four studies: an integrative literature review and three case studies conducted at two Swedish hospitals. Study I reviews the empirical and theoretical literature on the use of agile strategies in relationship to lean strategies. The specific focus is how these strategies can be combined in hospital management. Study II is a case study of a hospital that followed “operational plans” as it tried to decrease patient waiting times. Study III is a case study of a hospital management team’s drivers and conceptualizations of lean and agile strategies related to expected outcomes. Study IV, which is a case study of the same hospital investigated in Study III, examines the mechanisms that enabled the hospital’s management team to use the lean and agile strategies in practice.

Findings: Study I shows that agile was portrayed as a new paradigm following lean, as a development of lean, or as a strategy that can be used in combination with lean. Unlike lean strategies, agile strategies focus on the management of the external environment using proactive, reactive, or embracive coping strategies. The study also examines various organizational capabilities that hospitals require in order to make optimal use of agile strategies. Study II finds that “operational plans” at various organizational levels were needed in order to operationalize the goal of decreasing patient waiting times. The study also finds that an aligned internal strategy can improve processes that span organizational boundaries although with a narrow production focus. Study III finds that sudden and unexpected political public health care policies and market pressure motivated a hospital management, already lean in operations, to look for ways to increase their agility. Agility in the study is conceptualised as the long-term capability for adapting to the environment and for managing budget reductions. Lean was understood as the ability of the hospital to perform its functions efficiently. Enablers were defined as the management’s ability to continuously react to changes, to alter work assignments to accommodate changes in the influx of patients, and to recruit employees with flexible work skills. Study IV finds that the mechanisms that help a

hospital to become lean and agile in practice are management's market-orientation, the use of established production processes, an organization-wide readiness for change, a rapid transition capability, and the flexible use of physical and human resources.

Discussion: Hospitals in uncertain and dynamic environments (as is typically the case for hospitals) needs to be both lean and agile. In combination, these two strategies help hospital management to use existing resources efficiently and effectively while at the same time it allows discovery of other assets.

Conclusion: Lean management may be viewed as a precondition for agile management. This means that the use of efficient and structured (lean) resources can improve market orientation and positioning (agile). To successfully combine lean and agile activities, hospital managers need to exhibit certain ambidextrous and dynamic effective management capabilities.

LIST OF SCIENTIFIC PAPERS

- I. **Sara Tolf**; Monica E. Nyström, Carol Tishelman, Mats Brommels, Johan Hansson. Agile, a guiding principle for health care improvement? *International Journal of Health Care Quality Assurance*. Vol. 28 No. 5, 2015 pp. 468-493.
- II. Johan Hansson; **Sara Tolf**; John Øvretveit; Jan Carlsson; Mats Brommels What Happened to the No Wait hospital? A Case Study of Implementation of Operational Plans for Reduced Waits. *Quality Management in Health Care*, 2012, Vol. 21, No 1. pp. 34-43.
- III. **Sara Tolf**; Monica Nyström, Carol Tishelman, Mats Brommels, Johan Hansson. Rationales for designing a lean and agile hospital: a managerial perspective. *Manuscript*.
- IV. **Sara Tolf**; Mats Brommels, Jan Carlsson, Monica Nyström, Johan Hansson. Hospital dynamic effectiveness: Mechanisms enabling rapid response to changes in demand while preserving efficiency. *Manuscript*.

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LIST OF ABBREVIATIONS

CQI	Continuous Quality Improvement
NPM	New Public Management
TQM	Total Quality Management

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PROLOGUE

When I did my basic training in organizational sociology 14 years ago at the Department of Sociology at Uppsala University, Sweden, I was intrigued by the way hospital organization was described. I remember that when an author or lecturer wanted a textbook example of a “difficult” organization to manage (due to its complexity), the example was often a hospital. Three aspects especially caught my attention and later inspired me to begin work on my thesis.

First, the stakes are high. A hospital must function 24/7 or else people will suffer. This requires an enormous coordination of human and physical resources. If a hospital fails, the consequences can be tragic. Second, a hospital is dependent on, and must cooperate with, many other stakeholders in order to offer the best care possible. If cooperation with those stakeholders (politicians, universities, other care providers, relatives, etc.) fails, patients are at risk of receiving fragmented care with inadequate services. Hospitals require sophisticated collaboration strategies. Third, hospitals have goals exceeding their own self-interest; to provide health care to all citizens, on equal terms. These goals must be reflected in all its actions. How do hospital leaders manage all these human and physical resources to achieve those high goals?

After I received my Bachelor degree in Sociology with a strong focus on organizational theory, I was privileged to work at the Karolinska Institutet and the Medical Management Centre in Stockholm. The research at these institutions is conducted in multidisciplinary contexts. I was fortunate to work with people from different professional backgrounds. Among these people were health economists, psychologists, physicians, nurses, sociologists, engineers, and pedagogues. All shared the goal of trying to understand and improve the management of health care organizations with the ultimate purpose of improving health. This meant that in my research, conventional disciplinary borders were less relevant because of the input from a number of different disciplines.

At this stage, I joined two research projects addressing complexities in hospitals. The focus of the projects was how innovations in hospital strategic management can improve the management of these complexities. I began to study the organization-wide change in one hospital’s administration in a search for ways to improve its internal operations to reduce waits. My focus was on improving processes and aligning goals throughout the hospital. I

was also privileged to follow another organization-wide change at a different hospital that aimed at combining capabilities that could lead to adaptations to external contextual influences and improvements in productivity and quality.

Although I was not involved in the initial design of either of these two projects, their general aims and ambitions matched my interest in complexities in hospital organization. I took part of nearly all data collection along with other members of the research teams. Because the research team members had different professional backgrounds, we had different interests in the projects. In some instances, this meant we had to make compromises in the direction data collection would take.

Both research projects were based in theories and assumptions related to management strategies that were originally developed at non-health care organizations, predominantly manufacturing companies in the private sector. It is, of course, debatable whether strategies developed in a non-health care setting are suitable for health care organizations. The adaptation of these strategies to the special conditions of a health care organization is discussed in this thesis.

During the progress of these two research projects, I realized I needed a deeper understanding of previous research (including fundamental principles) on the subject of my thesis. I required this understanding in order to make further theoretical comparisons and generalizations in the health care context. For that reason, I conducted an integrative review in which the focus was the enablers of the subject (i.e., the phenomenon) of my research. That subject is the interaction between the organization and its external environment (agile management) in combination with internal improvements in processes and their coordination (lean management).

The concepts of agile and lean are of special interest in this thesis since one of the two empirical cases aims to design the hospital to become both lean and agile, whereas the other empirical case aimed at improving processes, which later developed into an explicitly stated lean program.

In this thesis the integrative review is positioned as a basis on which to reflect upon the three empirical studies to further understand the concepts lean and agile and the relationships between them in health care contexts.

However, to simplify this discussion, I note that this thesis aims to position the concepts of lean and agile in a wider perspective. Which problems do they attempt to solve? Which

goals do they try to achieve? To answer these questions, I examine the concepts of lean and agile in relation to organizational theory as I aim to understand and explain them.

In sum, the concepts examined in this thesis are an effort to begin to satisfy my initial curiosity about hospital organizations and their complexities.

1 INTRODUCTION

1.1 SWEDISH HEALTH CARE

The Swedish health care system is required to provide health care to all citizens and residents in accordance with the principles of human dignity, need and solidarity, and cost effectiveness (Anell et al. 2012). Although the Swedish national government has overall responsibility for health care policy, the immediate responsibility for providing health care in Sweden lies with 21 regional, self-governing authorities (county councils) (Saltman 2014). Health care in Sweden is mainly tax funded. Local authorities are elected by popular vote to the county councils.

County health care is an integrated system of county-owned health care providers and contracted private health care providers. The majority of the county councils are controlled by market governance, which means they set the tax rates and approve the various health care providers following a democratic selection system. The county councils delegate the provision of health care to the providers. In this system, health care policy and goals are set at one level, and the provision of health care occurs at a different level. Thus, an “internal market” in each county arises in which the county council acts as both market maker and a market regulator. Based on citizen needs, the county council representatives order treatments from the providers. The county councils therefore must know which providers are available, request price quotes, and choose the best provider or providers (Hallin & Siverbo 2002).

1.2 HOSPITAL MANAGEMENT IN TRANSITION

The introduction of market-like mechanisms in the public sector, such as choice and competition in public health care, has had important implications for hospital managers. Hospital management emphasizes efficiency so that limited resources can produce the best possible results. Traditionally, in the management of these resources (under tight budgets), hospital managers focused on internal processes. However, recent years have witnessed the marketization of health care (Andersson 2017; Bryson & Crosby 2014; Bergmark 2008). This change to a focus on external processes means more attention is paid to service users’ preferences and to the performance of other health care providers. Hospital management has had to take a market-oriented perspective (Ginter et al. 2013; Osborne et al. 2012).

To date, however, the primary focus of hospital management remains on the optimization of internal processes despite the recognition that the external conditions should be dealt with

more directly if hospitals are to survive in their present form. This new market position has many implications for hospitals: patients have more power, outcomes are scrutinized more carefully, and comparisons are made with other health care providers (Osborne et al. 2012). Choice and competition have made the health care environment for hospitals unpredictable and challenging.

For years, hospitals in Sweden and some other European countries were structured as vertically integrated hierarchies. In this structure, hospital management is at the top in a command and control position. However, hospital managers (usually political appointees) derive their authority from government institutions (e.g., county councils). These political bodies retain decision-making authority on hospital resource expenditure and allocation, staffing, and other functions (Saltman et al. 2011). This direct bureaucratic control, which establishes clear lines of political accountability, means that local hospital managers have limited freedom in operating their hospitals (Brunsson & Sahlin-Anderson 2000). Because of this structure, hospital managers (and to some extent, other medical staff) are limited in how they can respond to both internal and external conditions (Bryson & Crosby 2014). In the 1980s, when rationalization and cost reduction were introduced in hospitals and other health care organizations, hospital managers faced a grave dilemma. It seemed a trade-off had to be made between patient care and hospital finances. The criticism of public health care, which was severe, came from all sides of the political spectrum. Health care was said to be ineffective, bureaucratic, inflexible, rigid, and unresponsive. The criticism broadened from public health care to all public services (Bryson & Crosby 2014; Anell & Gerdtham 2010).

In public health care, the question was: How do we strike the right balance between the delivery of quality patient care and the control of rapidly increasing costs? Various answers have been proposed. One of the most salient efforts is the introduction of governance models and management strategies that focus on effectiveness and increased accountability.

1.2.1 New Public Management

During the 1990s economic governance models that were clearly inspired by market mechanisms were introduced in Swedish public health care. These models, which often related to the concept of New Public Management (NPM), aimed to increase effectiveness of service and clarity on accountability issues (Berlin 2013). According to Hood (1995), NPM emphasizes the following principles: increased professionalization of management; greater use of established management tools developed in the private sector; more focus on competition in internal markets (intended to reduce costs and improve the quality of care);

and a clearer division of responsibility/accountability between purchasers and providers. In addition, NPM supports more emphasis on results calculated by formal and measurable standards.

1.2.2 New Public Management in Sweden

Sweden was an early adopter of NPM principles. As early as the 1980s, a wave of health system reforms was introduced in Sweden that were triggered by concerns about efficiency and quality (Saltman 1997; Paulsson 2017). An example was the purchaser/provider split that defined the separation between political bodies and health care providers. This reform sought to introduce more flexible arrangements for service delivery, to stimulate greater institutional autonomy, and to encourage more effective integration among different types of services (Saltman et al. 2011). This reform also introduced competition among health care providers, some of which were private entities and others were public-private partnerships (Bergmark 2008).

Another “reform”, or rather a national strategy, in Sweden was the introduction of regional comparisons of indicators among health care providers. Such publicly available comparisons present rankings (by county councils) based on data about health care providers’ finances, patient satisfaction, availability, and clinical results for different diagnoses. The purpose of this reform was to stimulate the development of efficient health care with good quality (Blomgren & Waks 2011; Anell et al. 2012). This reform also promoted competition among providers despite its primary goal of identifying “best practices” through the optimal use of health care processes (Blomgren & Waks 2011).

Another important health care reform adopted in 2010 in Sweden was patient choice. This policy reform, which gives patients the right to choose primary health care providers, was politically motivated by the public demand to recognize patients’ health care rights. The policy was seen as a way to empower the patient (Winblad 2008). One argument in support of the policy is that representative democracy does not always work as it should. Patients should have the right to make their own health care decisions. A second argument was that greater patient choice would, in the long run, enhance efficiency by eliminating providers of lesser quality. Such providers would be deselected, as in an “ordinary” competitive market (Hallin & Siverbo 2002).

A number of counties and municipalities introduced patient choice in specialized care and social service, allowing private providers to enter those markets (Hartman 2011). Between

2007 and 2012 county councils purchases from private for-profit providers increased by 56 percent (Dahlgren 2014).

1.3 INTERNAL MANAGEMENT FOCUS

One reaction from hospital management to the marketization of the health care sector has been to look inward in order to improve the efficiency of core hospital activities (Haveman et al. 2001). Hospital management's main effort has been directed to adopting quality improvement management strategies from private sector practice - such as Total Quality Management (TQM), Continuous Quality Improvement (CQI), and lean management initiatives (Gowen III et al. 2012; Radnor & Johnston 2013; Shortell et al. 1995).

A commonly shared assumption about these models is that they improve performance quality while still controlling cost increases (Shortell et al. 1995; Costa & Godinho Filho 2016). Another assumption is that these models, when viewed as fundamental processes, can improve systems (or processes) rather than simply correct "after-the-fact errors of individuals" (Shortell et al. 1995, p. 378), as many quality assurance models propose (Walshe 2009).

A systems perspective emphasizes integration between the sub-processes and between professionals. This perspective, which focuses on the end user or the "customer", maintains that end-user value should influence quality. In the waste minimization concept known as lean, for example, activities that do not add value for the end user are considered waste.

Another principle common to CQI, TQM, and lean is the focus on continuous improvement using constant reflection to improve workflows by reducing waste and adding value (Waring & Bishop 2010). Clearly, there are differences among these models, but as the following descriptions reveal, they all emphasize user and system perspectives.

TQM: *Team-based process improvement projects and a customer orientation across the organization* (Øvretveit 2000, p. 79).

Lean: *Lean as a systematic approach to identifying and eliminating waste through continuous improvement, flowing the product at the pull of the customer in pursuit of perfection* (Andersson et al. 2006, p. 286).

CQI: *A focus on processes and systems of care, not individuals, requiring a multidisciplinary approach and examining all aspects of care related to structure, process, and outcome. CQI requires the health care organization to*

constantly evaluate and revise processes to better meet the needs of patients and stakeholders (Feldman & Alexander 2011, p. 106).

