CHALMERS
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Transition in healthcare systems

A journey across unknown waters

Master's thesis in Quality and Operations Management

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Transitions in healthcare systems
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Swedish healthcare has in a disproportionate way invested more effort and focus on emergency and specialist care compared to primary care, leading to long queues to hospitals. This has led to primary care being undersized and unable to be the first point of contact. The separation, not only in expectations, but also in main providers, has resulted in a fragmented lack of cooperation, creating a healthcare system in which both patients and providers find difficult to navigate in.

In recent years, Sweden has experienced a shift in demographics. The population is increasing in age, which has brought more cases of patients with multiple, long-lasting chronical illnesses, and patients in need of prolonged care from multiple actors. The lack of accompanying structures, cultures and practices that support this, as well as an absence of good cooperation between different main providers, results in a system that is incapable of good quality care throughout a patient's lifetime. As the population of patients will increase in time, this will create a bigger dilemma for the future.

In March of 2017, the Swedish government appointed Anna Nergårdh to lead an inquiry named “Coordinated development for good quality, local healthcare” in which the assignment was to propose how to conduct a restructuring of the Swedish healthcare system. Founded in this inquiry, Chalmers University of Technology started an initiative called “Moving Healthcare Home”. This arena purposefully is working towards a shift in the healthcare system, using cooperation inter-organizationally as their main success factor.

This thesis strives to examine if transition management methods and tools are applicable within Swedish healthcare. This was done by testing the transition management methods in the existing arena of Moving Healthcare Home. In addition, this thesis has examined if current innovation projects within said arena could be transitioned into transition experiments to help the shift to happen.

The thesis resulted in finding high potential in the arena and its projects to apply transition management methods, though needing both guidance and effort to reach said goals.

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Keywords: *transition management, system innovation, healthcare, transition experiments, backcasting methods.*

Acknowledgements

We would like to express our gratitude towards Andreas Hellström, the supervisor for this project, who guided us throughout the research, from start to end. Further, we would like to thank all the members of the collaboration arena of Moving Healthcare Home, as well as project representatives of Autumn Leaves and Person-Centered Mobile X-Ray for giving us the opportunity to interview them. Without their input our thesis would not exist.

Lastly, a special thanks to Professor John Holmberg and Johan Holmén whose assistance was greatly appreciated when we were lost in what direction to take.

Thank you all for believing and supporting us!

Robin Halfvordsson and Jasmine Johansson
Gothenburg, January 2022

“The first rule of an expedition is that everybody should stick together.”

Tahir Shah (2002)

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Acronyms

CHI – Chalmers Center for Healthcare Improvement
CIIST – Chalmers Initiative for Innovation Sustainability Transitions
CVA – Chalmers Center for Healthcare Architecture
HSL – Hälso- och Sjukvårdslagen (Swedish Healthcare and Medical Service Act)
GQLH – Good Quality, Local Healthcare (God, Nära Vård)
MHH – Moving Healthcare Home (När Vården Flyttar Hem)
MLP – Multi-Level Perspective
SKR – Sveriges Kommuner och Regioner (Swedish Municipalities and Regions)
SoL – Socialtjänstlagen (Swedish Social Service Act)
VGR – Västra Götalandsregionen

1. Introduction

This chapter contains background information in relation to the research topic, as well as the purpose of the project. Further, this chapter will mention the three research questions that will be answered by the end of the paper.

1.1 Background

The Swedish healthcare system is currently undergoing a transition spurred on by deliberate efforts both at a national level and the regional level. At the national level, the Swedish government deliberately sought out to guide the transition via appointing an inquiry named "Coordinated development for good quality, local health care (S 2017:01)" where the final delivery of the inquiry was "Good Quality, Local Healthcare - reform for a sustainable health care system" (Swedish Government Official Reports (SOU) 2021b; Good Quality, Local Healthcare (SOU 2020:19) 2021). The term "Good Quality, Local Healthcare (God och nära vård, GQLH)" has become widely used as an umbrella term synonymous for the healthcare transition and not exclusively to the reform (Regeringen 2021). This section will therefore start with an overview of background and important conclusions of the reform.

The transition towards a sustainable healthcare system in Sweden is disseminated throughout regions in Sweden where local adaptations to national directives are required (Good Quality, Local Healthcare (SOU 2020:19) 2021). Subsequently, this thesis case study is specifically targeted towards the Region Västra Götaland and Gothenburg Municipality. In this local area, Chalmers University of Technology has started an initiative with local health care providers called "När vården flyttar hem (Moving health care home)" (Malmstedt 2021). The central outlook of this initiative takes inspiration from the national reform towards a sustainable transition in Swedish healthcare.

Transition studies, and specifically sustainable transitions, is an emerging field of research which has risen to prominence exponentially in scientific peer-reviewed literature over the last decade (Köhler et al 2019). Today's society rapidly faces fundamental challenges in numerous domains such as energy, mobility, agriculture, and healthcare (van den Bosch 2010). These challenges are largely caused and accelerated due to environmental problems which primarily include climate change, loss of biodiversity and resource depletion (Köhler et al 2019). Due to these rising concerns, transition studies aim at studying, promoting, and governing a transition towards sustainability as a way to address and hopefully mitigate dire consequences of said concerns (Markard, Raven & Truffer 2012).

van den Bosch (2010) mentioned one example of transition management within healthcare, however, most literature that can be found on transition management is normally within energy systems and transportation. Therefore, it could be of interest to apply transition management tools within the upcoming reform of Swedish healthcare, both academically but also in a try to progress towards a more sustainable healthcare system.

1.2 Purpose

This thesis report strives to research if transition management methods and tools are applicable within healthcare, and how Swedish healthcare (specifically in Region Västra Götaland) could use them to shift into a more modern healthcare system. This will be done by testing the methods in an existing arena working with the transition in healthcare. This arena was started by Chalmers and has an initiative called Moving Healthcare Home (MHH). In addition, this thesis will examine if current innovation projects within said arena can be transitioned into transition experiments to help the shift to happen.

1.3 Research Questions

The inquiry of GQLH has made a list of specific success factors and obstacles for Swedish healthcare in relation to the coming transition. It would therefore be interesting if the members of the arena, who work within the healthcare system, have similar views or if they would differ. Therefore, the first research question is:
1. What are the main success factors and obstacles within Swedish healthcare in Region Västra Götaland?

Transition management has historically been used in the energy- or transportation sector and is a relatively new management framework. It is especially novel in Swedish healthcare. Therefore, the second research question is:
2. How could transition management be applicable in Swedish healthcare, specifically within the initiative of 'Moving Healthcare Home'?

MHH and its actors have a few ongoing projects. However, innovation projects differ from transition experiments. If the projects aim to make change within the transition it could be interesting to examine their potential in becoming transition experiments instead. Therefore, the last research question is:
3. How can the projects within the arena become transition experiments?

1.4 Limitations and delimitations

This thesis is focusing strictly on transition management and tools within this framework. There are countless management methods and ideologies, however this thesis will not compare or include any other framework. Within transition management, there are several tools and methods to use, and transition experiments and backcasting are a few of those. As there are constrictions in time, this thesis will only focus on said methods, as they fitted well with the time (the arena had just started up when this project began) and would help the arena in finding their purpose for future cooperation.

Lastly, when sampling, the research chose to examine the members of the arena. As the arena did not have any private healthcare actors involved, the research is not including their view.

2. Theoretical background and framework

This section presents the theoretical background on transition studies and two sub-fields. Transition dynamics, which concerns the fundamental understanding of how transitions come about and how they can be recognized. Transition management is a governance approach to influencing transitions towards sustainable directions. The theoretical section serves as the basis for method development and discussion. The section is rather extensive because an ulterior motive of the thesis is to hypothesize about a new management perspective in Swedish healthcare.

2.1 Transition studies

Transition studies, and specifically sustainable transitions, is an emerging field of research which has risen to prominence exponentially in scientific peer-reviewed literature over the last decade (Köhler et al 2019). Today's society rapidly faces fundamental challenges in numerous domains such as energy, mobility, agriculture, and healthcare (van den Bosch 2010). These challenges are largely caused and accelerated due to environmental problems which primarily include climate change, loss of biodiversity and resource depletion (Köhler et al 2019). Due to these rising concerns, transition studies aim at studying, promoting, and governing a transition towards sustainability as a way to address and hopefully mitigating dire consequences of said concerns (Markard, Raven & Truffer 2012).

Transitions can be understood in terms of a social change that transcends the current dominant thinking in how society fulfills a certain societal need (e.g., conducting healthcare, transportation of goods and humans) (van den Bosch 2010). Markard, Raven and Truffer (2012) argues that transitions are therefore described at the level of socio-technical systems, which is comprised of networks of actors (individuals, companies, collective actors, non-governmental organizations, and other organizations) and institutions (societal and technical norms, regulations, standards of practice). Socio-technical systems, as defined by networks of actors and institutions, are not constrained in a single dimension. Re-thinking a fundamental shift in the fulfillment of a societal need by a socio-technical system requires one to conceptualize the transition among multiple dimensions. These include technological, material, organizational, political, economic, institutional, and socio-cultural dimensions. Therefore, to illustrate the complexity, novel technological advancements such as digitalization in the health care sector which introduces a new perspective on how to deliver care and monitor patients, is not characterized as a transition on its own. Transitions carry far more broader implications at multiple scales, ranging from technological niches in healthcare development to public perceptions of the healthcare sector which inevitably influences national and regional politics. Socio-technical transitions differ from technological transitions because they include changes in user practices and institutional structures in coherence with a technological transition (Markard, Raven & Truffer 2012). Similarly, Loorbach (2007) defines transition processes at the level of socio-technical systems to occur when structures, practices and cultures are structurally altered in favor of new ones. van den Bosch (2010) further describes structures, practices and cultures as following:

- *Structure:* changes in structures are conducted along three dimensions: physically, institutionally, or economically. A physical structure represents capital vested in infrastructure (e.g., buildings, roads, train tracks, electrical grid), technological (machines, software, databases), resources and materials. Institutional structures are the immaterial fabric of a society, such as the judicial system (e.g., rules, regulations, laws), power hierarchies and structures and collective actors acting in various organizational forms. Lastly, economic structures are economical (e.g., behavioral patterns in consumption and market regulation of the production of goods and services) and financial (e.g., financial market instruments which include lending and borrowing funds) systems.
- *Practices:* changes in practices address how actors conduct their work and how they behave on a concrete level. In the socio-technical system it is referred to as the sum of activities which comprises routines, behaviors, implementation and so forth. The level of analysis can vary from individuals (e.g., change in behavior when conducting a task) to a more aggregated level where collective efforts are needed (e.g., coordinating tasks).
- *Culture:* changes in cultural norms require a shift in individuals' perceptions and mental models. Culture (notoriously hard to define) can loosely be described as the sum of social behavioral patterns, norms, beliefs, values.

Transition studies have broadly two main subfields in which the research is directed towards (van den Bosch 2010). The first one, which will be described in the subsequent section, takes aim at capturing and developing fundamental knowledge about transition dynamics. Specifically, the transition dynamic processes in past, present and future transitions (van den Bosch 2010). The other subfield comes from a more pragmatic standpoint and introduces the transition concept in sustainable development and governance. The belief is that through understanding structural transitions in socio-technical systems it is possible to construct governing principles which could influence the direction of a transition. This subfield is called transition management and concerns both the development of practical and theoretical knowledge that could aid in influencing transition towards sustainability (Loorbach 2007; van den Bosch 2010).

2.2 Transition dynamics

The field of transition dynamics is concerned with the fundamental understanding of transitions. Transitions were earlier defined when a socio-technical system changes its structure, practices, and cultures in light of fulfilling a societal need. This alteration of fundamental change is typically not sudden, and it is a continuous process over at least one generation, (~25 years) which implies that transitions need to be studied with a multi-temporal approach (Loorbach 2007). Rotmans et al. (2000) argued that the understanding of transition dynamics needs to consider this temporal component of a transition which leads into one of the main analytical tools for studying transitions, namely the multi-phase concept. Transitions are typically exhibiting non-linear behaviors and the general assumption is that the socio-technical system goes through long periods of dynamic stabilizations where the system is not particularly

threatened and therefore it strives after optimization (Rotmans et al. 2000). However, as no socio-technical system is stable for eternity, the period of stabilization is disrupted with a short period of aggressive structural change (Loorbach 2007). The multi-phase perspective on transitions with periods of aggressive structural change can be illustrated in the figure 1 below (Rotmans et al. 2000).