As used in hospital management, these models emphasize the internal processes that promote efficiency and effectiveness. As noted above, these management models do not emphasize external processes despite their importance to the well-functioning of hospital administration. Because NPM-inspired health care reforms introduce markets, it is essential to learn how health care providers deal with this new focus on competition and choice.

1.3.1 Lean management

Lean thinking originates in the manufacturing industry, specifically car manufacturing at Toyota in Japan. Womack et al. (1990) coined the term “lean” when they described the Toyota Production System with its steps for improving efficiency and effectiveness. Boyle et al. (2011, p. 589) describe the goal of lean as follows: “to improve overall levels of quality, productivity, integration and waste reduction”.

The core of lean management can be summarized in five general principles (Womack & Jones 1996; Drotz & Poksinska 2014):

1. Defining value by the end customer. Move away from a focus on the provider perspective on value to the customer perspective on value. This requires close collaboration and interaction with the customer.
2. Mapping the value stream. Identify the parts in processes that do and do not add value. Change those that do not add value accordingly.
3. Creating flows. Establish work processes that flow smoothly across occupational and organization boundaries. These boundaries should not disturb the creation of total value.
4. Establishing pull. Respond to the customers’ needs rather than the suppliers’ needs.
5. Seeking perfection. Standardize processes and make them transparent so that they contribute to continuous improvement.

In the late 1990s, lean thinking was suggested as a useful management philosophy that health care providers might adopt in their effort to improve quality and efficiency. By promoting service processes that create value (and avoid waste) and that are patient-centred, lean seemed to have promise as a way to improve the management of health care facilities (de Souza 2009; Walshe 2009; Andersen et al. 2014). Given the pressure for cost control in health care, lean was attractive to health care administrators.

Lean health care is often described as a process improvement strategy in which the patients' perspective on value influences the kind and delivery of health care services. Lean health care intends to link all value-adding steps in a seamless value stream (Parnaby & Towill 2008; Jones & Mitchell 2006). Quality and efficiency are in focus (de Souza 2009). Thus, lean health care seeks to improve patient care in hospitals/clinics, increase the focus on care, minimize disturbances from structural barriers, offer support to employees, contribute to improvements in staff morale, reduce costs, and decrease waiting times (Costa & Godinho Filho 2016).

Lean thinking emphasizes a holistic view of process improvement. This view is especially relevant in hospital care where a patient may go through many processes across units. Applying lean to single processes does not ensure increased value for the patient because every process in a value chain must be considered if the goal is to create total value (Joosten et al. 2009). A narrow focus on "fixing problems" is a focus on a single process. Such a focus does not consider effects on, and relationships with, other processes. In fact, the single process focus may actually shift problems to elsewhere in the system (Pokinska 2010).

Supporters of lean health care point to its positive outcomes. They claim that lean increases accessibility, shortens waiting and treatment times, controls costs, and reduces errors. They also claim that when employees are given a more active role as problem solvers, which lean promotes, the work environment becomes more predictable and hence less stressful (Pokinska 2010; Lodge & Bamford 2008; Ulhassan et al. 2013; Radnor et al. 2012).

Critics, however, have noted various problems that lean health care struggles to solve. One review concludes that several studies show "narrow technical applications with limited organizational reach" (Mazzocato et al. 2010, p. 381). Another review charges that the flow orientation is difficult to implement in lean health care because of strong professional and unit boundaries (Hellström et al. 2010). Yet another review concludes that lean health care is "performed in a superficial way, by implementing simple techniques of notorious knowledge in the manufacturing area" (Costa & Godinho Filho 2016, p. 829). As a remedy for these problems, some researchers have encouraged senior managers to align lean thinking with other areas throughout the entire health care organization. A holistic approach to lean health care should be adopted (Mazzocato et al. 2010; Pokinska 2010).

One criticism of particular concern is that lean thinking in health care, despite its alleged primary focus on the patient, does not actually increase patient satisfaction. The explanation offered in the research is that health care employees define value more from the care

provider's perspective than from the patient's perspective (Poksinska et al. 2017). According to some studies the primary focus in lean health care tends to be efficiency and costs rather than patient satisfaction (Radnor et al. 2012; Drotz & Poksinska 2014).

Other critics charge that lean thinking in health care focuses too much on improving internal operational processes in public organizations without linking them to their external service delivery. There is a tendency to create "pockets of best practice" with a potential for sub-optimization of the total patient episode (Radnor et al. 2012).

When health care researchers and public sector researchers debate lean in health care, the argument is sometimes that lean "picks the low hanging fruit". This complaint means that lean health care generally focuses on design deficits in processes. When these deficits are corrected, they produce local successes in the short run, but have little effect on the overall effectiveness of systems. According to Radnor and Osborne (2013, p. 275), the intent of lean is not to correct faulty design but rather to "improve the effective delivery of end-outcomes to the external users of public services and to add value to their lives in doing so".

In the search to perfect internal processes, managers who adopt lean are likely to find reduced organizational flexibility and less organizational capability for responding to new conditions as expressed in the following quotation by Andersson et al. (2006, p. 289):

Lean requires a stable platform, where scale efficiency can be maximised. Highly dynamic conditions cannot be dealt with, as there is no room for flexibility due to the focus on perfection, which is always a function of particular market conditions at a certain period of time.

1.4 EXTERNAL MANAGEMENT FOCUS

To respond to the changing environment of the integrated and market-oriented health care system, Osborne et al. (2012) argues that hospital management should take an approach that is more externally focused. A narrow focus on intra-organizational processes in an era in which health care services delivery is really inter-organizational is not fit for purpose. This is a call for "external strategic management" that recognizes the current dynamic environment of health care (Ginter et al. 2013).

1.4.1 Agile management

In this thesis, agile management is the term used to describe the external strategic intent of hospital management (Meredith & Francis 2000). The concept of agile management first

emerged in manufacturing in reaction to increasingly volatile and competitive business environments. In such environments, new products and even whole markets appeared, transformed, and disappeared within shorter and shorter periods of time. Competition was now more than price competition and operational efficiency; competition required organizations to respond rapidly, innovate creatively, and customize their goods and services. This was competition in an increasingly turbulent environment (Meredith & Francis 2000).

In their seminal book, *Agile Competitors and Virtual Organizations-Strategies for Enriching the Customer*, Goldman et al. (1994, p. 8) define agility as follows: “The ability to thrive in a competitive environment and unpredictably changing market opportunities”. Christopher (2000, p. 38) defines agility as the ability of an organization “to respond rapidly to changes in demand, both in terms of volume and variety”. The first definition emphasizes the proactive side of agile management; the second definition emphasizes the reactive side of agile management.

Several researchers argue that agility is not just about reacting or responding to the turbulent environment. Instead, agility is about using the changing market as a source of opportunities. These reactive and proactive strategies (Goldman et al. 1994; Sharifi & Zhang 2001; Brown & Bessant 2003) are addressed in several articles on agile organizations. Reactive agile management allows organizations to respond to changes while proactive agile management uses and shapes the environmental changes for its own benefit (Sajdak 2015).

Some scholars also differentiate between *strategic* agile management and *operational* agile management. With strategic agile management, the organization has an external orientation to its environment as far as market segments, market dynamics, competitors’ behaviour, and technological possibilities. All these factors should be analysed in the context of their effect on the organization. With operational agile management, the organization has the capability to quickly reconfigure existing processes and to create new ones in response to the market trends discovered using strategic agile management. This requires a functional implementation process, a quick synthesis of organizational resources, and cooperation with other organizations, including competitors (Sajdak 2015; Goldman et al. 1994).

Goldman et al. (1994) explain that we have no formula for how to be an agile organization. Such agility depends on each organization’s context. However, they suggest a set of

guidelines or strategic dimensions that can help organizations “thrive in a competitive and unpredictably changing market . . .” (summarized from pp. 71-120):

1. Organize to master change and uncertainty

An agile organization must have flexible organizational structures that allow reconfigurations in order to respond to sudden changes in demand. The structures must have routines for enabling and empowering personnel to act as new opportunities appear. The agile organization is different from traditional command and control organizations because it promotes leadership that sets strategic goals, and then, through trust and motivation, enables personnel to achieve them. An agile organization must be able to reconfigure departmental boundaries in order to combine new combinations of expertise and equipment that can satisfy current demand.

2. Leverage the impact of people and information

An agile organization competes through its people, not its price. Customers pay for access to people who can synthesize information and knowledge as solutions that produce total value. Therefore, an agile organization must leverage the impact of people and information at the operational level. Personnel must be flexible, creative, and willing to learn new things and use new information.

3. Cooperate to enhance competitiveness

An agile organization brings products/services to market as quickly and efficiently as possible. The time between the idea for a new product to its sale should be as short as feasible. The idea is to have a short product time cycle. This requires the wise allocation of relevant competences and resources by synthesizing organizational resources, by integrating professionals and departments, and/or by partnering with other organizations. In certain circumstances, it may be far more effective to form cooperative product development alliances than to develop products internally. Such partnerships, or alliances, are sometimes referred to as virtual organizations. They require a high level of trust among the parties.

4. Enrich the customer

An agile organization sells solutions rather than single products or services. This means that specific products or services are only the means to implement solutions that add to total customer value. This requires an interactive, trusting, and long-term

customer relationship throughout all stages of the total value process. This process means offering the customer individual solutions instead of standardized products or services aimed at a specific customer segment. In short, the customer participates in the design of the solution. (See also Meade & Sarkis 1999; Guisinger & Ghorashi 2004).

Steven L. Goldman and Carol B. Graham (1999) are the editors of the book, *Agility in Health Care: Strategies for Mastering Turbulent Markets*. One of the arguments made throughout the book is that the principles underpinning agility are as relevant for health care organizations as for private manufacturing firms. The claim is that health care organizations should shift from a focus on perfecting “stand-alone entities” to a focus on collaboration with suppliers, customers, and even competitors in value-adding networks. “Health care organizations too must create networks for the production of health care solutions, rather than discrete products or services, by developing innovative relationships with one another” (p. 25).

At the start of this thesis project, health care management literature had still not comprehensively examined the concept of agility. Recently, however, a few publications describe agile supply chains in health care. Aronsson et al. (2011) suggest that agile process strategies can be used to cope with, for example, patients admitted in emergency departments where the supply chain should be organized for quick response and flexibility (agility). Williams (2017) recommends agility in health care as a principle that takes a more integrated approach (with other providers) as increasing numbers of patients with complex and multiple conditions require treatment. The use of agile process strategies, Williams claims, may help create seamless patient pathways across different providers by adopting “joined-up care”. Nevertheless, the research is still scarce on how managers rationalize and act in practice when adopting agile management.

In formulating a competitive strategy, an organization focuses on how it competes in a market, in particular how it positions itself relative to its competitors. The focus of such strategy should be on establishing and maintaining a profitable and sustainable position. Hallgren and Olhager (2009) recognize that organizations make different strategic choices based on the strategic orientation of management.

1.5 LEAN AND AGILE MANAGEMENT

Some of the manufacturing literature addresses the combination of lean management and agile management in relative detail. Several researchers argue that the strategies should be

combined since they answer to different needs, low costs (lean) and quick responsiveness (agile), both highly valuable for efficient and effective production (Vázquez-Bustelo & Avella 2006; Aronsson et al. 2011).

However, other researchers argue it is difficult to combine lean management and agile management. The explanation is that the combination of flexibility and efficiency is one that traditional organizational theory regards as paradoxical. The paradox is that an organization's efforts to be both lean and agile at the same time may result in rather mediocre performance.

Goldman et al. (1994), however, maintain that both strategies are needed in order to be competitive. They describe the quality models, such as TQM, CQI, and lean, as *tactical* responses to market place pressure. These models, which reflect the movement to improve a current situation, reflect an acceptance of the status quo. Agile management, on the other hand, is described as a *strategic* response. By challenging the status quo, this strategy acknowledges discontinuity in the market place. Goldman et al. suggest that tactical responses to the market place should be combined with strategic responses to the market place. The tactical responses should be incorporated into strategic goals that match new competitive realities.

Katayama and Bennett (1999) regard the simultaneous accomplishment of leanness and agility as a necessity for long-term competitiveness. They associate leanness with efficient use of resources and high performance whereas they associate agility with capabilities that address customer requirements.

One way to combine the two strategies is to apply lean management in production where demand is relatively stable and where efficiency improvement in products is in focus. These production lines may be somewhat planned ahead as far as the process and capability activities. Agile management can be used in production when demand is sudden and unexpected. In such cases, the organization must be flexible (i.e., agile) (Aronsson et al. 2011).

Another way to combine lean management and agile management occurs when creating the temporary capability for meeting periods of peak demand (versus ordinary and contrasting periods of base demand throughout the year). To meet peak demand, temporary capability is acquired from outside the organization. This temporary capability is no longer needed when the period of peak demand ends (Thomas et al. 2006).

2 AIM

The aim of this thesis is to increase our understanding of how hospital managers can apply and combine lean and agile strategies to manage choice and competition in public health care.

The research questions underlying this thesis are:

- How do lean and agile management strategies interact?
 - as evidenced by the literature (Study I)
 - as understood and perceived by a hospital management team (Study III)
- What rationale does a hospital management team offer for adopting lean and agile management strategies at the hospital? (Study III)
- Which mechanisms enable a hospital strategic management team to implement lean and/or agile management strategies in practice? (Studies II and IV)

3 METHODS

3.1 EMPIRICAL SETTINGS

The empirical data in Studies II, III, and IV derive from the strategic change efforts conducted at two publically funded hospitals operating in two different regions in Sweden - Hospital A and Hospital B. Table 1 presents some key characteristics of these hospitals. Both hospitals faced competitive and political pressure resulting from the market reforms described above. In response, the hospitals initiated organization-wide strategic changes intended to deal with that pressure (see Section 1.2.2). The research team selected these two hospitals because they represented unique and innovative approaches to strategic change.

Table 1: Characteristics of Hospital A and Hospital B

	Hospital A	Hospital B
Region	Metropolitan region	Smaller town region
Employees	3300	500
Number of beds	500	130
Catchment area	440 000	600 000
Departments	10	2
Turnover	2 867' SEK	600' SEK

3.1.1 Hospital A: No-wait hospital via operational plans

In 2008, Hospital A hired a new CEO. Externals demands on the hospital were many, and to some extent quite new. The CEO was convinced that the hospital's management had to change to meet these new demands. Working with an external consultant, the CEO initiated an organization-wide strategic change process aimed at defining and clarifying the vision and goals for the hospital. These goals were to be disseminated throughout the hospital.

The initial step was to engage the hospital management group in the work of identifying the hospital's vision and goals based on an environmental scanning. Next, the change effort was initiated via operational plans and structured implementation intended to increase efficiency and goal alignment that would decrease patient waiting times. One goal was to make the hospital "queue-free" by improving processes. A second goal was to become a top ranked hospital. In late 2009, Hospital A adopted a lean management change strategy aimed at achieving these goals (Ulhassan 2014).

3.1.2 Hospital B: Designing a lean and agile hospital

During a ten-year period (1999-2009) Hospital B experienced several major external pressures, including policy changes when the regional hospital sector was restructured. This restructuring resulted in the following: the removal of established services and the addition of new ones, the introduction of patients' free choice of primary health care provider, changes in the national health care guarantee of acceptable time periods between diagnosis and treatment, and several regional demands related to cost reductions.

These challenging and abrupt changes and events created turbulence in the hospital's operational plans and procedures that were based on a flow and process orientation and a six-month planning period. The hospital's management group decided it had to develop capabilities to make better and faster adaptations to these externally mandated changes and to coordinate them with internal processes for increased efficiency.

Therefore, hospital management initiated an organization-wide, strategic change initiative designed to meet these new challenges. Management met with two university research teams: a team from medical management at one university (the thesis author is a member of this team) and a team from business logistics at another university. The research teams and the hospital management group launched a project aimed at exploring how effectiveness (lean) and dynamic capability (agile) could be combined. The researchers wanted to study the strategic change initiative from different perspectives and, if possible, identify mechanisms that influenced its outcome.

3.2 OVERVIEW OF THE STUDIES

In preparation for the analysis of the data from Hospital B, a preliminary literature search was performed that revealed the need for more extensive and systematic scrutiny of the literature of agile management in health care. To meet this identified need, an integrative literature review was conducted. Because of the extent of this review and the novelty of its findings, it was published and is now included in this thesis (Study I).

Table 2: Overview of the four studies

	Study I	Study II	Study III	Study IV
Case	Integrative review: Agile, a guiding principle for health care improvement?	Hospital A: No-Wait hospital via operational plans	Hospital B: Designing a lean and agile hospital.	Hospital B: Designing a lean and agile hospital.
Focus of analysis	Understanding definitions and enablers of an agile organization and how agile management relates to lean management	Why, how and for what did a strategic management group adopt operational plans to reduce waits?	Why and for what did a strategic management group choose to adopt a lean and agile design?	What mechanism s enables a lean and agile hospital?
Research design	Integrative review	Case study	Case study	Case study
Data gathering	Articles describing an agile organization (definition, enablers, relation to lean, n=60)	Individual interviews (n=8), focus group interviews (n=10), archival data and meeting minutes (n=45 documents?)	Individual interviews (n=39), observations (n=3), documents and archival data, meeting minutes (n=100 documents?)	
Analysis	Content analysis	Content analysis	Content analysis	Explanation building pattern matching
Data collection – time periods covered	Time span of articles: 1994-2012	Sept 2008-Oct 2010	Oct 2009-Aug 2012	

3.3 STUDY DESIGN

3.3.1 Integrative literature review

In Study I, we designed an integrative literature review with the aims of obtaining a comprehensive understanding of the subject of interest (agile and its relationship to lean) and of synthesizing implications for improvement in designing hospital management processes. Since the concept of agile, combined with the concept of lean, is not widely applied in health care, other areas were included in the review.

An integrative literature review allows for varied perspectives on a phenomenon and includes empirical and theoretical literature with diverse methodologies (Whittemore & Knafl 2005). An integrative review also aims to integrate existing ideas with new ideas in order to generate new perspectives on a phenomenon instead of merely reporting aggregated data

from previous literature (Torraco 2005; Gough et al. 2012). In this thesis, the findings on agile and its relationship to lean were synthesized with other organizational theories as a way of exploring potential implications for the improvement of hospital organizations.

Gough et al. (2012) distinguish between aggregative and configurative literature reviews. Aggregative literature reviews *test* theories and combine similar forms of data in order to detect homogenous patterns in research studies. The ultimate aim is to provide greater certainty regarding the magnitude and variance of a phenomenon. Configurative literature reviews *generate* theory and identify patterns from the heterogeneity of data in order to provide new ways of thinking about an area of interest. The ultimate aim is to identify implications for future research. The integrative literature review in this thesis has the same characteristics as a configurative literature review.

3.3.2 Case study

A case study design was selected for the studies on the two hospitals (Studies II, III, and IV). Generally, case studies, which try to describe and understand the dynamics of real life settings, are appropriate for research on contemporary phenomena in open systems where events, processes, and context cannot be controlled and where the boundaries between them are unclear (Yin 2014; Eisenhardt 1989). Surroundings continually influence most hospitals. A case study research design facilitates a holistic understanding and explanation of factors that influence complex social phenomena (as contrasted with reductionist research designs that seek to understand the simpler components of phenomena) (Patton & Appelbaum 2003).

The case study design is appropriate when the researcher is examining unique events and conditions and is testing propositions believed valid. The hospital cases in this research are unique, especially with respect to their different goals. While both hospitals had clear plans to test innovative ideas, Hospital A sought to reduce patient waiting times via operational plans, and Hospital B sought to improve efficiency of operations using the agile and lean concepts.

An inductive, exploratory approach was chosen for Studies II, III, and IV. The case studies aimed to describe the content and process of the two hospitals' plans and actions combined with analyses of outcomes. Because of the novelty of using the agile and lean concepts in a health care setting, it was important to move from the specific to the general. The intent was to avoid forcing data into the frameworks of theories developed in a context that differs from the context of these case studies (Elo & Kyngäs 2008; Hsieh & Shannon 2005).

3.4 DATA COLLECTION

Data were collected via interviews, various documents, other archival data, and observations. The use of multiple data sources was chosen for comprehensiveness, with the additional benefit of increasing the trustworthiness of the research. At the same time, these multiple data sources provided rich material useful for understanding the hospitals' strategic changes (Patton 2008; Denzin 2009; Yin 2014).

An adaptive process was used in the data collection in which reflections on the findings in one data collection batch led to the next data collection batch (see Appendix B). Case notes were taken throughout the process of data collection. The informants reviewed these notes for any misunderstandings or omitted information. Thereafter, all data were organized as time series (see Appendices C and D) before preparing the case descriptions. Table 3 and Table 4 summarize the data collection for Hospital A and Hospital B, respectively.

Table 3. Overview of data collection for Hospital A

Methods	Time of data collection	Purpose	Key informants
Individual interview	T1: Sept 2008	Initial overview and program theory	CEO (n=1)
Individual interview	T2: Jan 2009	Initial overview and program theory	Consultant (n=1)
Individual interview	T3 : Feb 2009	Initial overview and program theory	CEO (n=1)
Individual interviews	T4: Feb 2009	Initial overview, historical context, intermediate outcomes and reflections of the development work.	Directors of Department (n=2), the head of finance (n=1), the head of marketing and communication (n=1), former head physician (n=1), and development leader (n=1). Total: n=6
Focus group interviews	T5: May-June 2009	Intermediate outcomes of the operational plans	Representatives of unit managers from all ten clinical departments (10 focus group interviews, n = 47 participants, 3-5 managers in each)
Individual interview	T6: October 2010	Intermediate outcomes of the operational plans	Head of marketing and communication (n=1)
Documents and archival material	T 1-6: Throughout the research	To contextualize and cross check information.	Meeting minutes, operational plans, internal presentations/reports, regional documents (n=45)

Table 4. Overview of data collection for Hospital B (* L&A = lean and agile)

Methods	Time of data collection	Purpose:	Key informants
Individual interviews	T1: Oct 2009	Initial overview and program theory	Management group (n=5)
Individual interviews	T2: Nov 2009/Feb 2010	Basic principles for development work	Unit managers (n=12)
Individual interviews	T3: Feb 2010	Critical events that led to the decision and strategic work on L&A*	Management group (n=5)
Observations of conference	T4: May 2010	How L&A was described and presented to the physicians	Physicians and strategic management group
Observations of conference	T5: June 2010	How L&A was described and presented to the unit managers	Unit managers and strategic management group
Observations of conference	T6: June 2010	How L&A was described and presented to the union representatives	Union representatives and strategic management group
Interview	T7: Oct 2010	The urology case	CEO and project leader (n=2)
Individual interviews	T8: Oct 2010	Experiences and perceptions of the strategic work on L&A including definition of concepts	Strategic change management group (n=7)
Individual interviews	T9: Feb 2011	Experiences and perceptions of the strategic work on L&A including definition of concepts	Management group (n=4)
Individual interviews	T10: Aug 2012	Experiences and perceptions of the strategic work on L&A including definitions of concepts and contextualizing and validating data collected from previous interviews	Management group (n=6)
Documents and archival material	T1-10: Throughout the research		Meeting minutes, annual reports, media articles, internal presentations/reports, political decisions, and regional documents (n=100 documents)

We used the model for strategic change developed by Pettigrew and Whipp (1991) to guide the data collection for the three empirical studies of this thesis. The model has three essential change dimensions that are needed to understand strategic change as holistically as possible: content, context, and process. Data collection focused on the “*Why* (context), the *What* (content), and the *How* (process) of strategic change” (Stetler et al. 2007, p. 1).

Several assumptions related to the model are relevant. The first assumption is that the interplay among these dimensions determines the outcomes of a strategic change. The second assumption is that it is impossible to understand strategic change if it is viewed as a separate

episode, detached from the historical, organizational, economic, or political circumstances from which the change emerges (Pettigrew & Whipp 1991). The third assumption is that a linkage exists among the three dimensions. For example, context constrains organizational processes and also shapes the context. Pettigrew and Whipp emphasize the importance of linking these dimensions to the outcome of the strategic change. If data are collected in relation to these three dimensions, it is more likely the research can achieve an in-depth understanding of the strategic changes. These dimensions were useful for preparing the interview protocols (see Appendices A and B).

Finally, the framework emphasizes the importance of considering several system levels. For example, the researcher should consider how regulators or organizational structures enable or hinder the diffusion of the innovative strategic change. This multi-dimensional approach is appropriate when studying organizational phenomena in a real life context (e.g., the hospital context for the lean and agile concepts).

3.5 DATA ANALYSIS

Qualitative content analysis influenced by Hsieh and Shannon (2005) was used in the data analysis for Study I and Study III. For data analysis in Study II content analysis as described by Silverman (2006) was used. Study IV draws on an explanation building pattern-matching technique as described by Yin (2014).

3.5.1 Qualitative content analysis (Studies I, II, and III)

Qualitative content analysis is used to interpret the meaning of the content of a text or verbal and visual communication (Cole 1988). It is defined as a systematic means of describing phenomena (Krippendorff 2012). The process of qualitative content analysis helps condense vast textual material into a manageable number of content categories that include words and phrases sharing the same meaning and that lead to a broad description of the phenomena. Content analysis is usually performed either inductively or deductively.

This thesis takes an inductive approach, partly due to the novelty of the phenomena in health care and the explorative research method. The content analysis of the data in Studies I, II, and III, which was performed in similar ways, was mainly influenced by recommendations from Hsieh and Shannon (2005), Graneheim and Lundman (2004), and Silverman (2006). Content related to the research questions in each study was used to derive categories and themes in a three-step procedure. First, the material was read through to get a sense of the whole. Second, units of text that shared the same meaning were sorted into categories. Third, the categories were arranged into themes. The categories and themes were discussed and refined by the

author and a member of the research team in a process informed by negotiated consensus (Bradley et al. 2007).

3.5.2 Explanation building analysis (Study IV).

An explanation building analysis approach was used to identify patterns of causal conditions for combining lean and agile strategies in Study IV. The analytic technique for building explanations is a form of pattern matching. The goal of pattern matching is to identify patterns that explain the case or the outcome achieved (Yin 2014). The focus is on stipulating assumed reasons for how and why something happened. This explanation building technique, based on narratives (in this thesis, descriptions) is used when causal links are too complex to measure using precise measurement techniques.

3.5.3 Summarizing framework

A framework originally presented by Vázquez-Bustelo et al. (2007) and further refined by the thesis author was used to summarize the findings for presentation in this thesis. This framework supported the summary of the triggers and enablers of intended outcomes.

3.6 STUDY DESIGN, DATA COLLECTION, AND ANALYSIS FOR THE FOUR SPECIFIC STUDIES

3.6.1 Study I

Study I is an integrative literature review. Thus, it differs significantly from the three empirical studies (Studies II, III, and IV) in many respects, notably in the data sources. Study I uses only secondary data from research articles. As noted above, an integrative literature review includes empirical and theoretical literature with diverse methodologies in order to obtain a comprehensive understanding of a particular subject in which various opinions and perspectives are presented (Whittemore & Knafl 2005). For this thesis, the integrative review was used to search for the use of the agile concept at a strategic organizational level. Articles that related to narrow technical solutions were excluded. Articles had to define agile, or describe the enablers in the agile organization, to be included in the review. Sixty articles, published between 1994 and 2012, met these inclusion criteria. The articles derived from different research fields – from production logistics to knowledge management.

Qualitative content analysis was used to derive categories and themes based on an article search related to the research questions 1-3 (see Section 4.1) (Hsieh & Shannon 2005; Graneheim & Lundman 2004). For the definitions key terms were identified and categorized by their patterns of use using summative content analysis (Hsieh & Shannon 2005). These

patterns were classified into themes. The enablers were analysed by identifying relevant text with coherent content. Then these units of texts were sorted into categories and then into themes that identified the main characteristics of the enablers (Graneheim & Lundman 2004).

The thesis author and one of the article's co-authors discussed and refined the categories in a process informed by negotiated consensus (Bradley et al. 2007). The same procedure was used to identify relationships between the agile and lean concepts. These three questions were then synthesized in order to answer the last research question.

3.6.2 Study II

This case study was conducted at Hospital A. Data for the study were collected between January 2008 and October 2010. Hospital A was selected for this single case study because of the innovative change strategy in use.

Qualitative data were primarily collected in two interview rounds. In the first interview round in February 2009, interviews were conducted with the chief executive officer (CEO), the head of finance, the head physician, the head of marketing and communication, the assigned consultant, a development leader, and two department directors ($n = 8$). The purpose of these interviews was to acquire an understanding of the purpose and content of the strategic change.

In the second interview round in May and June 2009, structured focus group interviews with informants were conducted ($n = 47$). The purpose of these focus group interviews was to investigate the implementation of the strategic change in the departments. Other data analysed were documents that explained administrative plans and the work procedures for the operational plans (see Table 3).

All interviews were transcribed verbatim and analysed following basic content analysis coding methods influenced by Silverman (2006). Data from each interview were organized into categories for content, context, process, and outcome using QSR NVivo software 8.0. The Pettigrew and Whipp (1991) model for strategic change was used to interpret the study's findings as a holistic picture of the change.