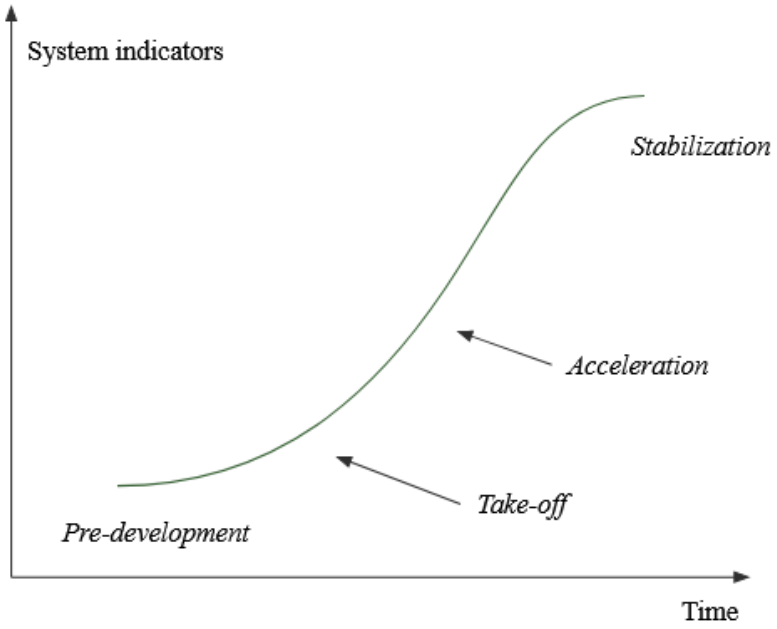

Figure 1: Multi-phase concept (Rotmans et al. 2000)

A transition is characterized to go through four phases, represented by an S-curve, the multi-phase concept bears a loose resemblance to the S-curve, often visualized in product development and innovation (Brown 1992). In fact, the S-curve in the multi-phase concept is the aggregate result of interacting system innovations, which is the result of product- and process innovation at the sub-system level (more on this later) (Loorbach 2007). The vertical axis typically indicates the performance of a system indicator, where the horizontal axis is the time period in which the transition is studied. A transition is said to undergo four phases of development (Loorbach 2007; Rotmans et al 2000; van den Bosch 2010):

- *The pre-development phase* where structural change in a socio-technical system is not noticeable and the system is still under a dynamic equilibrium.
- *The take-off phase* where the structural change in the socio-technical system is not yet visible, but systems and actors are beginning to mobilize for the process of change.
- *The acceleration phase* where visible changes in physical, economical, and institutional structures starts to emerge in the socio-technical system. This speed of change accelerates, and structures react to, and reinforce each other, and during this phase there are learning processes, diffusion and embedding processes.
- *The last stabilization phase* is where the speed of changes in the socio-technical system decreases and a new state of dynamic equilibrium of the system is reached.

Historical transition phases, patterns and patterns in transition studies can be mathematically modelled in order to develop a greater understanding in how agents and system interactions influence a pathway for transitions (Bergman et al. 2008). The S-curve, however, is primarily used as a descriptive model to reflect upon possible transition dynamics, and its core message is that transition processes are not gradual or linear. Long-term structural change is to be expected if certain prerequisites or circumstances are fulfilled, which highlights the importance of strategically, tactically, operationally, and cognitively being able to deal with non-linearity and unpredictability (Loorbach 2007).

To develop an understanding of transitions one needs to equip themselves with a multi-temporal approach as the previous paragraphs suggests. However, transition studies are rather distinct in the use of socio-technical systems as its main unit of analysis which differs from long-standing debates in sustainability where macro-developments (e.g., capitalistic consumption behaviors, nature-society interactions) are emphasized. Therefore, besides the multi-temporal approach, transition studies distinguish further characteristics of sustainable transitions in its field (Köhler et al 2019). Socio-technical systems are multi-dimensionality (e.g., technologies, markets, politics) and therefore transitions along multiple dimensions show co-evolutionary behaviors. Transitions are also multi-actor processes with actors and social groups (e.g., academics, politicians, user groups, lobbyists, professionals, activists, civil servants, and many more) in the socio-technical system. As multiple actors are engaged and enable transitions, a transition quickly becomes a complicated process where autonomous behavior is enacted from many (sometimes seemingly unrelated) positions towards the transition (e.g., making investments, strategic calculations, learning, power conflicts, political disagreement and disruption, creation of alliances) (Köhler et al. 2019).

One powerful analytical tool in understanding historical transition and for industries at large is the multi-level perspective (MLP) (Geels 2002; 2006). MLP combines ideas from evolutionary economics, the sociology of innovation and institutional theory (Köhler et al. 2019). MLP argues that transitions are the result of dynamic processes between three nested levels of aggregation. The three levels are illustrated in the figure 2 below:

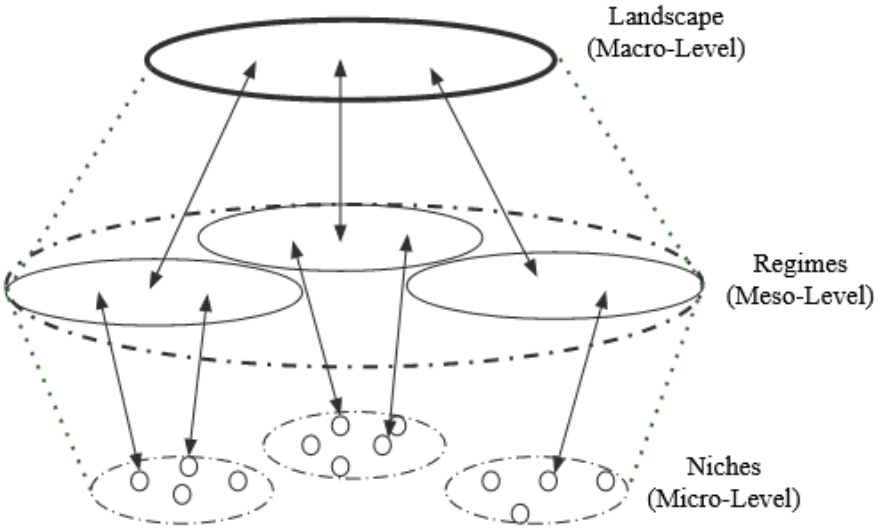

Figure 2: Nested levels in the multi-level perspectives (Geels 2002)

The socio-technical system (or regime) and the main unit of analysis in transitions is centered at the *meso-level*. The 'regimes' refers to the dominant structure, practices and culture and with the current power and vested interests, embodied in physical, economical and institutional structures in the societal system (Loorbach 2007; van den Bosch 2010). The socio-technical system at the meso-level accounts for the dynamic stability and incremental change in technological developments and thus there is a rigidity in the socio-technical system where new technologies normally are prevented from fundamentally altering the existing structures (Geels 2002; Loorbach 2007; Köhler et al 2019). The *micro-level* 'niches' are sub-system protected spaces which differ from the current socio-technical system and therefore it is the place of experimentation with changing dominant structures, practices and cultures (van den Bosch 2010; Köhler et al. 2019). Niches are not exclusively technological, and they can take many forms such as new rules, regulation, organizations, projects, ideas, and concepts (Loorbach 2007). Regardless of form, the central concept of a niche is its radical contrast to the socio-technical system's structures. The *macro-level* is 'landscape' development, and it refers to the overall settings in which transitions occur and it consists of slow-moving external factors. The landscape factors usually develop naturally but they have a heavy influence on the socio-technical system and niches (Geels 2002; Loorbach 2010). Typical factors include slow-moving trends such as cultural repertoires, shift in demographics, geo-politics, macro-economic trends, or external shocks such as war or pandemics (Geels 2019; van den Bosch 2010).

The MLP becomes a powerful tool as it tries at some capacity to marry the multi-dimensional and multi-actor approaches to understanding transitions. It emphasizes the importance of radical innovations (in niches) while also understanding that socio-technical system transitions are enacted by multiple social groups who engage in activities in different dimensions in the context of institutional norms and rules (Geels 2019). The general MLP dynamic uses technology in niches for arguing that that innovation builds up internal momentum. The built-up momentum puts a pressure on the socio-technical system and destabilizes the existing structures, practices, and culture. This creates an opportunity for niche-innovations to diffuse and disrupt the existing system (Geels 2019). However, disruption in the socio-technical system is likely to arise from external consequences as well. This often occurs when there are built up mismatches and tension within the socio-technical system. The reasons for such destabilization are many. One reason is changes in landscape developments that puts pressure on the regime (climate change and aging demographics are two external circumstances). More reasons are internal technical problems (e.g., bottlenecks), negative externalities that put pressure on the regime (e.g., societal activist pressures), existing systems having difficulty in fulfilling the needs of changed user preferences and competition between firms (chapter Geels 2004, SI and transition).

Transition studies is primarily in the social sciences and the ontological underpinnings mostly adhere to constructionism. Therefore, Loorbach (2007) argues that the framing and formulation of a 'socio-technical system' is arbitrary, and it is valid only if the actors within the system recognize it. In other words, the socio-technical system does not 'exist' in the physical reality. It is continuously (re)constructed by the actors who operate within it. The main concepts introduced, multi-phase and MLP, with the

former is used to describe transition dynamics in a non-linear manner, with multiple fast and slow phases across a time period (van den Bosch 2010). The latter provides a 'big picture' approach to study multiple actors and dimensions. Ranging from niche-innovations, socio-technical systems, and broader societal contexts in landscape developments (Geels 2019). These two concepts should however only be used as a means for analysis, and other models may also be of much practical use (Loorbach 2007).

2.3 System innovation

Modern societies face fundamental challenges in multiple sectors. The most visible example and call for action is done by the member nations of the United Nations (UN) who have co-developed an agenda to achieve 17 sustainable development goals by the year of 2030, named 'Agenda 2030' (United Nations 2015). Substantial improvements in efficiency have been made due to product- and process innovations (e.g., automobile catalysts). However, single 'incremental' innovations within the current socio-technical system are mostly dependent on existing trends and therefore not possible to greatly improve (Geels, Elzen & Green 2004; Geels 2019). Geels (2019) argue that the general inability to develop a vastly improved system is impeded by various 'lock-in' mechanisms. The first one is technological lock-in mechanisms which represent sunk investments in infrastructure, machines, and competencies that create vested interests against the desired transition direction. Additionally, technological high-performance efficiency and economies of scale which produces items or services at a low cost represents a barrier for transitions. Secondly, there are social and cognitive mechanisms which represent the mental rigidity to develop for change in individuals at long-existing socio-technical systems. There is also vested social capital in groups in the current socio-technical system who do not see the transition beneficial for them. Lastly, institutional, and political lock-in mechanisms. Incumbent actors in the socio-technical system favor existing regulations, standards and policy networks and thus create an uneven playing field with actors who favor the transitional change (Geels 2019).

Innovations at the system level which greatly improve efficiency are not merely technological, but it is the collection of technical, social, cognitive, and institutional shifts, such as new markets, user practices or regulations (Geels, Elzen & Green 2004). Sustainable transitions are therefore the result of system innovation at the socio-technical system level (Lundin & Schwaag-Serger 2018; Geels, Elzen & Green 2004). System innovation is schematically illustrated in the figure 3, as a contrast to mere optimization or a partial re-design. The vertical axis represents improvement in efficiency with factors of 2, 5 and 10 which are arbitrary, but they are meant to clarify the difference in promised improvement with system innovation. The horizontal axis represents the time period under study.