3.6.3 Study III

This case study was conducted at Hospital B. Data for the study were collected between 2009 and 2012 (see Table 4). Interviews and observations were performed to understand how hospital managers understand lean and agile management strategies and how these could be applied and combined in their hospital.

The interviews were transcribed verbatim and read through several times to get a sense of the whole. Observation notes were summarized in text. Thereafter, text segments (from both interview transcripts and observations) that gave insight into the drivers, conceptualizations and outcomes of lean and agile were extracted and combined into one text, constituting the unit of analysis. Conventional content analysis as described by Hsieh and Shannon (2005) was used to inductively identify meaning units from the text, condense and label them, and finally group them into categories based on similarities and differences. Two researchers discussed and refined the categories in a process informed by negotiated consensus (Bradley et al. 2007).

3.6.4 Study IV

Study IV is an explanatory case study. Two case descriptions provided background data. One case was a retrospective description of historical milestones that preceded the adoption of the lean and agile management concepts (from 2004 to 2009). The other case was a description of contemporary key events for the strategic change (from 2009 to 2012). These two case descriptions contextualize the specific management activity of combining the lean and agile concepts.

An additional interview with the hospital CEO and the project leader for the lean and agile initiative provided data on how and why they rapidly responded to a temporary external demand for treatments not currently provided at the hospital. The interviews and the background data were summarized in a chronological case description. One informant reviewed the case descriptions for any misunderstandings or omitted information.

The explanation building pattern matching technique was used in the analytic model in this study. The research team identified and analysed key events, such as stakeholder actions and decisions, changes in the internal or external environment, new business opportunities, and the outcome of events. This discussion led to a consensus view of these events. Next the thesis author and two researchers met several times to identify the empirical patterns.

3.7 RESEARCHERS' ROLE

The research for this thesis may be described as an iterative, interactive, and collaborative process between researchers and practitioners. In both cases (Hospital A and Hospital B), the researchers (the thesis author and other researchers) presented their analyses (after completing each data collection batch) to hospital managers and employees. These feedback

sessions encouraged the practitioners to reflect on how the researchers' analyses might influence future actions.

At Hospital B, representatives from the various research teams presented empirical and theoretical research from the logistics and management literature. These presentations dealt with how to combine efficiency with change strategies using the management concepts known as "lean" and "agile". In addition, the researchers conducted discussion and learning seminars with hospital employees throughout the research period. During these seminars "on demand", knowledge was in focus as the researchers described their research experience and the literature relevant to Hospital B's change strategy. Besides generating discussion and reflection, the seminars produced suggestions for the next research step.

In studying innovative development and strategic change, it is useful to adopt a research design that is sensitive to a dynamic, complex, and unpredictable events (Van de Ven 1992). Making a significant change in strategy can be an organic and adaptive process. Hospital A and Hospital B adapted to the innovative changes, but the innovations also had to be adapted to their specific situations and settings. The researchers' role, then, was to present previous research experiences and relevant literature in a way that facilitated learning and reflection among the informants. The researchers were facilitating agents for change rather than active agents for change.

3.8 ETHICAL CONSIDERATIONS

In the application to the Stockholm Regional Ethical Review Board measures used to safeguard the integrity of interviewees and handling potential ethical problems were presented. The Board declared in an advisory statement that it had no objections to any aspect of the research.

4 FINDINGS

4.1 STUDY I

Study I had several purposes: (1) to acquire an in-depth understanding of agile organizations and its relation to lean management; (2) to situate agility in the health care setting; (3) to explore how these concepts/methods (adopted from non-hospital settings) apply to the hospital setting. Although the lean concept had been described in the literature on health care, the agile concept had not. With this in mind, the following research questions were formulated:

1. What is the definition of an agile organization?
2. How do enablers assist the agile organization?
3. How is the agile organization related to the lean organization?
4. Can a hospital become an agile organization?

Definitions

The definitions of the agile organization seem to follow two patterns: the external context of an organization and its characteristics; and the strategies the organization uses to manage its context.

Agility means using market knowledge and a virtual corporation to exploit profitable opportunities (example of coping strategies) in a volatile marketplace (example of external context) (Christopher & Towill 2001, p. 236).

Based on analysis of the literature, we concluded that the nature of change in the external context (i.e., the environment), can be described as very frequent, unpredictable, or turbulent. We conceptualized three coping strategies for this context as: reactive, proactive, or embracive. Each strategy differs from the others as far as its approach to the context. The reactive strategy means being prepared for the unpredictable/the uncertain. The proactive strategy means foreseeing and taking advantage of possible future situations. The embracive strategy means integrating with other external stakeholders (through trans-boundary actions) to reduce uncertainty.

Enablers

Five overarching themes relate to the enablers of agile organizations were identified.

1. *Transparent and transient inter-organizational links at all levels.* This theme emphasizes trust, interaction, and openness in addition to simple dissolution, as needed.

2. *Market sensitivity and customer focus.* This theme emphasizes the ability to sense and act on information from customers, society, rivals, and suppliers in real time. Market knowledge, mutual trust, and joint problem-solving are elements in this theme.

3. *Management by support for self-organizing employees.* This theme emphasizes the idea that management should function as “un-lockers” of employees’ agility skills and set general boundaries for work performance.

4. *Elastic and responsive organic structures.* This theme emphasizes decentralization, organizational informality, and teamwork in the agile organization.

5. *Flexible resource capacity and short life cycles.* This theme emphasizes making on-time deliveries and matching resources to demand with a buffer capacity.

The agile organization and the lean organization

Study I identify different underlying principles and focuses in the use of the lean and agile concepts. The agile organization has been described as the organization that prioritizes responsiveness and market orientation over efficiency. The lean organization has been described as the organization that prioritizes high efficiency over responsiveness. Furthermore, use of the lean concept is said to suit market conditions where reducing cost is the primary focus. Use of the agile concept is said to suit market conditions where availability is the primary focus. The agile concept is sometimes portrayed as either the “new paradigm” that follows the lean concept, the needed development on top of a lean base, or the complement to the lean concept in distinct hybrid strategies.

Agile hospital organization

The review identified no empirical studies on agile hospital organizations. Therefore, the extent to which agility is applicable in hospitals can only be discussed at a conceptual level. This finding suggests empirical research on agility at hospitals is needed. The review suggests that agile management of organizations might suit hospital organizations. By

defining levels of environmental uncertainty, reactive, proactive, and embracive strategies can be used to better manage the increasing turbulence in the hospital environment.

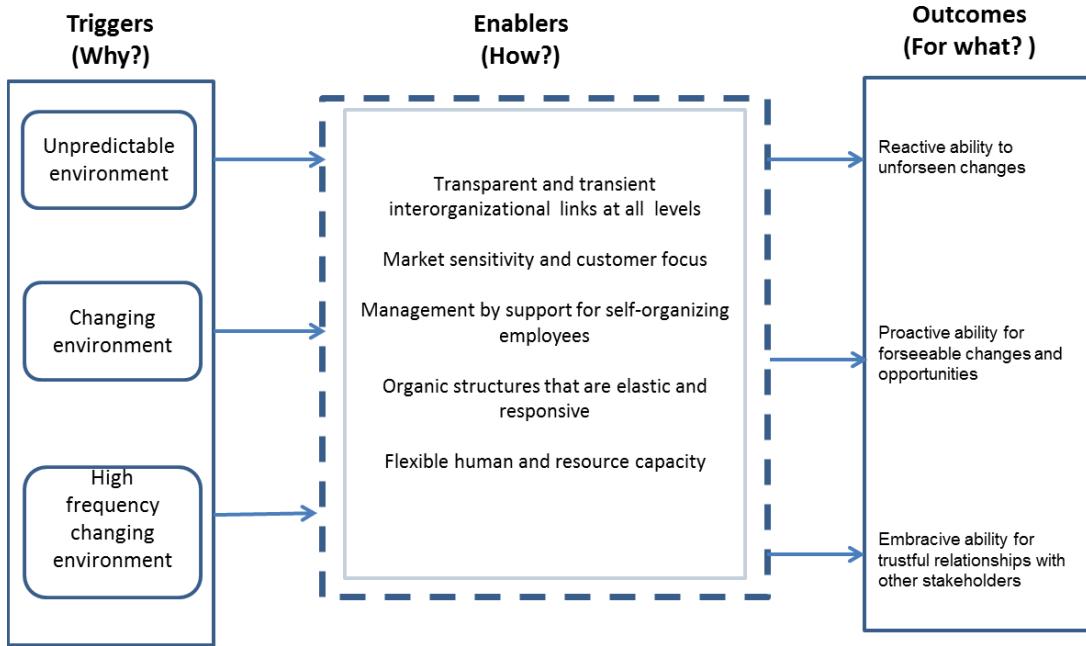


Figure 1: Overview of the findings from Study I

4.2 STUDY II

Study II explores why, for what, and how a strategic management group at Hospital A adopted a certain operational plan as a change strategy intended to reduce patient waiting times. The findings from this study are presented in line with Pettigrew and Whipp's model for strategic change, in relation to context, process, content, and outcome (Pettigrew & Whipp 1991) (see Section 3.4).

Context

Both internal and external context factors influence the hospital in the adoption of operational plans. External context factors relate to the pressure stemming from policymakers' demands that require greater transparency (e.g., via more comparisons and assessments) and impose a national policy on maximum patient waiting times for certain medical conditions and treatments. This change strategy is linked to competition, market adjustments, and greater patient-centred responses. Furthermore, cost-saving measures were identified as an important driver of the adoption of changes in operational plans and procedures.

The main internal context factor creating pressure relates to the hiring of the new CEO who wanted to change the organizational structure, the management strategies, and the follow-up

routines. An outside consultant, who was employed to implement the change, said the hospital's goals were too vague which led to managers in the various hospital departments having different understandings of the existing operational plans.

Content

The intention was to use the operational plans to clarify the hospital's goals, as well as organizational values, for all employees. By linking specific activities in each department to short-term operational goals and then to the hospital-wide goals, the operational plans were intended to be tools that aligned activities with goals. An individual was assigned to each operational activity and its short-term goal. These people took responsibility for performing the activities and achieving the goals. The idea, that each employee should be linked to the goals, was intended to activate staff in achieving the hospital's overall strategic vision. The change strategy also included a method for implementing the operational plans in the various departments.

Process

The consultant recommended structured methods for implementing the operational plans and procedures. The CEO charged a senior management team with defining goals and activities, implementing the operational plans, and forecasting how the rapidly evolving health care environment would affect the hospital in the next three years. An environmental scan was made with the intent of acquiring information about trends, events, etc. in the hospital's external environment. The management team used this scan to develop a three-year plan of goals and strategies that would reduce patient waiting times. The management team then began translating the plan into specific operational activities with measurable outcomes.

The ten department management teams created their own operational plans based on the management team's goals and strategies. The consultant acted as a facilitator for this work. Thereafter 140 unit managers formulated their individual challenges linked to the management team's goals and strategies. At this point operational plans were presented that described the operational work. Later the CEO and the project leader made follow-up visits to all departments to evaluate their operational plans.

Outcome

Several unit managers described the structured implementation process as essential for clarifying the operational plans. The department heads described their joint discussions (led by the consultant) on the operational plans as important. Others stated that selecting and

formulating goals that linked to activities in the departments was also useful. The focus on the individual employee was recognised as essential. Opinions on the operational plans were mixed. Some said these plans positively influenced the department work (e.g., plans related to patient waiting times, hygiene issues, and patient records) and increased people's knowledge of other departments' work.

However, some complained there was too much focus on production versus contextual reflection on employee and management-oriented goals. In addition, some employees had difficulty in modifying the plans to the specialized activities of their departments and in deciding which tasks should be prioritized.

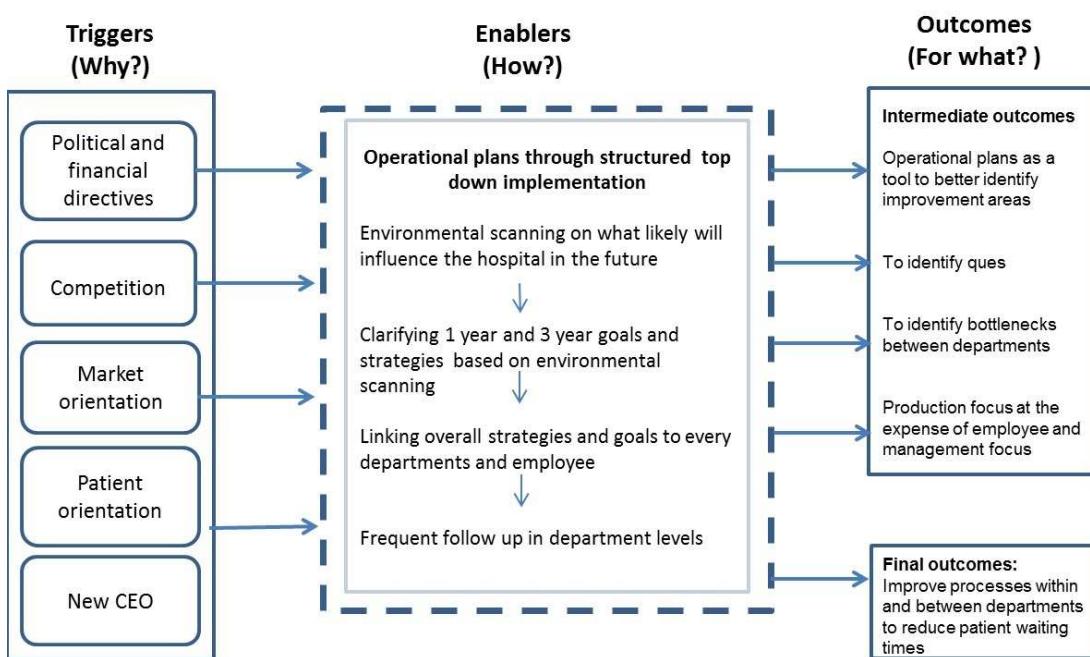


Figure 2: Overview of the findings from Study II

4.3 STUDY III

Study III addresses the following research questions: 1) Which drivers influence a hospital management group's decision to initiate a strategy to adopt both lean and agile strategies? 2) How does the management group conceptualize lean and agile strategies? and 3) Which outcomes does the management expect from combining agile and lean strategies in the hospital organization?

Drivers to adopt a lean and agile approach

The drivers motivate the management group's decision to adopt a lean and agile approach to the strategic change. The management group identified a number of drivers. One driver

related to the changing characteristics of the political directives. Hospital management was experiencing a turbulent period that related to regional political directives. Management saw several structural changes: established structures were removed and new structures were added. A second driver was the need to cut costs at the hospital. A third driver was the increase in competition from other health care providers that had improved their patient access processes. A fourth driver was the call for more use of evidence-based management in health care. A fifth driver was a perceived lack of ability to quickly react to current demands and strategic key indicators

Conceptualization of lean and agile strategies

The concept of agile was primarily understood as the ability of the hospital to make adaptations to its changing environment. An agile organization makes quick responses to changing environmental demands and requirements and skilfully manages *ad hoc* situations that are not anticipated. Furthermore, one member of the hospital management understood the concept of agile as the ability to alter/rearrange work activities depending on the patient flow. For example, during periods of low patient flow, development work could be performed; during periods of high patient flow, all effort should be directed towards patient care.