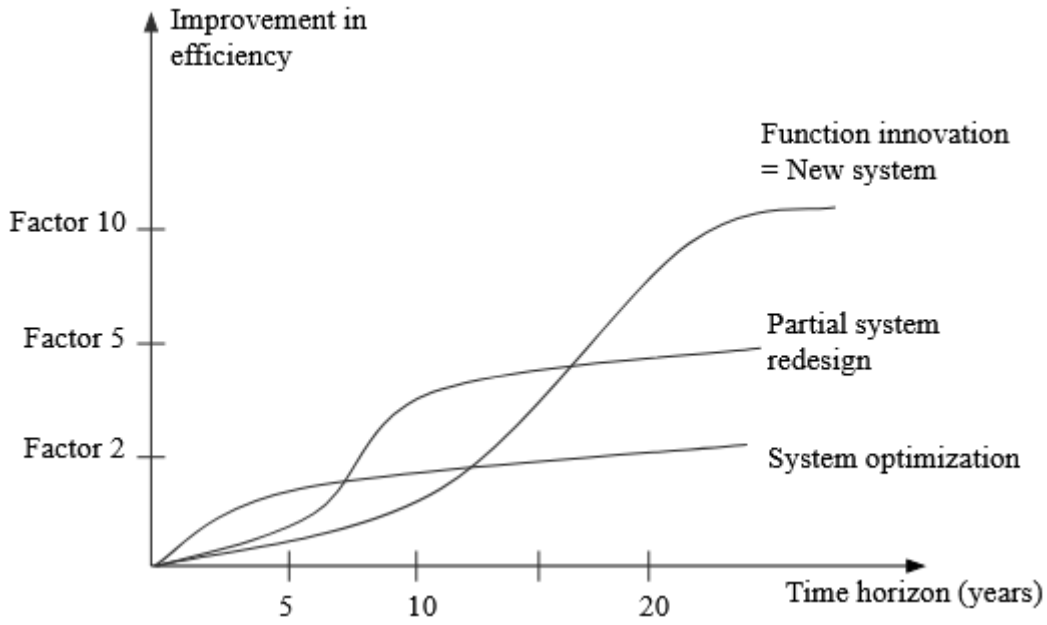

Figure 3: System innovation vs system optimization (Geels, Elzen & Green 2004)

Transitions and system innovation in the literature are often mentioned as inseparable or synonymous as they do share many of the same characteristics. Geels (2002) argues for four main characteristics. First, both concepts are co-evolutionary which involves changes in both the supply side (e.g., technology, industrial structures) and demand side (e.g., user practices and preferences). Secondly, both concepts involve 'architectural change' which implies that innovations are disruptive to existing technology and create new linkages between the new innovation and user practices. Thirdly, both concepts are enabled by multi-actor processes. Lastly, transitions and system innovation empirically happen only over a long time period (Geels 2002).

2.4 Transition Management

Transition management is a policy-oriented framework which combines ideas derived from complex systems theory and governance studies (Köhler et al 2019; Rotmans and Loorbach 2008). To build a common framework towards understanding transitions and which facts governance should adhere to, Rotmans and Loorbach (2008) synthesizes parallels between complex systems theory and new forms of governance. First, as a socio-technical system progresses from one state into another, the process is complex and uncertain. Managing transitions may be interpreted as a contradiction due to inherent complexity in socio-technical systems and the level of control is perceived as low. The level of ambition is high. However, transition management literature takes the viewpoint that there are systemic patterns which would be logical starting points for governance to explore and understand. Subsequently, these patterns can be indirectly influenced, adjusted, redirected, and guided through actions (Loorbach 2007). Secondly, governance of systemic patterns or major societal change are not conducted in a top-down fashion, but rather from combined top-down and bottom-up efforts. The goal is to combine the strengths from both approaches and avoid being too hierarchical or too loose (Loorbach 2007). Thirdly, the socio-technical system destined to undergo systemic changes will both be an important link *and* barrier for obstruction when the socio-technical system attempts to stimulate innovation towards a direction. Lastly, transitions of socio-technical

systems are most effectively conducted by offering ‘niches’ protected spaces where small innovation cores challenge the incumbent system. Lastly, transitions in socio-technical systems cannot be managed from outside the existing structures. Efforts made to influence the structure, practices and cultures should be directed and anchored inside the system (Rotmans & Loorbach 2008).

As the first starting point suggests, the principles for transition management are predicated on what is formulated as a management paradox, that transitions are inherently too complex and uncertain to manage but relatively simple rules to influence the transition can still be formulated (Romans and Loorbach 2008; Loorbach 2007; van den Bosch 2010). In efforts to rationally handle this paradox, the complex system analysis approach provides insights to societal complexity and thus help governance of finding opportunities to influence said complexity. The complexity analysis of a societal system provides insights for managerial approaches in efforts to influence the societal system in desired direction. Analytical concepts as mentioned earlier, such as the multi-phase and MLP, can provide managerial insights of the transition (Rotmans & Loorbach 2008). However, transition management is not deterministic, rather it is built upon reflexive rules and a continuous iteration of substance and process. The aim is to establish a reflexive cycle between substance and process, so new developments and contextual factors in the societal change are integrated in the managerial process where actions to anticipate and adapt are integrated in effort to influence the transition in a specific direction (Loorbach 2007).

2.4.1 Transition management principles

Transition management and its framework is built on a certain set of principles which provides a normative orientation towards a particular transition pattern. These principles are formulated below by Loorbach, Frantzeskaki and Huffenreuter (2015):

- Complex system analysis yields actionable and non-actionable insights for socio-technical system dynamics. Furthermore, no societal system is static which implies that process and content are inextricably linked.
- Transitions in a socio-technical system takes around 25-50 years from pre-development until stabilization. Short-term policy decision-making should therefore be considered in light of the long-term transition. Forecasting and backcasting are means to visualize future scenarios to inform short-term decisions (Holmberg & Holmén 2021).
- Keeping options and objectives flexible. No objective or intervention should be too rigid in its blueprint. Societal change is at odds with any specific intervention that is developed and implemented too early. It is similar in concept as lock-in mechanisms explained earlier. Structure and practice change while being directed, and objectives should be changed in light of development.
- The timing of interventions is crucial. Dynamic socio-technical systems provide windows of opportunity for transition management. For example, crisis situations often pose an opportunity to desirably influence structures, practices, and cultures.
- Actors in the current socio-technical system should be given space for the creation of an alternative ‘regime’. It is crucial for innovations that actors at a certain distance from the current socio-technical system are given sufficient

resources in terms of time, energy, organization administration and financial means, to explore new structures, practices, and cultures.
- A transition cannot be steered or influenced by the means of transition management outside the existing socio-technical system. Structures, practices, and cultures adapt and anticipate in a manner that they should be influenced from the inside.
- As transition management is predicated on reflexivity, where social learning is essential. The term learning has multiple contexts. First, actors need to learn from other actors outside their own domain. Secondly, social learning also has three components, learning-by-doing (knowledge building by testing), doing-by-learning (knowledge building and testing against theory) and learning-by-learning (developing learning strategies, applying, and evaluating them) (Rotmans & Loorbach 2008).
- Not only does actors need to learn from other actors, but it is also necessary that there is a multi-actor network and participants from a wide range of actors is crucial for system innovation. No single actor or limited group of actors have the capabilities of steering a transformation.

Rotmans and Loorbach (2008) have also developed a list of managerial principles; many are already included in the list above. They mention one more that is of relevance, namely:

- A socio-technical system consists of multiple levels (think MLP with macro, meso and micro). Steering transitions therefore require strategies at each level, which requires different instruments, policies, actors, and competencies. However, the challenge is to coordinate each level, so they work towards a common goal or set objective.

These management principles form the basis upon which a managerial framework of transition management has been developed. As the 'transition management paradox' suggests, the issue for developing a framework is finding the right balance of being prescriptive and practical without losing too much of the complexity (Rotmans & Loorbach 2008). Thus, the principles are in a practical sense, more reflexive than commands directed from a top-down manner. Transition management seeks to influence transition with experimentation, learning and exploring in a subtle top-down manner while utilizing the flexibility and ingenuity from bottom-up niches. Rotmans and Loorbach (2008) have developed a cyclical framework of developmental phases in a multi-level perspective.

2.4.2. Transition management: a cyclical multi-level framework

This cyclical framework aims to closing the gap between transition theory and transition management as a practice. The framework distinguishes different types of governance activities at different levels. Namely, strategic, tactical, operational and reflexive activities (Loorbach 2007; Köhler et al. 2019). Loorbach, Frantzeskaki and Huffenreuter (2015) describes practical transition management as the combination of developing together around a common understanding of a persistent societal problem and that should leverage a shared ambition towards steering the transition for sustainability. The cycle consists of the following components which are structured around the level of activities (Loorbach 2002; Loorbach and Rotmans 2006). In figure

4 these components are outlined: (i) problem structuring, establishment of the transition arena and envisioning; (ii) developing coalitions and transition agendas; (iii) mobilizing actors and executing projects and experiments; (iv) monitoring, evaluating, and learning. Loorbach (2007) suggests that the cyclical framework may visually appear to be straightforward, however, there are no fixed sequences or steps. The steps can appear in random or partially structured order and each step may carry different weight in each management cycle.

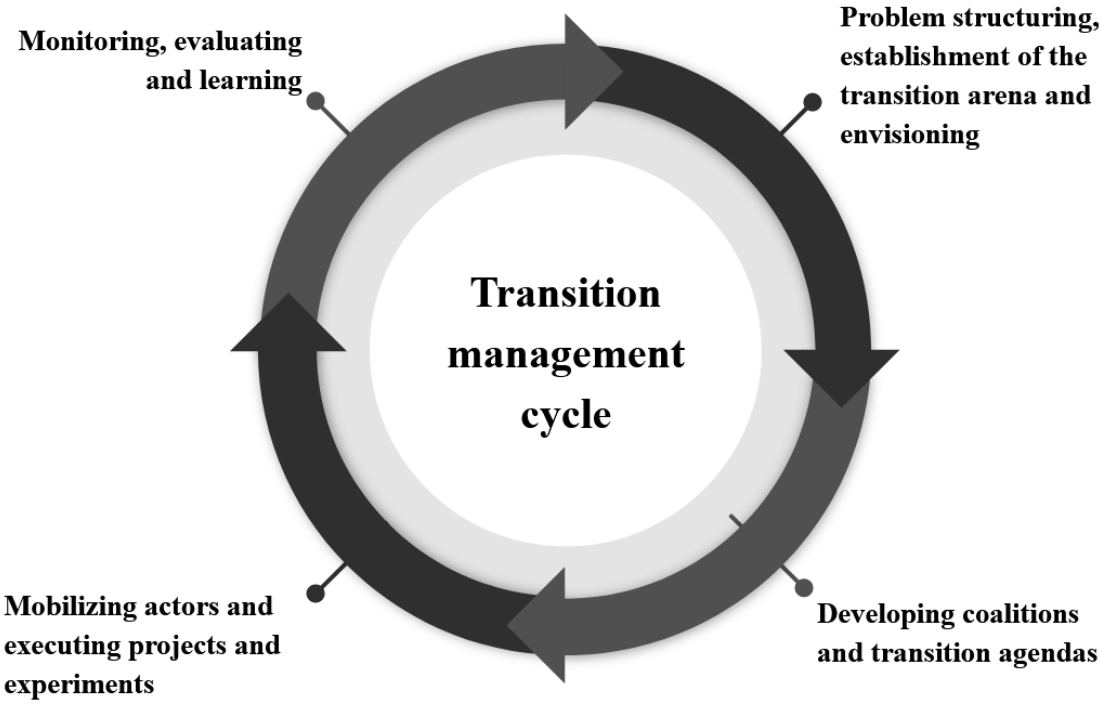

Figure 4: The transition management cycle (Loorbach & Rotmans 2006)

Each phase in the cyclical framework is associated with four levels that continually influence each other. Strategic activities are transition arena building and transition pathways identification. Tactical activities include developing specific plans for transition pathways into a transition agenda. Operational activities are on-the-ground activities (transition experiments). Reflexive activities are such as monitoring and evaluating operational activities which should lead to adjustments in visions and re-articulation of transition pathways (Köhler et al. 2019; Rotmans & Loorbach 2008). At each phase very specific actors and instruments are used in the management cycle. The ambition is that the cyclical management approach should co-evolve at the same time as the general transition progresses (Rotmans & Loorbach 2008). The activities are explained further in the next section.

2.4.3 Strategic transition management: problem structuring and envisioning

Transition management at the strategic level has its activities focused on in a long-term perspective. Vision development, strategic discussion, long-term goal formulation and norm setting. In the pre-development phase, discussions and debates relate around the 'culture' of the socio-technical system. Values, directions, ethics, sustainability, and identity are some key concepts in which multiple actors voice their desired intent for the transition of the socio-technical system. At this period one of the

major barriers for sustainable transition arises, long-term visions and goal formulation are often more implicit than systematically structured. However, the regular policymaking is often structured around short- to medium-term political cycles. Therefore, the transition agenda needs to circumvent traditional policy institutions to develop an agenda based truly in a long-term perspective (Loorbach 2007). However, the progress of the transition is dependent on the same traditional policy institutions as long-term actions needs to be translated into short-term actions as well (Loorbach 2007). The first activity cluster here is problem structuring. The structuring is a participatory process in which a multi-actor network focused on a persistent societal problem gets together with various perceptions and possible directions of the problem (Loorbach 2007). This is the first conceptualization of a 'transition arena' in which a relatively small number (~15) of actors ('frontrunners') from multiple different backgrounds (i.e., organizations) have their own perception of the persistent social problem in which the socio-technical system is facing. The most important aspect in the arena is the people who are invited and contribute, specifically their attitude and competencies. For example, frontrunners should first and foremost be open for innovation and system change, they should also be able to consider complex problems and be able with some authority to envision and implement and lead experiments within their own respective organization (Rotmans & Loorbach 2008).

These frontrunners will engage in the strategic activities such as problem structuring and vision development. The first activity serving as a precursor. The problem structuring will serve as a tool for conceptualizing the persistent societal problem into a shared language of the challenges and the socio-technical system, which will create a sense of urgency to act. The aim is to create a sustainability partnership who together through a common understanding reframed the system challenge. The shared articulation of the problems forms the basis in which visions of a sustainable future state of the socio-technical system and a transition agenda for moving in that direction is developed (Loorbach, Frantzeskaki & Huffenreuter 2015). The problem structuring and envisioning process is usually a time-consuming and labor-intensive process. It is nevertheless crucial in order to achieve development in a desired direction in the socio-technical system (Holmberg & Holmen 2021; Loorbach 2007). Transition arenas will, while the transition progresses, develop a sensitivity through the process of exchanging perspectives (Loorbach, Frantzeskaki & Huffenreuter 2015). The process of mutual understanding is just as important as the substance of the vision. As the transition progresses in society and in socio-technical systems the transition vision developed by the transition arena should co-evolve (Loorbach 2007).

2.4.4 Tactical transition management: coalition building, developing transition agendas

At this level, transition management is primarily focused on steering activities that have a vested interest in the current dominant socio-technical system. Actions conducted by actors in, or in close relation to, the current socio-technical system (e.g., negotiations, planning and control, financial structures) and institutions (e.g., regulatory, organizations, networks) are continually reinforcing and maintaining the existing socio-technical system. At this level, actors operate at system or subsystem levels, and it is at this level 'system innovation' is defined. The definition of these systems is flexible and may change over time (Loorbach 2007). To exemplify, a system within the healthcare industry could be hospitals, municipality care or primary

care, or different ‘domains’ within the healthcare industry as digitalization, market consumption or user practices. Actors at this level have a vested interest and goals within their system or domain and are typically not professionally overly concerned about the overall direction of the socio-technical system (a step above their system). This is an issue in the context of transition management and one of main drivers that leads to sub-optimization and fragmentation between the systems and a lack of a wholly integrated long-term perspective (Loorbach 2007). Tactical management is aimed towards bridging the gap between long-term overall visions at a societal level and the short-to-medium thinking at the system level (Loorbach 2007).

The transition arena based on the sustainability visions creates a transition agenda which targets these structural barriers (regulatory, technological, economical, infrastructural, cultural) at a system level. The transition arena which consists of a small number of frontrunners are not single-handedly equipped to tackle these barriers, which therefore starts the onset of coalition building. Through an expanding network centered around transition pathways and transition images, actors will mobilize to self-form coalitions depending on the system (Loorbach 2007; Rotmans & Loorbach 2008). A transition image represents an envisioned state of a future system in the overall socio-technical system. There can be multiple transition images representing different systems. Transition pathways are routes to the transition image via intermediate objectives. A transition image can have multiple pathways and conversely a single transition pathway can have multiple transition images. At each transition pathways coalitions at the system level engage in negotiations and strategization to achieve the intermediate objectives and orient the pathways towards the transition image based on outside developments (Loorbach 2007; Rotmans & Loorbach 2008). The instrument in tactical transition management is the transition agenda which consists of the overall problem definition and the future vision of the socio-technical system. Furthermore, transition images and the associated transition pathways are included with joint objectives, action points and projects are also included in the agenda, together with responsibility and division of labor (Loorbach 2007). One important aspect is that frontrunners and actors involved at this stage are competent and have the authority to translate transition images into transition pathways within their own organization. Tension between the ‘status quo’ policymaking in the existing system and the transition arena will inevitably arise, hence skillful navigation of these issues will become an important asset (Rotmans & Loorbach 2008).

2.4.5 Operational transition management: mobilizing actors and implementing transition experiments

Tactical transition management focuses its activities on removing structural barriers. Operational transition management is concerned with short-term activities and experiments that have an innovation potential to be disruptive of dominant structures, practices, and cultures (Loorbach 2007). As transition management trickles down from strategic, tactical, and now to operational, more actors and individuals are involved. As transitions activities are decided to be conducted in the transition arena, operational transition management implements these activities, which is often very demanding because more actors are involved who share different perspectives, and sometimes with competing interests (Rotmans & Loorbach 2008). The primary goal from this experimental and practical stage in transition management is acquiring

knowledge about the innovation potential in short-term activity and how it affects the transition in the overall socio-technical system. The knowledge gained can therefore act as steering for the guiding visions and the transition agenda, where new insights or knowledge can be incorporated or change overall visions (Loorbach 2007).

Transition experiments are one of the instruments used within operational transition management. It was described by Rotmans et al. (2000) as "practical experiments with a high level of risk that can make a potentially large contribution to a transition process". Transition experiments share the same complex systems grounding as transition management at large, with additional elements in evolutionary theory and innovation theory. Complex systems theory describes that many small interventions and changes throughout a socio-technical system can carry large consequences for a desired transition. Evolutionary theory stresses the importance of variation and selection in experiments to generate variations which can lead to a distinct new regime or contextual factors such as market and institutions (Schot and Geels 2007). Innovation theory explains that experiments for innovation potential should be conducted in 'niches', thus through selection criteria and resources may spawn a new and divergent trajectory within the socio-technical system and the transition at large (van den Bosch 2010). However, transition experiments as an instrument in transition management serve a broader purpose than furthering a mere technological innovation. Three characteristics are central in transition experiments according to van den Bosch (2010):

- *Societal challenge:* Transition experiments have a starting point in societal challenges. A societal challenge is a persistent, complex, and uncertain problem in society. The problem itself lies in the structure, culture, and practices of society, which makes it difficult to find a solution with the dominant way of addressing problems.
- *Innovation:* Within transition experiments, the innovation needs to have a system innovation perspective, as the innovation needs to transcend between organizations, system levels and societal domains.
- *Learning:* As transition management is a cyclical continuous process, changing the culture, structure, and practices of society, learning from the experiments becomes essential. The learning from experiments has three tenets. (i) *broad* - learning takes place through multiple domains such as cultural, economic, institutional, organizational, and the coherence between these domains. (ii) *reflexive* - learning about the underlying assumptions of the transition experiments and if they correspond to the overarching values to the transition at large. (iii) *social* - learning in the transition experiment which helps multiple actors to interact and develop new perspectives. Social learning galvanizes multiple actors to reframe their existing way of thinking and address a persistent problem or change underlying assumptions.

To expand on further differentiating classical innovation experiments and transition experiments, The table 1 below summarizes the nine distinct characteristics comparing the two experiment types. Even though in comparison characteristics of classical experiments and transition experiments may display big differences, in practice the difference is more subtle, and overlapping characteristics exist. A distinguishing characteristic can be incorporated and co-exist in both experiment types. For example, transition experiments often involve both first order and second

order learning, classical experiments can involve multiple actors and so on (van den Bosch 2010).

Table 1: Comparison of classical and transition experiments (van den Bosch 2010)

Characteristics	**Classical innovation experiment**	**Transition experiment**
Starting point	Possible solution to make innovation ready for market	To solve a persistent societal challenge
Nature of the problem	Priori defined and well structured	Uncertain and complex
Objective	Identify satisfactory innovation	Contributing to transition
Perspective	Short- and medium-term	Medium and long-term
Method	Testing and demonstration	Exploring, searching, and learning
Learning	1st order and single domain	2nd order and multiple domains, broad and collective
Actors	Specialized staff	Multi-actor alliance
Experiment context	Partly controlled	Real life and societal context
Management context	Classic project management	Transition management (focused on societal transition goals)

Experiments that are sustainability-oriented are not only promoted as a positive influence on socio-technical systems transitions. Sengers, Wiezorek and Raven (2019) explains that experiments often die without making any significant impact on the current systems (Sengers, Wiezorek & Raven 2019). Ideal transition experiments are incorporated into a large array of transition management instruments (e.g., transition arena, transition agenda, visions), therefore transition experiments are not in isolation. On the contrary, it is reinforced by a vision and agenda towards transition (Loorbach 2007; van den Bosch 2010). With three mechanisms, transition experiments contribute to sustainability transitions (van den Bosch 2010):

- *Deepening:* This mechanism can be described as the learning process through the transition experiment. The main idea is to learn about what can be changed with the present structures, cultures and practices and what potential there is. van den Bosch (2010) explained this as: *"A transition experiment enables actors to learn about local shifts in ways of thinking, values and perspectives (culture), shifts in doing things, habits and routines (practices) and shifts in organizing the physical, institutional or economic context (structure)."* This also means that the actors involved in the transition experiment learn about the complex interrelations and how a small shift in thinking can affect them and change the relations. In such a manner, they can learn in a small context, as a transition experiment, how to fulfill a societal need in a new, different way.
- *Broadening:* van den Bosch (2010) describes broadening as repeating a transition experiment in different contexts to be able to link it to other functions and domains. The point is to learn from the experiment and then gradually build on the new structures, cultures, and practices in other contexts.

Broadening could potentially lead to different results: 1) The new structure, culture and practice can be used in a broader function, meaning that the new methods and activities can be used in a different sector or other context. 2) The new way of thinking can fulfill other social needs.

- *Scaling-up:* Transition experiment mainly uses the existing socio-technical system as its experimental testing ground and the outcome of this mechanism is to scale-up the deviant structures, practices, and culture at the level of the socio-technical system. Initially, these new ways of fulfilling societal needs through the change in structures, practices and culture are deviant. The scaling-up mechanism is intended to bring broader influence and eventually the new constellations are the dominant way. Thus, moving the experimentation to the mainstream.