The concept of lean was understood as the ability of the hospital to perform its functions efficiently. Efficiency resulted from the standardization of care processes, elimination of unnecessary activities, and careful use of resources. In addition, lean should be used to spread workflows evenly, to the extent possible, and to coordinate workflows among units. Finally, the lean concept meant that processes should be planned and executed so that they meet patient needs.

Expected outcomes

A number of outcomes were expected. The overarching expected outcome of the strategic change initiative was that the hospital would become lean and agile. This was to be accomplished by creating efficient structures and preparing for sudden patient demands. It was also expected that the hospital could manage its financial problems in new and cost-effective ways. Part of that expected outcome was that other hospital resources (besides its financial resources) would be used more efficiently and wisely. Although our research revealed that the work of streamlining processes was already fairly established, it was clear more could be done. For example, systems and procedures should be examined on an ongoing basis, the overflow daily work (where possible) should be spread to other hospital areas, and the medical staff should work more harmoniously around the patients. Yet another

expected outcome was that the hospital would find a way to accommodate the patient more fully in the care process. This meant paying more attention to patient needs than to employee requests.

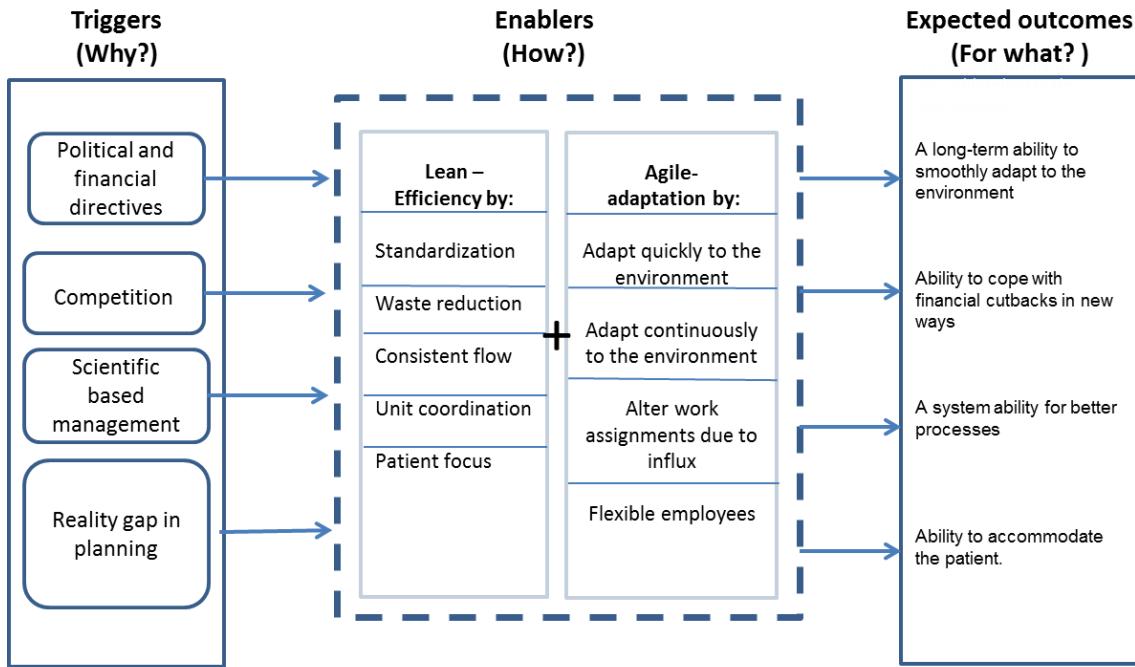


Figure 3: Overview of the findings from Study III

4.4 STUDY IV

Study IV identified and examined the mechanisms that enable the hospital's management to use the lean and agile concepts in practice. In this case study, the focus was a specific event that the researchers and practitioners thought reflected the principles of combining lean and agile strategies. The event was a sudden demand for treatment of benign prostatic hyperplasias (i.e., enlargement of the prostate) that another county council had put out for tender because of concerns with waiting times. This contract was for a type of care that the hospital did not currently provide.

Context

For a long period of time, the hospital's strategic management group had focused on developing systematic improvements in the workflow so that sudden increases in the demands for service could be managed internally. The hospital could demonstrate it had improved the efficiency of patient care. However, the county council was promoting the private provision of health care – creating an “internal market”. As a result, competition for

patients increased throughout the health care system at the same time that revenues decreased.

Concurrently, the hospital was encouraged to work with the “external markets”. This challenging (and political) environment posed challenges to the hospital’s existing management and production systems. The hospital’s strategic management group expressed that they realized the need for a strategic change that involved more than increasing efficiency.

Process

The strategic management group chose to focus on the “lean and agile” concepts. This group consisted of the CEO, the vice CEO, the department directors, and the financial and human resource managers. To begin, this group met to study the principles underpinning the concepts of lean and agile and what those concepts meant for hospital management and operational planning (see Study III). As the group continued to meet, trust and transparency were established. The members expressed they realized they could influence change at the hospital by adopting the lean and agile concepts as strategies.

Next the group presented its ideas at the operation level at three meetings. First line managers, physicians, and the union representatives attended these meetings. A series of actions followed that included mergers between clinics, a division of medical processes into themes, and the recruitment of people with process management knowledge. Yet, as the researchers observed, the concepts of lean and mean were still not widely understood by hospital staff.

The real meaning of combining the concepts of lean and agile in practice was revealed when the strategic management group encountered a sudden demand from the external market (another county council). Treatment was required for 150 patients with benign prostatic hyperplasias.

Content

The strategic management group began to investigate the conditions needed to handle this situation. In June, the group hired an experienced urologist to help with the analysis. In particular, they requested that the urologist examine whether the existing facilities for orthopaedic surgery at the hospital provided a sound base to introduce a new line of surgery - - urology. In mid-August, an individual was appointed to establish the medical criteria for a urology department. Several urologists and several nurses were employed.

After an intense discussion, it was agreed that the hospital would “own” the process. At the end of August, the other county council awarded Hospital B a contract for 150 urology operations for benign prostatic hyperplasia. This decision was presented to hospital managers. In addition to hiring the new employees, extra equipment was purchased. A meeting was held with all personnel, and an operational manager was appointed.

On the first of September, representatives from the hospital met with the other urology department. The purpose of the meeting was to resolve various uncertainties related to patient volume and treatment of medical complications. In the following days, compensations rates were discussed and an agreement was reached. Some procedures (e.g., administering anaesthesia) were revised, and information packets for patients were printed. The plan was that operations would be performed on weekends in order to avoid disruptions in the normal operating schedule. The first four patients were admitted on the ninth of September. The next day they had surgery, and three days later they were discharged.

Mechanisms

The findings of this study reveal that mechanism patterns enabled Hospital B to respond quickly to this sudden and new patient demand. These mechanisms were the following: strategic leadership in constant motion; a market orientation/expansion; deep experience with process development; a readiness for change (despite limited understanding of new concepts); a rapid transition capacity; and a flexible use of physical and human resources.

Outcome

The introduction of urologic surgery increased the scope of services provided at the hospital. As a result, revenues increased. The owner county council also placed an order for urology operations and an additional request for hand surgery. Furthermore, hospital management later responded to sudden medical demands from the international community (e.g. treatment of injuries sustained in war zones in Libya).

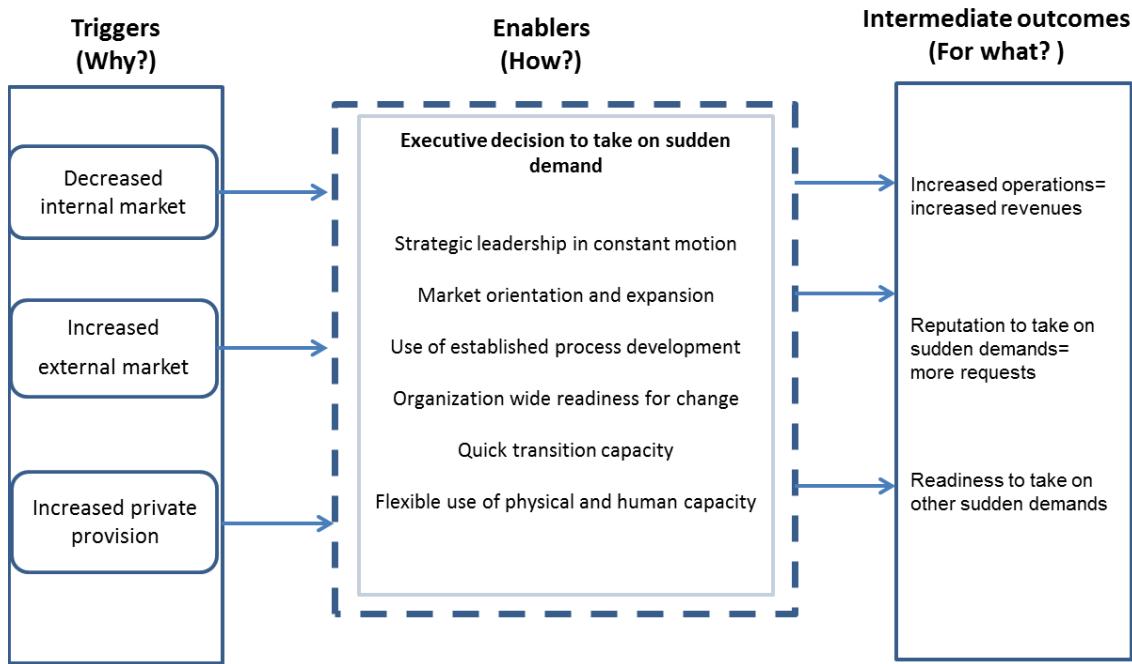


Figure 4: Overview of the findings from Study IV

5 DISCUSSION

The aim of this thesis is to increase our understanding of how lean management relates to agile management in hospitals. The research examines the differences in these two management concepts and considers how they can be combined in strategic management.

This thesis presents examples of why, how and for what the principles underlying lean and /or agile management are adopted in hospital settings. The focus is on two strategic hospital management teams' actions and their rationales for those actions combined with insights about the use of agile and lean management in non-health care settings. Insights from the four studies are summarized next.

Study I: Uncertainty, caused by the many changes and events in the external health care environment, is increasing for public health care systems that have introduced choice and competition. These changes and events call for the use of agile management strategies that are both “reactive” and “proactive”. Market sensitivity, customer focus, elastic and responsive organizational structures, and flexibility facilitate the use of the agile management strategy. This study finds the following possible relationships between agile management strategies and lean management strategies: a different paradigm, agility on top of a lean base, and hybrid strategies.

Study II: The political pressure for a patient-centred approach lies behind the focus on improving patient processes. The new CEO described the focus on a “no-wait-hospital”. The use of “operational plans” at various organizational levels to operationalize the goal created an aligned internal strategy. This strategy involved units and staff, leading to improved processes across organizational boundaries although with a narrow production focus.

Study III: The increasing turbulence in the hospital environment, created by rapidly changing political directives and market pressures, caused hospital management, already lean in its operations, to look for ways to increase its agility. Agility was conceptualised as the long-term ability to adapt to the environment and to cope with mandated budget cuts. Enablers were defined as the management's ability to continuously react to changes, to alter work assignments to accommodate changes in the influx of patients, and to recruit flexible employees.

Study IV: Hospital management used the agile management strategy when an opportunity to obtain a contract for specialized care arose. The hospital had not previously provided this care. Enablers were management's previous market orientation, the use of an established production process for the new patient group, an organization-wide readiness for change, a rapid transition capability, and the flexible use of physical and human resources. As a result, hospital revenues increased, hospital reputation improved because of its rapid response to sudden patient demand, and new service contracts were signed.

5.1 IS A LEAN AND AGILE HOSPITAL MANAGEMENT POSSIBLE?

Study I reveals that an agile organization can react positively to a changing environment by proactively anticipating future opportunities and taking advantage of them.

In the empirical cases described in Studies II, III, and IV (for Hospital A and Hospital B), the strategic management teams implemented organization-wide changes. The pressure for these changes was similar at both hospitals, but they responded differently. Hospital A chose a reactive strategy by scanning the environment and then formulating a general plan/vision. Once goals were set, Hospital A worked to achieve those goals following a structured, top-down management style. The hospital's general goals were aligned with the specific goals of every department and every staff member. Hospital B adopted a mix of reactive and proactive strategies by integrating its activities with those of other stakeholders and reconfiguring its resource base to increase revenues. As a result, the hospital managed to achieve financial stability.

When organizations address competition, they adopt strategies and make choices depending on their specific context (Hallgren & Olhager 2009). The two hospitals in focus addressed competition differently. Hospital A aligned its strategic goals with those of the departments by emphasizing inter-departmental efficiency and organization-wide efficiencies. Hospital B used internal and external resources in a way that supported its financial stability.

Abrahamsson and Brege's (2004) conceptualization of the dynamic capabilities that organizations require in taking new market positions is applicable to the hospitals of this study. With respect to effectiveness, Hospital A can be seen as static whereas Hospital B as dynamic. Static effectiveness describes how well an existing business is managed in a certain environment. According to the authors, static effectiveness is achieved by "optimizing the resources available in a given market situation and being updated on new techniques in order to perform more efficiently" (p. 101). This means that high static effectiveness is achieved by implementing an optimal combination of strategic and

operational activities in a static business environment. Abrahamsson and Brege argue that this often is (or was) the case in highly regulated markets, such as public health care. The development of products or services, which is fairly stable over time, is characterized by technological improvements rather than by market changes.