2.4.6 Reflexive transition management: evaluation and adaptation

One of the core tenets in transition management is linking the transition management process with content. A societal transition is a complex and uncertain continuous development throughout multiple dimensions in the socio-technical system. Therefore, continuous monitoring and evaluation of the transition process is of importance (Loorbach, Frantzeskaki & Huffenreuter 2015). Activities are aimed at monitoring developments at multiple levels in the socio-technical system but also macro-development. The existing situation will be evaluated for potential misfits of intended and actual transitional development. Through debates, discussions, research, and evaluation societal problems are continuously reframed, which lead to the adjustment of sustainability visions and subsequent best-practices in the transition agenda (Loorbach & Rotmans 2010; Köhler et al 2019). Loorbach, Frantzeskaki and Huffenreuter (2015) argues that the monitoring and evaluation should be structured with respect to the previous segmentation of strategic, tactical, and operational transaction management. First, the transition arena should be monitored. Arenas are usually informal networks, but they should be monitored regarding behavior, network alliances and responsibilities. The activities conducted by actors with projects and instruments should also be monitored. Secondly, the transition agenda contains transition images and its associated transition pathways, with intermediate objectives and projects should all be subject to monitoring and evaluation. Including operational aspects as in transition experiments and how these experiments are generating insight and how it is transferred for social and institutional learning. Lastly, the transition process must be monitored to search for barriers, rate of progress and improvements. This requires an integration of monitoring and evaluation between and in each phase in the cyclical framework which may stimulate a learning process between the multiple actors (Loorbach, Frantzeskaki & Huffenreuter 2015).

2.5 The transition arena

Transitions are unpredictable, complex and involve multiple actors horizontally across domains, and vertically in levels of societal structures. It is therefore impossible to plan or direct a transition process through conventional management and policy making means. Traditional governance arrangements typically lack long-term thinking across multiple domains. Transition management however argues that through complex analysis and careful coordination of process and content, it is possible to influence and guide a transition process. The transition arena is a governance arrangement within transition management aimed at influencing and

guiding a transition towards a desired direction through an arrangement of multiple actors with a co-producing approach to innovation and learning (Loorbach 2007).

The literature of transition management and specifically the transition arena at large provides a prescriptive framework. However, it is important to emphasize the avoidance of blueprint thinking. Any transition management instrument or the transition arena are a prerequisite for transitional success in a desired direction or even that a desired transition takes place. The transition arena framework merely enhances the chances of influencing a transition process in a desired direction. Multiple applications of the transition arena have been made to solve societal issues on both regional and national level and in multiple sectors (e.g., energy, healthcare, urban planning) (Loorbach and Rotmans 2010; Frantzeskaki, Loorbach & Meadowcroft 2012; van den Bosch; van Raak 2016).

The transition arena overarching goal is through a multi-actor network to achieve a shared problem definition and articulate long-term objectives which are used to coordinate and stimulate innovation in niches (Loorbach 2007). Indeed, the promise of the transition arena are based upon writings on the effectiveness of best practices in small-group negotiations which stimulates group- and social learning (De Dreu & West 2001; van Knippenberg, De Dreu & Homan 2004; Frantzeskaki, Loorbach & Meadowcroft 2012). Thus, the participants involved in the arena are not prescribed goals and objectives to be fulfilled by an external entity, the focus relies on the co-production process where participants themselves set the conditions in which the arena- and the transition process should evolve (Loorbach 2007). The participants will form a coalition where mutual understanding of diverse perspectives is shared, and common identities are found. Through the co-production process the participants reframe societal problems and articulate an agenda for the transition where the participants are tied to a common belief in possibility of a transition towards sustainability (Loorbach 2007; Frantzeskaki, Loorbach & Meadowcroft 2012).

2.5.1 Transition arena: Where and who?

One of the core ideas of transition management is to influence a transition towards disrupting the incumbent socio-technical systems structures, practices, and culture. In other words, transition management and its associated instruments can be considered a threat to the incumbent socio-technical system. Paradoxically, the socio-technical system is usually the promoter of the transition and at least partly financially responsible for the transition arena despite representing the ‘status quo’. Therefore, in light of the enormity of the socio-technical system the transition arena should be protected outside the existing structures and provided institutional and cognitive room for the development of transitional instruments (Loorbach 2007). It is set to operate, at least partly, independently from existing traditional policy structures, incremental improvements, people with vested interest in the status quo etc. The transition arena can loosely be described as an experimental policy-niche with concepts (e.g., long-term thinking, system innovation, frontrunners) orthogonal to the traditional policy structures (Elzen, Geels & Green 2004; Loorbach 2007). Despite its distanced relation to the existing structures, during the transition, the transition arena becomes increasingly connected to the current socio-technical system as the arenas' disruptive measures take more concrete form. This will form a process of convergence and divergence, as the transition arena uses the structures when implementing experiments. The transition arena and traditional policy making exchanges ideas and

agendas before the transition arena diverges again. Because of this relation with niche developments (e.g., in transitional experiments) and the transactional relationship with the existing socio-technical system, the transition arena is abstractly speaking positioned between the meso (regime) and micro (niche) level (Loorbach 2007).

The most prominent feature of the transition arena are the participants included. It is a small group of actors from multiple domains, and they are defined as 'frontrunners. Each one of the participants are there because they, despite a difference of perspectives, are dissatisfied with the current paradigms in the socio-technical system. They are not therefore necessarily in the transition arena to represent a certain organization, but as individuals acting on a personal basis (Loorbach 2007; Loorbach 2010; Frantzeskaki, Loorbach & Meadowcroft 2012). However, because the transition arena often uses the existing structures to implement its instruments the frontrunners need to have some strategic authority within their respective organization in the socio-technical system. In fact, this is how the transition arena is legitimized by the socio-technical system. Additionally, the frontrunners should reflect the complexity of the transition ahead. In other words, the most relevant aspects or features of the transition should be represented by frontrunners. Normally, this implies a representation from the government, businesses, knowledge institutes and intermediaries. In essence, a healthy mix of actors from the more strategic system-level entrenched in the socio-technical system and the more innovative niche-level is sought after (Loorbach 2007).

Participants who are the subject for selection to become a frontrunner in the transition arena must also possess some basic competencies. The desired competencies in a frontrunner are twofold, again referring to the recurring theme of linking process and content. Process capabilities generally regard the frontrunners psychological aptitude for change and the ability to operate within a group. For example, the willingness and networking skills to solve problems together, the ability to communicate and convey ideas and visions. The content capabilities include the ability to problem solve, which include creative and abstract thinking. The capabilities are included in the table 2 below (Loorbach 2007; Loorbach 2010).

Table 2: Capabilities needed in a frontrunner (Loorbach 2007)

	Process capabilities	**Substance capabilities**
Strategic	Networking skills	Systems thinking
	Communication skills	Creativity and imagination
	Guts	Problem structuring skills
	Ambition	General knowledge
	Leadership	Large network
	Vision	Abstract thinking
Tactical	Negotiation skills	Strategic thinking
	Communication and consensus building	Analytic ability
	Thinking in terms of co-production	Specific knowledge
	Open to new combinations	Innovative ideas
	Coalition building	

2.5.2 Space, facilitation, and leadership

Prior to the above-mentioned capabilities, one important aspect is whether the potential frontrunner has the time and energy to participate in a transition arena as it is a strenuous project to participate in. The candidate may believe fiercely in the intended transition arena and the overarching vision of the transition but are overwhelmed by their main occupation which leaves this candidate unwanted for selection (Elzen, Geels & Green 2004). Leadership and facilitation in the transition arena is immensely important despite the reliance on co-production, because of the reason that often frontrunners do not have the time, energy, or specific knowledge to immerse themselves in the complex problems (Elzen, Geels & Green 2004; Loorbach 2007). Therefore, ideally the transition arena is supported by a facilitating transition management team (e.g., transition management experts, experts in the socio-technical system transition, process facilitators). The table 3 below displays the different roles and their tasks in an ideal transition management team:

Table 3: Roles of the facilitating transition management team (Loorbach 2007)

	System analysis	**Actor selection**	**Arena process**
Initiating organization	Provide information, reports	Identify participants, select	
Transition experts	System structuring, transition analysis	Develop interview protocol, do interviews, select	Structure process and substance/discussion
Substance experts	Relevant knowledge, data, facts	Provide participants, do interviews, select	Support process with information
Process facilitators			Facilitate meetings

The transition management team is a supporting team that should ease the transition arena co-production process in multiple tasks. A transition arena is typically started by an organization with some governmental affiliation (Loorbach & Rotmans 2010). Transition experts are typically actors from academia within the field of transition studies or management consulting specialized in transformational change (van den Bosch 2010). The transition experts provide structuration with appropriate frameworks and analysis of the transition process. Content experts focus on the socio-technical system which is undergoing the transition. They provide the context in which the transition experts can situate the transition in as each transition is unique and no 'blueprint' exists. Both the transition and context experts provide and process information before each meeting and what was decided/discussed during the meeting and provides the processed information to the participants before each meeting so they can quickly get up to speed. Since the transition arena is a co-producing arena and meetings are valuable time, there is also a need for an expert in meeting facilitation (Loorbach 2007; van den Bosch 2010).

Frontrunners are essential to the transition process in transition management and by selection they bring drive, energy, and time to confront the transition process's many hurdles. However, it is foolish to assume that the transition arena and its frontrunners will accomplish anything by sheer will and determination. The transition arena needs empowerment, support, and space for their innovation activities. The 'space' does not

only imply financial space in the sense of having the means for executing transition experiments and administering the transition arena process or the organizational space where the frontrunners are free to experiment (earlier referred to a policy-niche). The arena should also be a mental space where frontrunners are free to express their opinions and concerns in a protected judgment-free zone. Classical power hierarchies found in the incumbent socio-technical system should be abolished to leave the frontrunners free to embark on a creative process to develop innovative ideas (Loorbach & Rotmans 2010).

2.6 A more practical note on transition management.

For digesting transitions in practice. Holmberg and Holmén (2021) have developed two complementary change logics to express a metaphor for the reflexive nature of influencing transitions. The metaphor uses a 'cruise' and 'expedition' as a way to distinguish between system optimization of operational activities and system innovation through exploring innovative ideas through experimentation. The two logics are equally important for the transition process at large and should be treated as complementary where mutual exchange and learning is the focus (Holmén 2020). The table 4 below displays the difference in characteristics between the two logics:

Table 4: Characteristics of the cruise and expedition

Cruise (Learning I)	**Expedition (Learning II & III)**
Optimize, refine, and improve what currently is	Think beyond, transform, and transgress what currently is
Routines, structures, and budget frames provide support	Routines, structures, and budget frames often constrain
The organization is in the center for leadership and decision-making	The challenge/question is put in the center where leadership Is enabling, facilitating and co-creative
Goals, targets, steering, control	Guiding principles, trust, space for change
Measurement and follow-up	Experimentation, reflection, and learning
Solving problems, implementing solutions. Making the undesired go away	Shaping futures, addressing root-causes. Making the desired come true

In the context of transition management literature, the two logics developed by (Holmberg and Holmén 2021) are a reflexive governance model similar to the transition management model which also emphasizes the collective experimentation and mutual learning to handle the complexity in transitions (Holmén 2020). The model developed by has been used and explained within a transitional context in Sweden. For instance, these two logics have been presented in the Swedish parliament by Holmberg at a seminar for the agenda 2030 (Holmberg 2018). Additionally, Holmberg has created a book for co-producing transformational change for the Swedish Association of Local Authorities and Regions (SALAR) (Holmberg 2020).

For venturing out on an expedition, Holmberg and Holmén (2021) explains that three dimensions are important for learning processes when guiding sustainable transitions. The dimensions are illustrated with a triangle encompassed by the challenge to be

explored in the figure 5 below. The challenge in the middle is meant to be the pulling factor, it is what attracts people to the expedition in the first place. At each corner, symbolizing equal importance is the space, process and leadership.

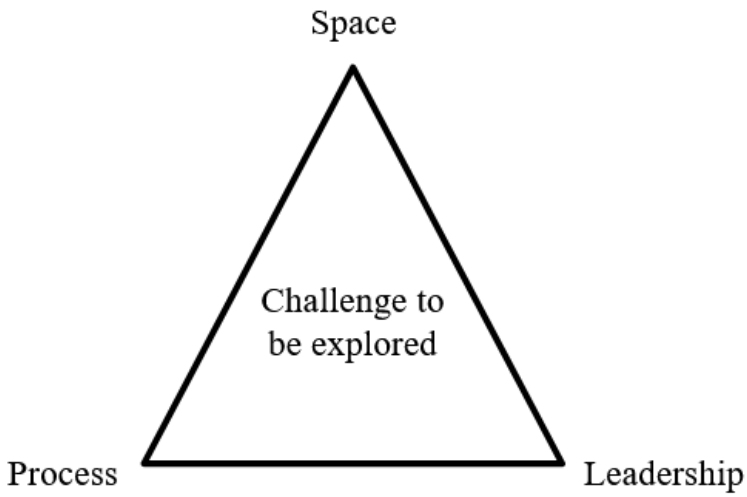

Figure 5: The expedition triangle (Holmberg and Holmén 2021)

Space

This dimension is indistinguishable from providing frontrunners space to frontrunners in the transition arena. Financial, organizational, and mental space is needed to truly explore the challenge ahead. Holmberg and Holmén (2021) emphasizes a relational aspect of space in the expedition. The space should be a safe container where learning is in the center. As with frontrunners in the transition arena, people in the expedition are a diverse group with different perspectives on the challenge to be explored, but with openness and trust as leading principles they can meaningfully address complex issues. It takes, however, skillful facilitation and leadership to make people feel involved and truly be involved in the expedition process. It is by no means a trivial task to eliminate prior conceptions of power hierarchies and open up for a co-production process (Holmberg & Holmén 2021).

Process

This dimension relates to what unfolds during the transition process in the expedition. Holmberg and Holmén (2021) explains that expeditions are not a random process, to direct an expedition in a desirable direction, tools and methods must be carefully chosen to fulfill the expectations of the expedition. The backcasting approach becomes a natural approach as the expedition purpose is to break away from traditional structures, practices, and cultures.

Backcasting is built on four principles as it explores implications of a desired future. Holmberg and Holmén (2021) list the following approach as a method for the expedition to influence a transition in a desirable direction:

1. *Desirability:* Formulate guiding principles for a sustainable and desirable future – what is important/should be, why?
2. *Reality:* Analyze some present situation or system on the basis of the principles: illuminate gaps and challenges – what is and is not, why?
3. *Transformability:* Identify leverage point interventions with the potential to shift systems and bridge gaps in a desired direction – what could be different, where?

4. *Trialability:* Strategically experiment with leverage points interventions – what can be, how?

As with the cyclical transition management framework, these four steps are not precisely linear, but they are meant to be iterative as one step builds upon another and vice versa (Holmberg & Holmén 2021).

Leadership

The leadership is meant to invigorate the other dimension. As the expedition is co-producing space, a top-down leadership would not be appropriate or fruitful. The leadership in an expedition is therefore more directed towards a collective and distributed leadership with all actors involved. The focus will rely on three interrelated roles (Holmberg & Holmén 2021). However, first and foremost the expedition, much like the transition arena, has a facilitator which provides a special input into the other parts of the expedition triangle. The facilitator ensures that enough time has been spent to identify, formulate, and frame the challenge ahead. Secondly, the facilitator provides the mental space required for the expedition and selects the most appropriate people for the expedition ahead. Lastly, make sure that the process and methodology are in line with the ambitions of the expedition (Holmberg & Holmén 2021).

According to Holmberg and Holmén (2021) the three leadership capabilities for successful expeditions are:

- *Leading oneself;* it starts with the assumption that to truly achieve change one must realize that we are all part of the system we seek to change. The individual in the expedition must question their own assumptions, worldview, preferences, and perspectives and be willing to listen to others.
- *Leading together with others;* this is particularly hard in a diverse group where people may have strong opposing views. The purpose of the expedition is not necessarily to seek a consensus but rather to listen to *all* other perspectives and search for the truth, not stress your own ideas and seek to be right.
- *Leading for humanity/sustainability;* At the end of the day, the expedition is not an isolated process. Eventually, the people will have to lead in their organizations and in their daily life. One must ask oneself, why the persistent societal problems exist and what are the root causes? To truly achieve system innovation, it is essential to stay long enough in these fundamental questions and not rush immediately into solutions.

3. The Swedish healthcare system

Swedish healthcare is dictated by the Health and Medical Services Act (HSL) (SFS 2017:30) where following responsibilities of the healthcare include measures to medicinally prevent, investigate and treat diseases and injuries, coordinate ambulance services and care of the deceased. HSL dictates that Swedish healthcare should aim to deliver good healthcare services on equal terms for the entire population (SFS 2017:30). Swedish healthcare services are primarily delivered in a decentralized organization, where the responsibility to finance and provide healthcare is delegated to the 21 regions, and to some degree the 290 municipalities. Within the boundaries of the HSL and other national regulations each region can independently decide how to organize healthcare services based on local circumstances. However, the Swedish state is still responsible for standardization, inspection, and the government equalization system (Good quality, local healthcare 2017) The different organizational levels, forms of care and how they relate to each other is visualized below in figure 6.

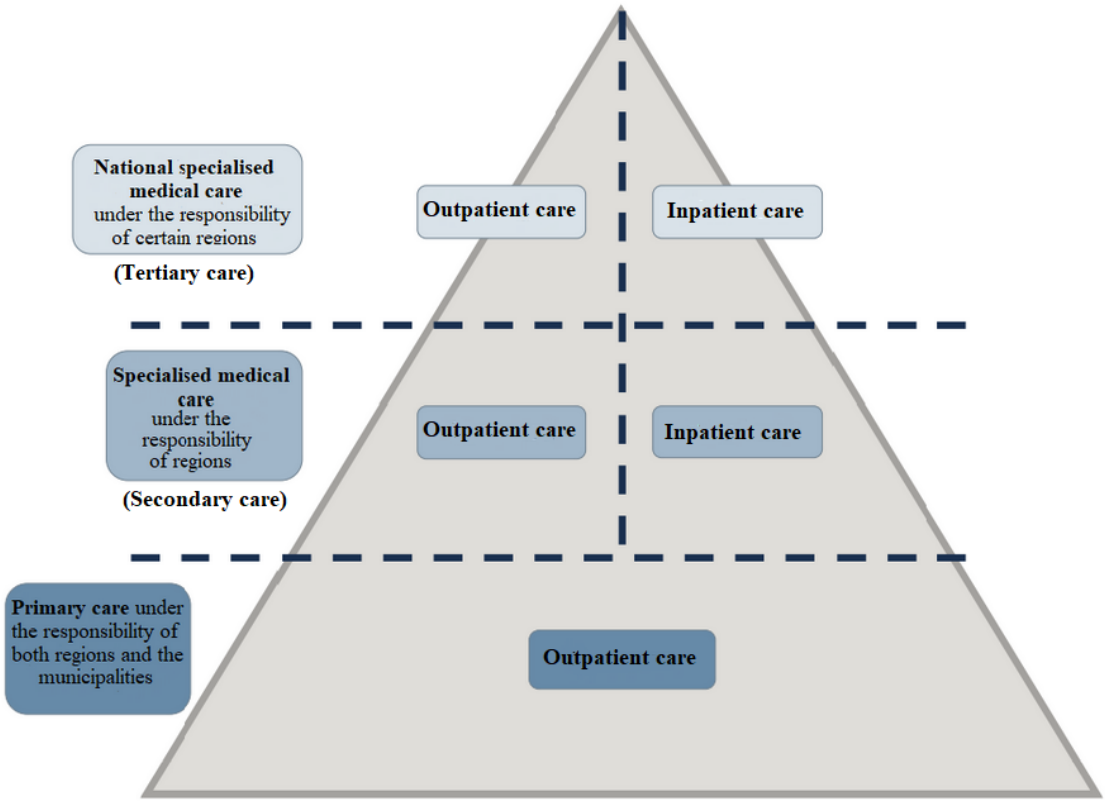

Figure 6: Health care structure and organization (Good quality, local health care 2020)

Healthcare services are delivered at an either outpatient or inpatient care facility. A patient who is hospitalized is treated at an inpatient care facility; any other healthcare treatment delivered to a patient is therefore conducted in outpatient care. Typically, the first point of contact and the principal point of continued healthcare delivery is at the primary care, which is a part of the outpatient care, and it is also the base of healthcare as visualized in the triangle. HSL relay responsibility for the primary care to facilitate the need to conduct basic medicinal treatment, nursing, preventative work, and rehabilitation which do not require the need for coordinating and employing hospital medicinal, technical or specialist competencies (Good quality, local healthcare 2017). Primary care is however under the responsibility of both

municipalities and regions. As part of outpatient care, municipalities have been relegated to the responsibility of providing good healthcare in special accommodations to the elderly, short-term accommodation (for disabled) and accommodations with special service to people with disabilities. Medicinal tasks are usually similar to tasks performed by medical professionals such as nurses and physiotherapists in regional healthcare, but municipal care does not include services provided by physicians, thus patients are often in need of both regional and municipal care. The primary care provided at municipalities is regulated in The Social Services Act (SoL) as opposed to HSL (SFS 2001:453; Kunskapsguiden 2021). Specialized health (secondary) care can be either outpatient or inpatient. At this middle-level only regions are responsible for delivering specialized healthcare (Good quality, local healthcare 2020). At this level, more sophisticated technical and medical expertise are needed in order to provide health care, which is typically provided at county hospitals or regional hospitals (Clinical studies 2021). At the top of the triangle in figure 1 there is national specialized medical care (tertiary), which is only a small part of the overall health care system (Good quality, local healthcare 2020). This highly specialized medical care is provided by the region and is coordinated as the whole county as a catchment area, thus only a few regional hospitals are able to provide this level of health care (Clinical studies 2021).

3.1 Why is there a need of transition?

Historically, investments in Swedish healthcare have been disproportionately made in emergency and specialist care compared to primary care. Despite the long care queue, the public perception of hospitals is still highly regarded, and many inhabitants seek care at hospitals as one of the first points of contact due to its modern equipment and its high density of physicians. The primary care system is therefore deemed to be undersized in respect to both its expectations and potential. Primary care is incapable of being the first point of contact in healthcare and resources that could be used to provide care outside hospitals are still tied to the hospitals. Additionally, the demarcation of the healthcare system between the main providers, namely hospitals, primary care, and municipality care, is unclear which has led to a fragmented system. The symptom of a fragmented system is a division of responsibility and a lack of cooperation between the main providers, thus resulting in a healthcare system in which both the patients and workers have trouble navigating in. Internationally, Sweden is comparably excellent in terms of medical outcomes but fares less well on indicators related to issues such as accessibility, continuity, and patient participation (Good quality, local healthcare 2017).

A modern, accessible, effective, and equitable healthcare is purposefully designed to accommodate the inhabitants needs and expectations of today but also for future societal developments. In the past, healthcare was dominated by the diseases and injuries (e.g., infections or accidents) of an acute character. As medical achievements have progressed the healthcare system is facing new challenges. A shift in demographics due to an aging population brings an increased number of patients with multiple long-lasting illnesses of chronic and aging-related character. This often requires a coordinated medical response over a prolonged time from multiple actors in the healthcare system, a response where there is today a lack of accompanying structures to support a collective and well-coordinated good quality care throughout

the rest of the patient's life (Good quality, local healthcare 2018; Hellström 2021). The Swedish Agency for Health and Care Services Analysis (2016) estimates that one million patients in Sweden have a relatively complex need for coordination between multiple organizations and healthcare providers. These patients also require substantial support to coordinate their care (Swedish Agency for Health and Care Services Analysis 2016). The patients with diseases such as cancer and neurodegenerative illnesses drain the healthcare systems resources which also requires a development of care systems for implementation of personal, pre-emptive, participatory, and predictive care (Hellström 2021). Additionally, to not repeat historical mistakes in the transition, the GQLH inquiry specifically also concerns individuals, diagnoses, and groups other than an aging population which also requires a tremendous amount of resources from society and the healthcare system. For instance, mental illnesses or individuals struggling with addiction were not as common or as clearly defined in the inception of the healthcare system and thus the system is to a lesser extent capable of providing care for said patients (Good quality, local healthcare 2018).