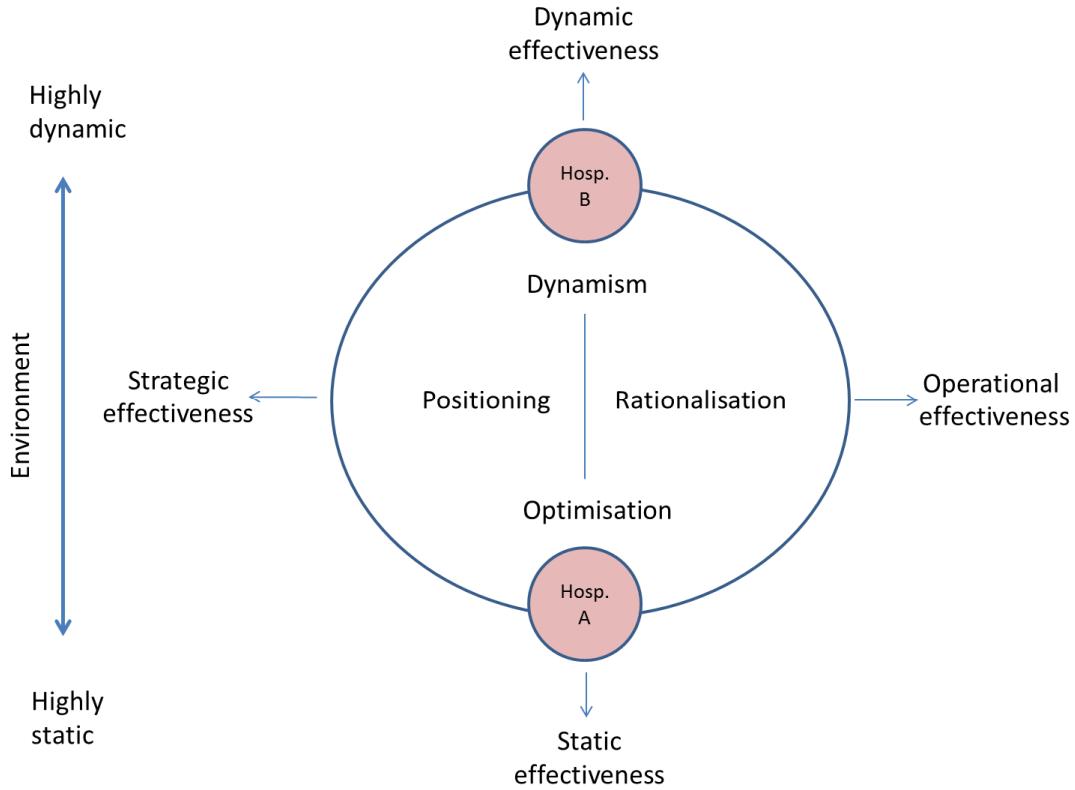


Figure 5: The conceptual model of the four dimensions of effectiveness (adapted from Abrahamsson & Brege, 2004)

However, if the environment is more dynamic due to market changes and increased competition, organizations compete by repositioning themselves quickly as they adapt to new demands faster than their competitors. Therefore, in a dynamic environment the interaction between the operational capabilities and the marketing strategies is of high value. According to Abrahamsson and Brege (2004, p. 84), dynamic effectiveness is defined as “how fast-and-well a company can go from one strategic positioning and productivity frontier to another”. The managers at Hospital B conceptualized their environment as dynamic (Study III). They reconfigured their existing resources to take advantage of new market opportunities (Study IV).

Organizations require dynamic capabilities in order to compete in mature and emerging markets (O'Reilly & Tushman 2008; Abrahamsson & Brege 2004). Organizations with such

capabilities demonstrate “timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competences” (Teece et al. 1997, p. 515). Abrahamsson and Brege (2004) emphasize that existing operational capabilities can expand using new marketing strategies and positioning to a high degree. In contrast to traditional theory that posits that strategies should influence operational structure and activities.

The managers at Hospital B can be seen as using their existing operational capabilities – their competences and resources – to respond to the sudden demand for a new patient service. Dynamic effectiveness in an organization requires that the operational resource base is highly efficient by functioning smoothly as it produces innovative products. Because it had worked with process improvement for a long time, Hospital B had developed its capability for creating and implementing efficient processes.

Hospital A’s response is in line with Goldman et al.’s (1994) description of a tactical response to market place pressures appropriate for the degree of freedom characteristic of the traditional health care system. Exhibiting sensitivity to environmental changes in the direct organizational domain is likely to have an influence. A hospital can be more or less prepared for the politicians’ new regulations on health care and the general public’s changed expectations about health care. This response aligns with the health care system that the political bodies control through performance measures. As Christensen et al. (2007, p. 11) write, a hospital’s external relationships are “dominated by its subordination to political leadership . . . it functions as a technical, neutral tool for political leaders”. Hospital A’s goal was to reduce patient waiting times. It was up to Hospital A to decide how to achieve this goal. A hospital that uses its resources and conducts its activities so as to meet patient demands in its environment has performed well (Tan & Liu 2014).

Hospital B, with more room for manoeuvre, had more freedom in conducting its activities. The hospital could search for ways to meet, if not exceed, the politicians’ demands for new services by collaborating with other health care providers (public and private). Hospital B could explore potential alternative markets in a periphery domain that reflected the strategic responses that Goldman et al. (1994) describe (See also Tan & Liu 2014; Winter 2003; O’Reilly & Tushman 2008).

A finding from Study I is that previous research suggests lean management may be a necessary foundation for agile organizations. The argument is that agile management adds

capabilities to a lean base and thus manages the environmental uncertainty that lean management does not (Vázquez-Bustelo & Avella 2006).

Studies III and IV, using empirical evidence, support this finding from Study I. Study III shows that several informants considered agile management a possible solution for handling the increasingly turbulent environment. They thought that working with process improvement in the form of lean alone was insufficient. Agile management was conceptualized as a strategy for responding continuously to the environment versus responding in an *ad hoc* manner as problems arose. As a hospital strategy, lean management focuses on responding to patients' needs. As a hospital strategy, agile management focuses on responding to external demands. Study IV shows that lean management was a precondition for agile management in the case of Hospital B. This means that an efficient (lean) resource base can be used to respond to unpredictable health care demands even when new services with limited life cycles are introduced.

However, in Study II the response to environmental pressures, in particular the faster access to care, was to improve processes (become lean). This improvement was achieved by streamlining inter-departmental processes and promoting organization-wide goals throughout Hospital A.

Hospital A's goal was to decrease patient waiting times through greater efficiency at both the organizational and departmental levels. According to intermediate evaluations of this process, this goal was achieved to some degree. Hospital B's goals were to increase efficiency in providing care and to increase flexibility in adapting to sudden changes. As Study IV found, Hospital B was partially successful in meeting these goals.

Table 5: Management responses to political and competitive pressures

	Hospital A	Hospital B
Goal	Efficiency and alignment	Flexibility and adaptability
Strategy	Lean	Lean & Agile
Environment	Requiring stability	Coping with turbulence
Management focus	Exploitation	Exploration

The responses by the two hospitals suggest their managers thought differently about how to respond to political and competitive pressures. Hospital A responded by making improvements to existing resources and services. Hospital B responded by using existing resources to create new services.

These two different responses reflect contemporary management research on the concepts of exploitation and exploration. Exploitation is about efficiency, control, discipline, execution, implementation, and continuous improvement of existing capabilities. Exploration is about flexibility, innovation, knowledge creation, and the discovery of new and future opportunities (O'Reilly & Tushman 2013; Adler 2013; March 1991).

Researchers in the field of organization science increasingly recognize that the combination of exploitation and exploration capabilities is a precondition for organizations' long-term success (O'Reilly & Tushman 2008). An organization must be able to combine exploitation and exploration if it is to compete -- in markets where efficiency, control, and incremental improvement are highly valued, *and* in markets where flexibility, autonomy, and experimentation are needed (O'Reilly 2013; March, 1991). The combination advances the capability for using existing assets (exploitation) and the capability for discovering future assets (exploration). This dual capability has been labelled "ambidexterity", a word originally used to describe the use of both the left hand and the right hand adroitly.

The concept of organizational ambidexterity assumes that an organization's long-term success depends on its ability to exploit its existing capabilities and simultaneously explore new capabilities. To succeed in the short- term, organizations must exploit their assets; to succeed in the long- term, organizations must explore new assets (O'Reilly & Tushman 2008). Another way to look at the two capabilities is the following: exploitation helps an organization do things right; exploration helps an organization do the right things.

Striking a reasonable balance between exploitation and exploration is essential for organizations. If an organization places too much emphasis on exploiting existing assets, it risks falling into a "competency trap" in which existing assets are merely refined for continued use. The trap is that the likelihood of discovering new opportunities diminishes. On the other hand, if an organization places too much emphasis on the exploration for new assets, it risks adopting alternatives that diminish the exploitation of existing assets (O'Reilly & Tushman 2008). Thus, both exploration and exploitation are essential for an organization. Yet they compete for scarce resources (March, 1991).

Organizations tend to favour exploitation because it is more closely associated with short-term success than exploration. Variances are avoided and costs are reduced if the organization favours exploitation (March 1991; Uotila et al. 2008). Eisenhardt and Martin (2000) label this phenomenon "efficiency drift". Unless there is a well-thought-out plan for the use of management strategies, exploitation is more often preferred to exploration

(O'Reilly & Tushman 2008). At Hospital B, for example, the greatest organizational benefit did not derive from the immediate treatment plan for benign prostatic hyperplasias. Instead, the subsequent increase in requests for patient treatment was a greater benefit because the hospital was encouraged to attempt similar innovations.

Established organizations have a tendency to focus on exploitation because it may produce short-term benefits. Yet, in the long run, these organizations risk obsolescence when market changes are introduced (March 1991).

Levinthal and March (1993, p. 105), who coined the concepts of exploration and exploitations, writes:

The basic problem confronting an organization is to engage in sufficient exploitation to ensure its current viability and, at the same time, devote enough energy to exploration to ensure its future viability.

At Hospital A, the unit managers emphasized the benefits of structurally aligning the departmental goals with the organizational goals. However, some managers described how the strong production focus meant there was less time for contextual reflection. This situation suggests that a strong focus on exploitation may diminish the likelihood of exploration (at least, for management personnel). Yet, considering the hospital's principal goal (reducing patient waiting times), the focus appears appropriate. The current major challenge in the immediate environment had to be addressed. The situation may relate to efficiency drift, referred to above.

At Hospital B, challenges were encountered when exploration and exploitation were combined. Early organization theorists claim an in-built paradox exists when an organization tries to be efficient and flexible at the same time. The reason for the paradox is that the two concepts require different designs – mechanic versus organic (Burns & Stalker 1961). Adler (2013) claims that when organizations attempt to compete on both dimensions at the same time, they can achieve at best only mediocre levels of performance with either dimension.

Various proposals on how to separate exploration and exploitation can be found in the literature on structural ambidexterity (O'Reilly, 2013). Structural ambidexterity separates exploitation and exploration into different structures, processes, or activities. Typical exploration activities occur in R&D and marketing departments. Typical exploitation activities occur in production departments. The role of strategic management then becomes to integrate and orchestrate the exploitative and explorative activities. This can be accomplished

by managing the strategic contradictions and differing logics through the visualization of a controlling set of values and goals (Smith et al. 2005; O'Reilly & Tushman 2008; O'Reilly & Tushman 2013).

Hospital B created different processes (at different places and times, with different personnel) for the urology treatments and the orthopaedic treatments. The hospital combined the exploitation and exploration activities to develop a temporary urology department. This was achieved by making use of efficient processes that the hospital had developed previously.

The well-developed exploitation activities provided the necessary base for the exploration activity. Hospital B thus leveraged existing assets and capabilities in a way that O'Reilly and Tushman (2013, p. 18) describe as moving “from the mature side of the business to gain competitive advantage in new areas”.

The strategic management team at Hospital B that orchestrated this structural ambidexterity encountered several challenges. Few studies explain how managers actually handle the interface between exploration and exploitation. However, the research for this thesis leads to the conclusion that leaders who can balance this sometimes-contradictory interface are best suited to manage such challenges.

Mechanisms enabling lean and agile hospital management

Study IV revealed the prerequisites for combining lean and agile management strategies (exploitation and exploration). An organization requires speed and flexibility in decision-making, a compelling and shared vision, and the ability to manage multiple internal and external alignments.

O'Reilly (2013) calls for more research on the leadership characteristics needed when boundary-crossing situations arise that require structural ambidexterity. Study I shows that leaders must be able to manage multiple alignments. This skill is an important agile capability featured in the identified theme *transparent and transient inter-organizational links at all levels* in Study I. Furthermore, Study I reveals the importance of interaction and collaboration with external stakeholders (e.g., customers, suppliers, and partners) in order to be competitive. Goldman et al. (1994) suggest that extensive collaboration by leaders in planning and sharing of knowledge and information with external stakeholders enables the organization to use the competencies and strengths of its network partners (Li et al. 2008; Maskell 2001).

Study IV exemplifies these ideas. When Hospital B initiated a temporary collaboration with other providers to meet a sudden and new demand, the partnership required constant interaction, communication, trust, and negotiation to avoid cross-purposes. Christopher (2000) refers to this sort of temporary alliance or network as an “extended enterprise”. When the three parties collaborated, as described in Study IV, they worked towards the same goal. They integrated their processes and pooled their resources across organizational boundaries. An agile organization enables transient alliances that can form and dissolve quickly as needed (Bottani 2009; van Hoek et al. 2001). Hospital B created such an alliance for a specific demand using its existing network.

Strategic flexibility may reflect the capability of *market sensitivity* (Study I). This is the capability to constantly sense and respond to external factors such as customers, suppliers, economic shifts, and regulatory changes (Yang & Liu 2012). As mentioned above, managers at Hospital A and Hospital B acknowledged that their resources should be invested in activities that scan the environment in order to identify and respond to these factors.

Management by support for self-organizing employees

Delegation of decision-making to employees allows them to synthesize information from the environment and then to respond to users’ needs. The role of managers is to create an environment that promotes knowledge at the core of the organization and that sets boundaries within which employees can self-organize (Meade & Sarkis 1999; Browaeys & Fisser 2012). Different manager/employee aptitudes are needed: creativity, flexibility, and reflection. Managers and employees must also communicate clearly, be open to self-education, be willing to make evaluations, and accept the need to solve challenging work problems (Vázquez-Bustelo & Avella 2006; Ribeiro & Fernandes 2010; Alves et al. 2012; Hormozi 2001; Helfrich et al. 2009).

Management support was a key feature at both hospitals. At Hospital A, employees helped create their operational plans that aligned with the organization-wide vision and goals. However, these structured operational plans were perceived to create a strong production focus that allowed little room for reflection and development. An overly specialized structure may limit employees’ ability to develop professional roles. According to Christensen et al. (2007), this limitation is not in the organization’s best interest. A suggestion at Hospital B was to work with development in periods of low patient flow. This, however, requires that such periods exist. That situation is rather rare in, everyday hospital life. Moreover, it is not easy for employees to switch between routine and non-routine tasks. Such individual

ambidexterity requires that employees are exceptionally skilful at self-organizing and self-management (Raisch et al. 2009; Browaeys & Fisser 2012; Yusuf et al. 2004).

6 METHODOLOGICAL CONSIDERATIONS

In this Section, I comment on the methodological choices I made in answering the research questions. I also discuss the implications these choices have with respect to the trustworthiness of the research.