As the demographic shift towards a greater aging population and the number of patients with complex needs increases, the Swedish welfare system must accommodate the future societal developments (Västkom 2021). The current operating model of the healthcare system is both financially and socially unsustainable. Expenditures in publicly financed healthcare are increasing year by year. According to the Swedish Ministry of Finance (2019) by the year of 2026 the financial gap between the healthcare expenditures and with the taxation rate (of 2019) is estimated to be approximately negative 90 billion SEK if the same standard as of 2019 is kept. In other words, if there are no transformational changes in providing healthcare and increased efficiency, the need for resources to sustain today's standard of welfare will increase faster than tax incomes (Ministry of Finance 2019). The transition towards an increased accessibility, continuity, and patient participation, especially in cases with long-term illness as promoted by the inquiry GQLH, will be imperative to maintain a solidarity based financed health care system by taxation. As of currently, despite good medical outcomes, the healthcare system does not meet the public’s expectations (Good quality, local healthcare 2018).

3.2 Governmental inquiry of ‘Coordinated development for good quality, local health care’

In March of 2017, the Swedish government appointed Anna Nergårdh to lead an inquiry named “Coordinated development for good quality, local healthcare” in which the assignment was to propose how to conduct a restructuring of the Swedish healthcare system (SOU 2021a). The inquiry’s mission is to support regions, governmental agencies, and organizations in their efforts to develop a modern, equitable, accessible, and effective healthcare with focus on bolstering primary care (SOU 2021c). In the efforts to influence the healthcare transition it is necessary to have a common target image of the future, one that is grounded in the concept of GQLH (Good quality, local healthcare 2017). Good quality care should be defined as the following to ensure healthcare is provided according to standards in the Health and Medical Services Act (HSL). The care should according to (Good quality, local

healthcare 2017):

- be of good quality and with a good hygienic standard
- satisfy the patient's need of comfort, continuity, and safety
- be built on respect of the patient's autonomy and integrity
- encourage good connections between the patient and healthcare personnel
- be easily accessible

The concept of local healthcare is elusive but centered around that healthcare to a greater extent should be moved from hospitals to other medical facilities, such as health centers or primary care centers, offering patients a closer geographical proximity to healthcare. Local care also encompasses efforts at providing care inside the patient's home (e.g., mobile teams, prehospital care, supporting self-care) and not just physically constrained by geographical distances. Local care would also allow for digitalization to help patients achieve a more accessible healthcare (Västkom 2021; Good quality, local healthcare 2017). At its fundamental core, the government inquiry does not intend for its reform to merely create a new organizational level and it is not a new name for a new primary care system. Rather, the reform intends to disrupt the current socio-technical system and create a new approach of providing healthcare with the starting point in the patient's needs, preconditions, and preferences throughout the patient's life (Västkom 2021).

3.2.1 The inquiry's take on factors for success and obstacles for the transition

Towards the transition for a more sustainable healthcare system, the inquiry Good Quality, Local Healthcare (2020) have produced several factors for the transition to be successful, and potential obstacles that could impede the transition. Both terms are understandably ambiguous in their interpretation. For instance, a factor for success could be transformed into an obstacle if it is neglected. Therefore, obstacles are interpreted as areas in which the existing healthcare system has devoted inadequate attention to and thus risks jeopardizing the transition's progress (Good quality, local health care 2020).

Factors for success

- *Person-centering and involvement of inhabitants and patients in the healthcare system's development:* The patient is rarely regarded as a co-creator of care in the healthcare sphere and have far too often been left out in the process of continuing care. The envisioned modern healthcare should place the emphasis on the patients/relative's needs, preferences, and resources. A central question in the transition to good quality and local health care therefore becomes: "What is important for you, as a patient and relative?".
- *Interprofessional learning and practices:* As the transition towards modern healthcare develops, it must be facilitated as a cooperation between the clinical professions and the main providers of health care to create a holistic ability to meet a patient with complex needs. Interprofessional competence theoretically implies that different professions (both clinical and administrative) have knowledge, understanding and respect for other professions functions, roles, and ethical values.

- *Salutogenic approach:* The future macro-level challenges will force the health care system to take more of a proactive approach to health and not focus on treating diseases or managing illnesses. Pre-emptively decreasing the risk of acute or chronic illnesses and promoting healthy life decisions is an underdeveloped category of healthcare both at the level of an individual and population.
- *Collaboration and coordination for a cohesive healthcare system:* To strive for a person-centered healthcare as more and more people will live longer and with complex needs there need to be gaps filled in the spaces between multiple actors and the collective use of public resources. Currently organizations within the health care system are typically categorized as hierarchical in which the primary aim is to steer and exert control of the internal organization. The envisioned future healthcare system's organizations will be more network-based as cooperation between actors is the fundamental characteristic. To achieve a coherent perspective, it is important that an actor can visualize and place themselves along a value-chain of health care delivery and extend that knowledge to actors in close proximity.
- *Prehospital and mobile care - an integrated part of the value-chain of health care:* Prehospital and mobile care for minor general health issues and specialized care should be an integrated part of the envisioned modern healthcare system where accessibility is one of the core tenets. Mobile efforts are increasingly being used as part of the outpatient care system to treat patients often with proximity or even at their own home close all around Sweden. The mobile care units both organizationally belong to the municipality primary care and the regional primary care which explicates the challenge of bridging culture, practices, technical solutions between region jurisdiction to achieve a cohesive care.
- *Coordinated control of sustentation of competence:* One of the tomorrow challenges is often staffing and sustentation of competence. While new and modern technologies such as digitalization, artificial intelligence and effective working procedures are perhaps seen as partial answers to the overall concerns of staffing for future needs. Some occupations have a relative shortage of qualified labor when skilled professionals choose to leave the occupation for other positions in healthcare or other industries. Other occupations have an absolute shortage of qualified labor. At a national level, a coordinated control of sustentation of competence is a key to a successful transition.
- *Logistical solutions and infrastructure that supports the transition:* As the transition of good quality local healthcare progresses, more health care delivery and treatment are envisioned to take place outside the walls of hospitals and primary care health centers. To enable the transition, logistical solutions and supporting infrastructure must be developed in parallel. It encompasses both transports of medicinal personnel, medicines/pharmaceuticals/equipment and mobile solutions that facilitate the healthcare-documentation and medicinal service such as laboratory- and image diagnostics.
- *Research, development, and education that follows and supports the transition:* The transition will eventually replace the current healthcare system's dominant structures, practices, and culture, and modern healthcare is anchored in research, development, and education. Therefore, it is essential that these aspects are updated and revised so they enable and support the

transition towards the envisioned goal. Specifically, more professions should be able to conduct research that helps to create strong and viable interdisciplinary research hubs and cooperation. Additionally, the interprofessional practices, patient-centered healthcare, system knowledge and digitalization in healthcare, should be taught in education along with the expressed intent of focusing on preventing illness and proactive care.

- *Digitalization developed from the patient- and healthcare needs:* Digitalization is an important tool and prerequisite in the transformation towards modern healthcare. Appropriately based on the patients, users and co-workers needs it can facilitate cooperation, increase efficiency, and increase participation between doctor-patient relationships. Digitalization often carries the characteristic of integrating actors in different parts of the system, therefore it should ease and increase the likelihood of creating successful interprofessional practices and cooperation between caregivers and professions. Additionally, the opportunities lie also with the possibility for patients to further personalize their health care and create comfort. A subcategory within digitalization is Artificial Intelligence (AI) which should be explicitly mentioned due to its popularity among different industries, healthcare is no exception. AI also provides an opportunity to offer a greater personalized- and knowledge-based care with more robust predictability than the human counterpart.
- *Collaboration with actors outside healthcare:* The determinants for good health are not exclusively related to the healthcare system**.** The civil society in terms of cultural and sports association, retired-organizations, employee health services and religious communities can provide the individual with pre-emptive and active self-care that stretches outside the healthcare system. However, the healthcare system does have an important role in providing subjects of substance and relevance for other sectors concerning health. Especially in the field of mental health, actors outside the healthcare system play a vital role in being a guide when an individual seeks treatment etc.

Obstacles

- *Lack of persistence:* There is no shortage of healthcare reforms that have been unsuccessful in its mission to have a transformative influence on the healthcare system. The reform and the transition at large require a broad and strong political will that stretches along ideological conceptions and across multiple periods of mandates. One challenge will therefore be to garner and sustain support and enthusiasm for the transition. There is a need to create a fundamental joint vision for how the overarching development of the healthcare system should be developed across the different regions in Sweden (with reservation for regional and local differences that requires context-specific solutions).
- *Lack of holistic perspective and system knowledge:* From centuries of development the Swedish healthcare system is today left incredibly complex and difficult to create a comprehensive picture of the system as a whole. Any individual who works to aid change in the system is faced with a daunting task of gathering adequate system knowledge and a holistic perspective. The fragmented and complex system is not necessarily a strategic decision but rather an organic development of decentralization. Therefore, there is not a unison tool or governance system to pragmatically evaluate and follow up all

actors of the healthcare system. For the patient who cannot see their role in the larger system the incentives are miniscule for wanting to contribute and improve the system as the potential gain is overshadowed by system complexities.

- *Variation in interpretation and implementation of legal framework:* Interpretation and implementation of the same legal framework between the different regions and municipalities poses a credible obstacle to the transition. A difference in implementation can lead to disparities in health and impede eventual cooperation. This threatens the credibility of the healthcare system to provide care on the same conditions independently of where one resides in Sweden.
- *Financial challenges for municipalities and regions:* Previously mentioned as one of the main drivers for the transition, financial challenges will conversely be an obstacle to the transition. Throughout Sweden there are multiple regions and municipalities with main providers of healthcare who are operating with a negative financial deficit. At a time where more financial means need to be invested for the development and testing of new structures and practices, instead providers within the healthcare system are forced to slash budgets and cut down within organizations. Typically, more rehabilitative, health promoting activities and resources devoted to cooperation with actors outside one's own organization are the first ones to see their budget significantly reduced. Unfortunately, in a long-term perspective these areas are deemed central for improving the overall public health which is a main target for the transition described in Good Quality, Local Healthcare (2021).
- *Lack of inclusion of co-workers at all levels within the healthcare system:* Major transitions or transformational changes within an organization always run a considerable risk of failing to involve all co-workers in the hierarchy of which the transformation entails. Instead, the transformation only circulates at the strategic level of main providers of healthcare and civil servants without ever being anchored throughout the organizations. The transformation therefore needs to be articulated in the local context to what it entails, why it is being conducted and which parts of the actors are concerned.
- *Challenges with sustentation and development of competence:* One of the determinants and drivers for success in the transition is competent staffing and pragmatically educating and in-service educating personnel. Great challenges threaten the transition in this area. Main providers of healthcare see a considerable wave of retirements and a strained recruitment process which impedes the possibility of providing effective care at the right place. The worrisome development also extends to occupational non-clinical groups which support the caregiving professions.
- *The need for investing in the health care facilities and infrastructure:* Currently, there are great needs to invest in new or renovate old medical facilities. This may substantially influence the financial means that could be allocated towards the transition. Additionally, substantial investments in current buildings and infrastructure may cement old (undesired) structures which the transformation seeks to change/or restructure (known as a technological lock-in mechanism). This could eventually result in a missed opportunity to develop new flexible and sustainable facilities aligned with the envisioned future of a modern health care system.

- *Lack of aggregated data and knowledge about primary care:* Sweden lacks a national systematic way to follow up on primary care on an aggregated level with common standards. Thus, the healthcare system lacks the necessary data and statistics needed to conduct evaluation and ensure the quality standards for primary care. Without data at the aggregated level, it becomes nearly impossible to track developments in the transition.
- *Lacking knowledge in leadership issues:* Managers and leaders are essential for creating and driving the transition needed towards modern healthcare. Swedish Agency for Health and Care Services Analysis (2019) reported that managers and leaders need prerequisites and the competence to lead in complexity, lead with other leaders, lead for improvement and lead for increased patient-centering.
- *Regulations and practices that exclude marginalized groups:* Often new regulations and practices are unintentionally created in a way that exclude the most marginalized patients and inhabitants (e.g., elderly and people with physical and cognitive disabilities). It requires a strategic structural solution with all actors to remedy. For example, implementing new technical solutions that in effect does not encompass all patients who lack the technological equipment and capabilities to use the new solution but are in need of the service.