For the integrative literature review (Study I), I used strategies that enhance rigour in integrative literature reviews (Whittemore & Knafl 2005).

As a framework for the discussion on the research quality (e.g., the trustworthiness of the three empirical studies (Studies II, III, and IV), I used Guba's (1981) assessment criteria.

6.1 INTEGRATIVE REVIEW (STUDY I)

Integrative review is a comprehensive review approach that permits the inclusion of both quantitative and qualitative studies. Integrative review is different from systematic review that commonly only includes experimental research studies. Integrative review also combines empirical and theoretical literature. This comprehensive approach contributes to a broader understanding of the phenomenon of interest and proposes a variety of perspectives on the same phenomenon (Whittemore & Knafl 2005).

However, the comprehensive approach in integrative review is challenging, complex, and risks “lack of rigour, inaccuracy, and bias” (Whittemore & Knafl 2005, p. 547). Explicit and systematic methods specific to undertaking an integrative review are needed to avoid errors. Whittemore and Knafl propose the following strategies to enhance rigour in integrative review: clear problem identification, well-defined literature search strategies, rigour in evaluating quality of data, and the use of thorough and unbiased interpretation of primary sources.

Clear problem identification requires a specific review purpose with well-defined variables of interest, both of which facilitate appropriate data extraction. By defining variables of interest as agile definitions, agile enablers, and agile related to lean data extraction was facilitated.

Well-defined literature search strategies avoid biased and incomplete searches in unsuitable databases. The initial search strategies for this thesis confirmed my suspicion that research on

agile is scarce in health care settings. The final search strategies therefore included multi-disciplinary research publications related to the concept of organizational agility. The reSEARCH journal database was suitable because it includes several of the most used scientific databases. Thus, computer databases, while efficient, have certain indexing limitations – not all studies meeting the search criteria are identified. Whittemore and Knafl (2005) therefore suggest using other approaches such as journal hand searches, networking, and searches of research registries. Study I did not use these approaches, which may be a research limitation.

A literature search should be well-documented. This means identifying search terms, databases used, and the inclusion and exclusion criteria. Study I reports all this information. A possible limitation in the integrative literature review of this thesis, however, is the exclusion criteria of project management and narrow technical solutions. Because the literature review of this thesis aimed at investigating agile at the organization-wide level, it excluded studies focused on agile *project* management. The inclusion of such studies might have enriched the review in terms of understanding the difference between agile project management and agile strategic management. Another limitation may be the exclusion of narrow technical solutions. Their inclusion might have increased our understanding of different perspectives on the concept of agile. Study I does not explain the reasons for excluding such studies.

Rigour in evaluating quality of data is complex in integrative review because such reviews cover several methodologies and include both empirical and theoretical studies. Each research design requires different quality criteria. There is no gold standard for how to calculate quality scores. In the integrative review for this thesis, all articles were peer reviewed. All articles appeared in scientific journals that have essentially the same quality criteria.

The use of thorough and unbiased interpretation of primary sources requires the use of systematic analytic methods. In the integrative review of this thesis, qualitative content analysis was used to derive categories related to the content of research questions 1-3 (see Section 4.1). The Nvivo 8.0 software was used to count (summative content analysis according to Hsieh and Shannon 2005) terms in definitions. Microsoft Excel was used to structure the analyses of enablers and agile in relation to lean. The thesis author and another researcher proposed the categories and developed the themes through negotiated consensus (Bradley et al. 2007). The tables and figure in Study I show how the categories of agile enablers and definitions increase transparency and the possibility for replication.

6.2 THE EMPIRICAL STUDIES (II, III, AND IV)

Guba (1981) suggests four criteria for the evaluation of qualitative research: credibility, transferability, dependability, and confirmability.

6.2.1 Credibility- To what degree do the research findings represent the truth/ what really happened?

Credibility concerns the degree of the researcher's certainty that the findings represent the "truth" in a specific inquiry and its context (Guba 1981). Strategies that increase credibility are prolonged engagement, persistent observation, peer debriefing, triangulation, and member checking, both during and after inquiry.

Prolonged engagement and persistent observation: The researchers for the empirical studies of this thesis spent considerable time with the informants. They used this time to gain an understanding of the context of the research (including the informants' world), to limit distortions that researcher presence might cause, and to create trust between researchers and informants. For both hospital cases, the thesis author and the other researchers met several times with the informants during a period of several years (Hospital A: two years; Hospital B: three years). These persistent observations resulted in the collection of longitudinal and repetitive data. The observations, which took place at meetings, feedback sessions, and conferences with the informants, also allowed the researchers to see which elements were critical. This intensive and long-term interaction meant the researchers could check perspectives and establish honest and open relationships with the informants. The researcher-informant trust established meant the informants were comfortable with sharing sensitive information (see Krefting 1991; Guba 1981).

Peer debriefing allows researchers to test and evaluate their findings. Frequent discussions of emergent findings with members from the two research teams (from different disciplines) for this study encouraged the development of various and nuanced interpretations. The findings were also reported and discussed in conferences with faculty members and practitioners involved in other projects on innovative change strategies.

Triangulation of research methods, data sources, and investigators was used in this research. This diversity in the research methodology facilitated confirming or refuting data collected. For Studies II and III, our interviews with different people (various managers and clinicians) provided different perspectives on the same phenomena.

The research for Study IV, however, would likely have benefitted if we had been able to obtain information from still other informants (e.g., personnel from Hospital B and

representatives from other stakeholders). Such information could have given us other perspectives on the phenomena. We admit this lack as a limitation of the research.

Member checking, both during and after inquiry, occurred in this research. We gave the informants the opportunity to check their interview transcriptions, to comment on the researchers' intermediate findings in feedback seminars, to review the case descriptions, and to check the time series of the events described.

6.2.2 Transferability- To what degree can the findings be applied in other contexts with other members?

Transferability deals with the degree to which the research findings are applicable to other contexts or to people in similar situations. The strategies used to increase transferability are theoretical/purposive sampling, collection of thick descriptive data, and development of thick data descriptions.

Theoretical/purposive sampling process should be “governed by emergent insights about what is important and relevant” (Guba 1981, p. 86) rather than seek to generalize to a population as in experimental research. To gain these insights, we used purposive sampling of management team members (primarily). Our assumption was that these people had relevant knowledge about the use of, and justification for, lean and/or agile management strategies at the two hospitals. Because several managers were interviewed on several occasions, we could test our emergent theories. The informants in Study II, who were “exposed” to the management strategies, were interviewed to maximize the range of information obtained. For Studies III and IV, information from additional informants (e.g. other stakeholders, clinical personnel, and patients) after their exposure to the lean and agile strategies would have increased our understanding. This lack may be a limitation of this research.

Collection of thick descriptive data is important for making comparisons of the specific context to other relevant contexts. For the transfer of research findings to other contexts, it is important that sending and receiving contexts fit. The various data sources and the various data collection methods for both hospital cases allowed us to collect thick descriptive data.

Development of thick data descriptions occurs when the data collection is completed. At this point, we prepared case descriptions for the two hospitals. Such descriptions help others to decide whether the context fits another context, and whether the research findings are transferable.

Although the specific facts of the two case studies are unique to the two hospitals, their contextual characteristics may have relevance for managers at other hospitals. Consequently, much effort was made to specify the contextual factors of importance, and to enable readers to evaluate the relevance of the case study's findings to their situation and circumstances. These transferability strategies increase the possibility of generalizing the findings. When such strategies are followed, a case study's findings may raise to a conceptual level from a purely factual level (Yin 2014).

6.2.3 Dependability- To what degree would someone else be able to replicate the research?

Dependability deals with the degree of research replication Guba (1981) compares dependability to reliability in the rationalistic paradigm that is frequently used in quantitative studies. In order to achieve reliability in research results, the research instrument must produce stable results (invariance). However, instability (variance) is inherent in qualitative studies. Reality is constantly changing. Thus, changing research conditions and a changing reality are unavoidable factors in attempts at research replication. Nevertheless if another researcher can repeat the work, even if the new findings differ from the original findings, the original research may still have the characteristic of dependability. The essential key is that the research shows consistency in how the findings were reached. Strategies to increase dependability are the use of overlapping methods (e.g., triangulation), stepwise replication, and establishment of an audit trail (Guba 1981).

Overlapping methods are used to “overcome invalidities in individual methods; two or more methods are teamed in such a way that the weakness of one is compensated by the strengths of another” (Guba 1981, p. 86). We used several research methods in our case studies of Hospital A and Hospital B. We examined archival documents to verify information from the interviews. Interviews with people about past events can be problematic; people often have difficulty remembering events clearly. For this reason, archival documents created near or at the time of actual events may provide more factually reliable information than interviews. These documents may also highlight similarities and differences in memories of events compared to formal representations. Observations also help researchers obtain information directly instead of relying on information filtered through personal recollections. We admit additional observations in our research could have supported our findings.

Stepwise replication concerns the frequent communications between researchers as they compare their emergent insights and decide on future steps. These communications should be documented. For our case study of Hospital B, we held frequent reconciliation meetings

(carefully documented) with members from the two research teams. For our case study of Hospital A, we held reconciliation meetings with researchers from the same research team. However, these insights were not compiled in holistic descriptions. We admit to this deficiency. Such descriptions might have made our method of analysis more transparent for readers.

Establishment of an audit trail refers to the creation of detailed descriptions of the research process (e.g., data collection methods, interview protocols, interview notes, and descriptions of analysis and interpretation). We used Pettigrew and Whipp's (1991) framework (see Section 3.4) to support consistency in the interviews using mainly semi-structured interview protocols (see Appendices A and B). We prepared tables that present overviews of how our data were collected (see Table 1 and Table 2).

6.2.4 Confirmability- To what degree were the findings based on the original views of the informants?

Confirmability refers to the verifiability of the research findings. Do the findings present the experiences and views recounted by the informants? Or do they represent the researchers' opinions, biases, and interpretations? Clearly, trustworthy research responds to the former question. Strategies to increase confirmability are triangulation and the practice of reflexivity (Guba 1981).

Triangulation of data sources, methods and investigators were used in the two hospital case studies. It was especially important that a team of researchers, rather than an individual researcher, analysed the data. For the case study of Hospital B, seven researchers from two disciplines interpreted the data. For the case study of Hospital A, four researchers from different scientific backgrounds (medical, psychological, logistics, and sociological) interpreted the data.

The *practice of reflexivity* refers, for example, to the researchers' underlying predispositions in conducting research (Shenton 2004). The concepts of lean and agile underpinned this entire research of this thesis. These concepts were always at the forefront in the collection and analysis of the research data. Other (possibly relevant) concepts were not addressed. However, the benefit of the single focus, given our research purpose, outweighed any benefit to be obtained from broadening the focus.

7 CONCLUSION

The findings of this thesis imply that lean and agile management strategies in combination have the potential to offer hospital managers better ways to cope with an external environment characterized by increased marketization, including competition and patient choice. The thesis suggests that lean management is a precondition for agile management. This means that an efficient and structured (lean) resource base can be used to enable capabilities of market orientation and market positioning capabilities (agile). However, when developing lean strategies as a precondition for agility, there is a risk of efficiency drift and a narrow production focus, making adjustments to changes in the external environment more challenging. Therefore, it is necessary to find an optimal balance between lean and agile activities that are adjusted to the characteristics of the health care environment.

To successfully combine lean and agile activities, managers need to exhibit certain ambidextrous and dynamic effective management capabilities. They need to become aware of and synergize information from external stakeholders, adapt rapidly to new market conditions using existing resource bases, collaborate with other stakeholders outside the organization, manage the contradictions in multiple stakeholder collaborations, and flexibly manage human and physical resources.

7.1 IMPLICATIONS FOR PRACTICE

This research may be of value to health care practitioners (managers, in particular) in the development of a combined lean and agile management strategy. They may find this research a useful guide in situations in which choice and competition create an unstable or turbulent health care environment. The following actions are recommended for health care organization managers who are interested in employing lean and agile principles:

- Pay attention to both internal and external conditions so that continuous actions may be taken that adapt and improve the organization;
- Develop a compelling strategy for the integration of lean and agile principles based on amidextrous and dynamic effective management capabilities as described above; and
- Exhibit a readiness to redeploy existing resources, thereby enabling rapid adaptation to changes in market conditions (e.g. sudden increases in patient demands).

7.2 FUTURE RESEARCH

Future research could expand the focus of this research by an exploration of the following questions:

- How do employees experience lean and agile management strategies? What are the possible effects on their working environment and well-being?
- How are patients' needs and preferences respected and/or considered when developing lean and agile management strategies?
- What are the implications of a wider adoption of lean and agile hospital management for the national health system (e.g., health care costs, equity, access to care, quality of care)?

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APPENDICES

7.3 APPENDIX A – INTERVIEW PROTOCOLS, HOSPITAL A

Intervjuguide sjukhus A Förstudie

Roll på sjukhuset och utvecklingsarbetet

Berätta om utvecklingsarbetet 2008

- Vad är det för spännande som hänt, värt att berätta?
- Kritiska/väsentliga händelser
- Vad har gjort? Vid sidan av V-plan?
-

Kontexten

- Initialt – förutsättningarna?
- Drivkrafter?
- Externt/internt
- Hur är de interna förutsättningarna för förändringar

Erfarenheter så långt?

- Processen
- Faktiska förändringar – ändrat sättet ni arbetar?
- Några effekter i organisationen?
- Vad har ni lärt er?
-

De stora utmaningarna framgent?

- Kärnfrågorna

Hur ser förändrings/implementeringsstrategin ut?

- Hur ska ni få allt detta att hända?
- Hur ser planen ut, V-planen/ytterligare
- Stödstruktur?

De bärande idéerna?

- Vad är nytt, innovativt – värt att berätta?
- Hur sitter allt ihop, logiken, ansatsen?

Tankar och förväntningar på Vinnvård

- Frågor av intresse
- Samverkansformer

Intervjumanual för fokusgruppintervjuer vid sjukhus A juni 2009

Intervjuseriens övergripande syfte är att kartlägga vilket genomslag sjukhusets övergripande strategiarbete haft på olika verksamhetsnivåer. Kartläggningen fokuserar på hur chefer har arbetat med att införliva verksamhetsplanerna vid sina respektive enheter.

Berörda chefer förutsättningsar i det löpande processarbetet uppmärksamas särskilt. Sammanlagt genomförs nio intervjuer med ett urval av chefer. Vid varje intervjug tillfälle medverkar 3-5 chefer från en och samma verksamhet. Tidsåtgången för varje intervju beräknas till två timmar och leds av två forskare. Intervjuerna bandas och transkriberas. Allt datamaterial hanteras anonymt. Efterföljande analys syftar till att identifiera skillnader och likheter mellan representerade grupper och verksamheter. Resultaten sammanfattas och presenteras för ledningen i augusti 2009 (vecka 35). Intervjumanualen struktureras i fem teman:**1. Sjukhusets övergripande strategi- och utvecklingsarbete – under 2008 har ett omfattande strategi- och utvecklingsarbete genomförts med övergripande målsättningar om ”Köfritt sjukhus 2010” och ”Topprankat sjukhus 2011”**

- Hur ser ni på sjukhusledningens strategiarbete? (öppen fråga)
 - Beskriv hur strategiarbetet har genomförts? (process)
 - Varför har strategiarbetet genomförts? (fokus på syftet)
 - Vilka är era erfarenheter av strategiarbetet? (öppen fråga)
 - Anser ni att målsättningarna är realistiska? (innehåll)

2. Från övergripande målsättningar till klinikernas verksamhetsplaner – som ett led i strategi- och utvecklingsarbetet har de aktuella målsättningarna översatts till verksamhetsplaner (2008)

- Hur ser ni på översättningen av sjukhusets strategier i verksamhetsplaner? (öppen fråga)
 - I vilken utsträckning anser ni att målsättningarna är översättningsbara? (innehåll)
 - Hur har ni organiserat och genomfört översättningsarbetet till verksamhetsplaner? (process)

3. Implementering av verksamhetsplaner 2009

- Hur ser Ni på arbetet med att omsätta verksamhetsplanerna i ert dagliga arbete? (öppen fråga)
 - Är målsättningarna realistiska och genomförbara? (innehåll)
 - Är målsättningarna relevanta för enheten? (lokal kontext) För sjukhuset? (extern kontext)
 - Hur har ni organiserat arbetet med att införliva verksamhetsplanerna vid er enhet? (process)

4. Resultat av verksamhetsplaner – vilka resultat kan idag kopplas till det lokala arbetet med att utveckla verksamhetsplanerna och sjukhusets övergripande strategi- och utvecklingsarbete

- Hur har verksamhetsplanerna påverkat er enhet? (öppen fråga)
 - Har planerna bidragit till några nya aktiviteter? (resultat¹)
 - Har planerna bidragit till att stärka befintliga (redan påbörjade) aktiviteter? (resultat²)
 - Har planerna bidragit till att stärka enhetens rutiner för processutveckling? (resultat³)
 - Har planerna bidragit till resultat utanför enheten? (resultat⁴)

5. Det fortsatta processarbetet – chefernas förutsättningar att driva och stärka strategi- och utvecklingsarbetet vidare

– I vilken utsträckning anser ni er ha förutsättningar att omsätta aktuella verksamhetsplaner i praktiken?
(öppen fråga)

- Hur ser era förutsättningar ut? (öppen fråga)
- Behov av ytterligare ledningsstöd, ekonomi, kvalitet, medarbetare? (organisation)
- Behov av ny kunskap, förståelse, trygghet, engagemang/motivation? (individ)
- Vilken roll har du som chef i utvecklingsarbetet?
- Vilka särskilda utmaningar (och stödbehov) ser ni i det fortsatta utvecklingsarbetet?

7.4 APPENDIX B – INTERVIEW PROTOCOLS, HOSPITAL B

Intervjumanual ledning sjukhus A

Tack för att du ställer upp på denna intervju.

Intervjuseriens syfte är att kartlägga viktiga milstolpar i X utvecklingsarbete mot lean och agile under året 2011.

Intervjun kommer att spelas in och sedan transkriberas, om önskas kan jag skicka den utskrivna intervjun för påseende. Sedan kommer en innehållsanalys göras av materialet och analyseras utifrån relevant teori. En sammanställning i form av en fallbeskrivning kommer er tillhanda, med citat.

Vill du ha det transkriberade materialet för påseende? Ni har då möjlighet att ge feedback på denna.

Innan vi färdigställer en rapport har vi som regel att alltid skicka materialet till våra intervjupersoner och självklart kommer du att få ta del av och godkänna redovisningen av den här intervjun. Så tex inget har tagit ur sitt sammanhang.

Intervjun beräknas ta 1 timme.

Den största delen av intervjun går ut på att jag ber dig placera ut viktiga milstolpar i sjukhusets utvecklingsarbete mot lean och agile. En milstolpe kan vara allt från ett viktigt politiskt beslut, ett ledningsmöte eller en aktivitet/intervention på sjukhus eller verksamhetsnivå. Det viktiga är att milstolpen har haft betydelse för arbetet med antingen lean eller agile eller båda.

Innan vi går in på milstolparna har jag dock ett par inledande frågor som har koppling till de tidigare intervjuer jag har gjort.

DEL 1: Inledande frågor

Syfte o betydelse: Förra året beskrevs syftet med utvecklingsarbetet lean och agile bland annat vara att skapa en hållbar struktur för att sjukhuset ska kunna hantera omställningar på ett smidigt sätt men också att bedriva utvecklingsarbete med vetenskaplig grund.

- *Vilken status har dessa syften idag?*
- *Vad betyder begreppen lean och agile för sjukhuset idag?*

Mål: Förra året beskrevs målet med utvecklingsarbetet att man skulle utgå från patientens behov genom att vårdpersonal skulle ha ökad insikt i patientens hela vårdprocess.

- *Vilken status har detta mål idag?*

I tidigare intervjuer beskrev ledningen att ett mål var att arbeta för en starkare koppling mellan stab och verksamhet.

- *Hur har det prioriterats?*
- *Hur har du märkt av det?*

En tredje målsättning var att investera i kompetensutveckling.

- *Hur har det utvecklats?*

Nästa frågar handlar om några tidigare strategiska satsningar:

Möllegruppen har beskrivits i tidigare intervjuer som en grupp med ett antal nyckelpersoner som skulle vara med att driva utvecklingsarbetet på strategisk nivå.

- *Vilken status har X-gruppen idag?*

Under 2010 introducerades arbetet med en organisationsmodell som kallades **dubbelmatrisen**. En modell som syftade till att skapa en mer enhetlig bild av patientens behov.

- *Hur har arbetet med dubbelmatrisen utvecklats?*

Under 2010 anställdes en ledningsassistent. Det fanns då tankar på att anställa flera stödfunktioner ute i verksamheten.

- *Vilka stödfunktioner finns för lean och agile idag?*

Under våren 2011 fanns det planer på att utveckla en verksamhetsöverenskommelse också kallad ledningsöverenskommelse för att förbättra dialog om resultat, kvalitet och ekonomi.

- *Vilken status har överenskommelsen idag?*

DEL 2

Nu lämnar jag mina uppföljande frågor och går in på det som handlar om att identifiera milstolpar under 2011. En milstolpe kan vara allt från ett viktigt politiskt beslut, ett ledningsmöte eller en aktivitet eller intervention på sjukhuset. Det viktiga är att milstolpen har haft betydelse för arbetet med antingen lean eller agile eller båda.

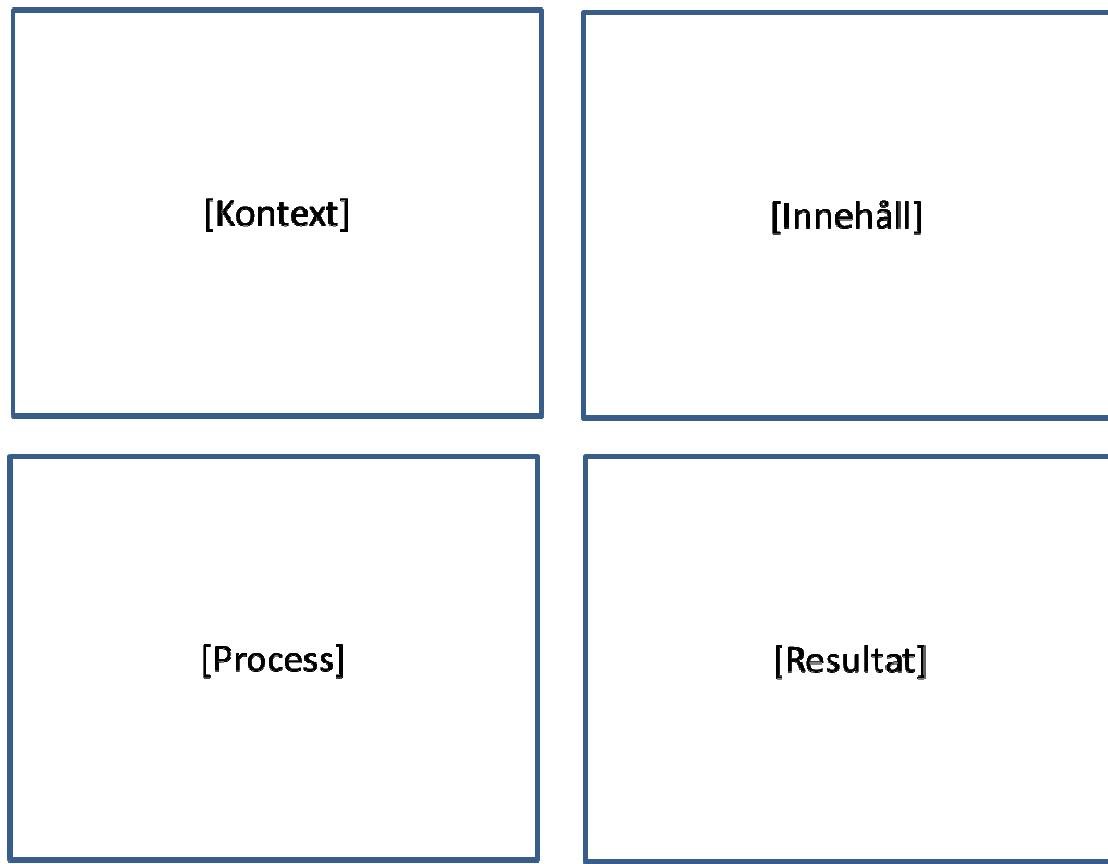
För varje milstolpe kommer jag att ställa ett antal frågor. Frågorna grundar sig på den analysmodell som vi på MMC använder oss av för att få en så bra helhetsbild som möjligt. Den fokuserar på : innehåll, process, kontext och resultat. Vi är alltså intresserade av vad man har gjort men också hur man har implementerat något och hur omgivningen har påverkat det samt vilka effekter det har fått för sjukhuset (Visa analysmodellen).

Vilken är den första milstolpe som du vill nämna?

- Bidrog det till? (resultat)
- Var det tillräckligt? Varför? (kontext)
- Kan du ge exempel? (innehåll)
- Vem gjorde vad? Nyckelaktörer? Hur gjorde man det? När gjorde man det?

Vilken är den andra milstolpen?

Milstolpar Lean och Agile i sjukhus B 2011



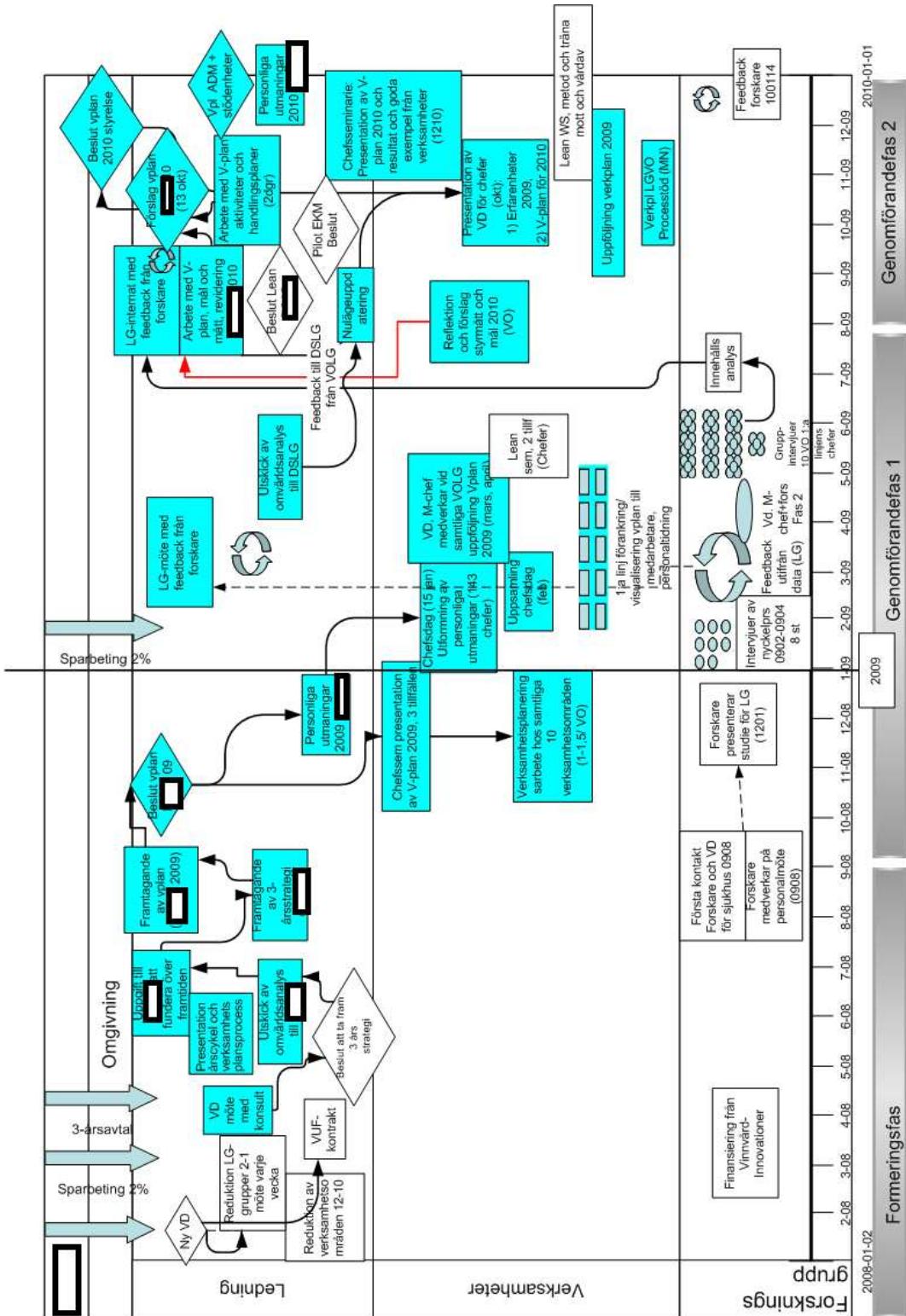
MMC:s analysmodell, (Pettigrew & Whipp, 1993).

Intervjumanual ledningen för sjukhus B 2004-idag

[Identifiera milstolpar]

2004 _____ idag

7.5 APPENDIX C – TIME SERIES, HOSPITAL A



7.6 APPENDIX D – TIME SERIES, HOSPITAL B