4. Case Study - The collaboration arena within the initiative ‘Moving healthcare home

In the face of the transition towards a sustainable health care system three departments within Chalmers University of Technology started an initiative in September 2021 called “Moving health care home (När vården flyttar hem, MHH)”. This initiative is not formally associated with the national Inquiry ‘Good quality, local health (2020)’. However, the initiative shares the overall envisioned future with the inquiry of the necessity of shifting health care focus (Malmstedt 2021). The initiative's primary two aims, as of August 2021, is to first establish a long-term collaboration arena with focus on research and development, which have a purpose to guide societal transition in health care. To accomplish this aim, the initiative has set out to use several tools. The first is quadruple-helix-cooperation with multiple stakeholders in the transition, figure 7 is an example of a envisioned cooperation structure.

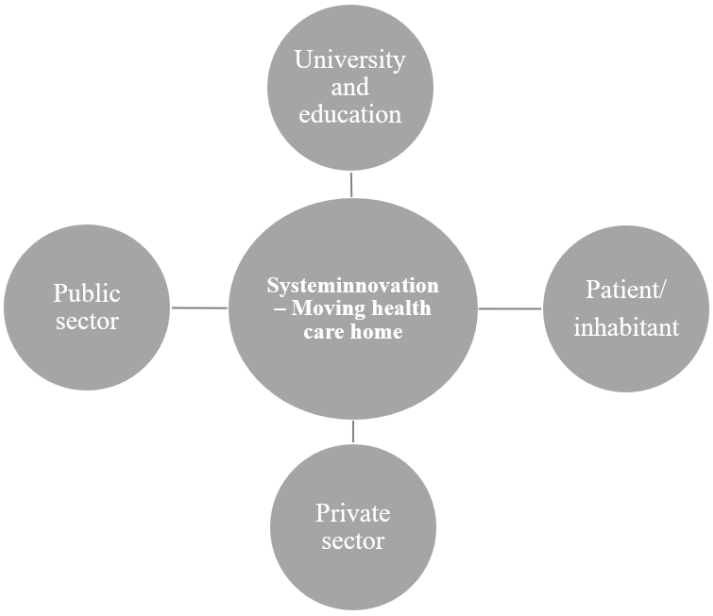

Figure 7: Example of a quadruple-helix-cooperation (Hellström 2021)

As a health care transition is not accomplished by an individual actor, the initiative sets out to involve multiple actors from the public sector, industry and commerce, universities, and the patients to draw upon multiple perspectives to aid a mutually beneficial path forward in the transition (Hellström 2021; Riconfigure 2021). Secondly, a prominent tool is to develop and later disseminate knowledge in one’s respective organization. For example, Chalmers University of Technology offers several courses specifically for medical and non-medical professionals in organizational development and leadership. Education is seen as a catalyst for improvement which guides the transition. Lastly, the initiative aspires to coordinate, initiate, and generate projects of mutual interest in accordance with the transition, examples of projects will be detailed further below (Hellström 2021).

4.1 Who are involved

The principal organizer is the Centre for Health care Improvement (CHI) based at the Department of Technology Management and Economics at Chalmers. CHI’s general

aim is to collaborate with health care organizations and create, transform, and diffuse research-based and action-oriented knowledge. Specifically, within disciplines such as quality sciences, logistics, production planning, innovation and organizational learning (Centre for Health care Improvement (CHI) 2017). The research field in Health Engineering at Chalmers supports the development of new technologies and innovative solutions within five profile areas that help solve health challenges in society (Health Engineering 2021). The Center for Health care Architecture (CVA) is a national arena with a particular research focus on buildings and physical environments and how it supports the interaction between health care, patients, and architecture (Center for Health care Architecture (CVA) 2021). Together, these initiators form the Chalmers team at the initiative "Moving health care home" and contribute with a multidisciplinary expertise ranging from issues concerning organizations, medical technologies to architecture (Malmstedt 2021). The initial organization of the initiative's collaboration arena and how each level relates to each other is visualized below in figure 8. The initiating Chalmers team is responsible for the coordination and management in the collaboration arena.

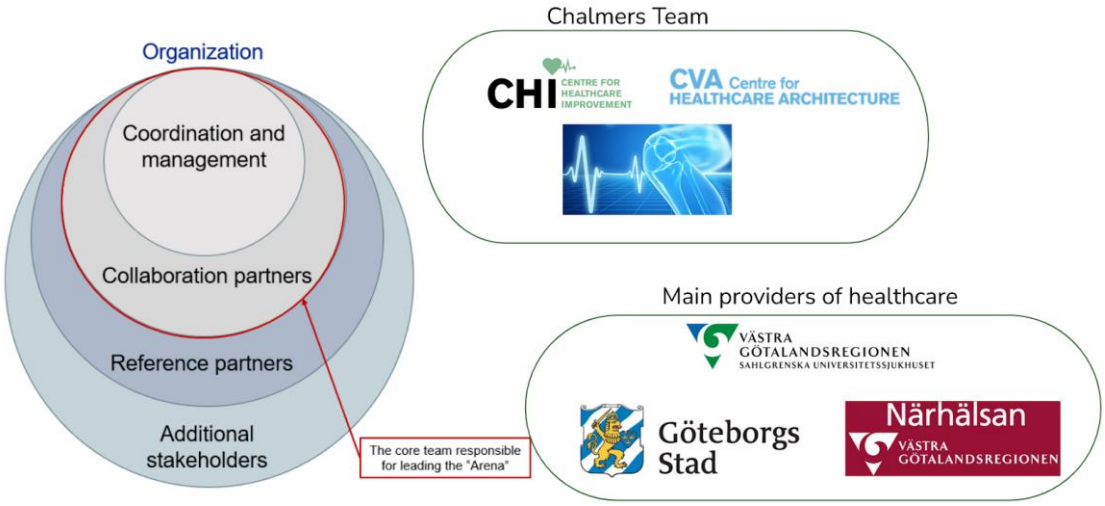

Figure 8: Organization of the collaboration arena (Hellström 2021)

In addition to the Chalmers team, there are multiple other partners who are primarily the main stakeholders and providers of health care in the face of this transition. Namely, Sahlgrenska University Hospital, Närhälsan and the city of Gothenburg. Together, these main stakeholders and the Chalmers team form the core team responsible for leading the collaboration arena and initiating projects of mutual interest (Hellström 2021).

Sahlgrenska University Hospital is the largest hospital in Sweden, employing around 17,000 people. As a part of Region Västra Götaland it is financed by public means and is the largest partner in the collaboration arena. Several medical facilities form three campuses spread out in the Gothenburg area, Östra, Mölndal and the main campus Sahlgrenska (Sahlgrenska University Hospital 2021).

Närhälsan is the largest provider of primary care in Sweden and as Sahlgrenska University Hospital it is also a publicly financed health care function. Providing primary care in Sweden is under the responsibility of both municipalities and regions. Närhälsan is however not a part of the municipal primary care and holds different

responsibilities. In total Närhälsan employs 5,680 people across 50 professional occupations. In Region Västra Götaland alone there are 104 health centers, 102 children welfare centers, 60 rehabilitation clinics and more (Närhälsan 2021). Thus, Närhälsan is the stakeholder representing regional primary care in the collaboration arena.

Lastly, the final main stakeholder in the collaboration arena is the Gothenburg Municipality as a municipal primary care provider. The city of Gothenburg provides health care at special accommodations to the elderly, accommodations with special service to people with disabilities, daily activities (an organization that offers meaningful work according to specific needs of a disabled individual (Health and Social Care Inspectorate (IVO) 2019)) and health care provided at home (Gothenburg Municipality 2021).

Reference partners and additional stakeholders are as of 2021 not selected. Reference partners are intended to be actors with expertise knowledge that could aid the collaboration arena's activities and projects at a strategic level. The additional stakeholder can be groups with a vested interest in the transition such as the private sector, advocacy groups etc. (Hellström 2021).

4.2 Pilot projects of interest for the initiative MHH

One of the initiatives tools to enable and guide the transition is to coordinate, complement, initiate, and generate projects of mutual benefit for the stakeholders involved. The intention is to initially start with existing projects that have not explicitly been generated by the initiative. However, they are deemed suitable for discussion and expansion within the collaboration arena as the project's research goals and questions are similar to those shared by the collaboration arena (Hellström 2021). Two projects of interest for the collaboration arena, Autumn Leaves/ASAP and Person-Centered Mobile X-Ray are described below.

4.2.1 Autumn Leaves/Acute Support Assessment and Prioritization

Autumn Leaves is an ongoing (as of 2021) project where the goal is to develop a system model for improved detection and prehospital treatment for the societal problem of injuries due to falling. With the intended system model designed to gather information from multiple sources such as homes, medical records, care plans, the prehospital process decision makers will gain rapid access to relevant information which reduces time delays and increases the precision of the necessary intervention (Vinnova 2021). The project has received two million SEK in grant money from Vinnova and 500 000 SEK from the Innovation Platform at Region Västra Götaland and the project partners are PICTA, Sahlgrenska University Hospital ambulance service, Chalmers University of Technology, Health care alarm central (SvLc), Cuviva AB, University of Borås, ImagineCare AB, Raytellingence AB, Telia Sweden AB, Region Västra Götaland (PICTA 2021b).

Injuries due to falls are among the most common and dangerous injuries suffered by elderly people that require urgent medical care (PICTA 2020a). One of the most serious consequences of falling is a hip fracture which alone is responsible for almost 40 percent of the days spent in inpatient care of all diagnostic groups, and it consists of the third largest diagnostic group after schizophrenia and stroke (PICTA 2021b;

Vinnova 2021). The risk of falling increases by age and can be caused by multiple reasons, such as difficulty with walking, balance, ill health, and medication. The problem is exacerbated by many elderlies living alone with poor possibilities to contact emergencies in the event of an injury and therefore often have to wait hours until proper help arrives. The current solutions to this societal problem include safety alarms and smart clocks that can alert a caregiver or a relative in the event of an injury. However, these solutions are currently deemed unreliable and do not offer the quickest and best possible healthcare. There is an apparent lack of connection between different healthcare providers such as ambulance services, alarm management and health care conducted or monitored at home. Autumn Leaves aims to form this connection by creating an integrated information service and an accompanying decision support function for the alarm central and ambulance service. Information can be gathered from different sources such as fall sensors at home and medical records. With data fusion of information and a more clearly defined alarm management, a holistic care chain can make faster and safer decisions on medical intervention on an individual basis (PICTA 2021b).

The project will be carried out in two steps. First, a care process analysis, proposals for technology and a system design will be conducted, which depends on the participating companies' capabilities and competencies in the project. Subsequently, these parameters will be evaluated using personas and use cases. Secondly, based on the previous step, full-scale simulations will be carried out to understand the impact on care processes. Ultimately, the project aims to propose a functional technical solution and verified care process prior to clinical trials (Vinnova 2021).

Acute Support Assessment and Prioritization (ASAP) is essentially a continuation on the same principle of data fusion for acute incidents as Autumn Leaves but not specifically targeted towards fall detection of the elderly. This project takes a starting point in the assumption that the health care transition towards moving health care home will bring forth medical technologies and other equipment for self-monitoring, surveillance etc. to generate data, for example of health markers. Similar to Autumn Leaves, there is a lack of an infrastructure for optimal prehospital assessments in the wake of acute incidents in the growing market of technologies used for providing health care at home. ASAP aims to address that challenge by developing a model that can manage and standardize data from multiple technological sources at home to enable the prehospital care to correctly assess and prioritize an eventual medical intervention at the alarm central (Hellström 2021).

4.2.2 Person-Centered Mobile X-ray

Sahlgrenska University Hospital in the Gothenburg area is currently (as of 2021) in an early stage of testing and implementing a mobile x-ray device which aims at providing the frail elderly healthcare and fracture detection at their nursing home, thus avoiding a stressful trip to the hospital if needed. The x-ray device is set up by an accompanied mobile unit with a nurse specializing in radiology, a paramedic, and its own mobile network (PICTA 2020; Sahlgrenskaliv 2021). Figure 9 displays an image of the handheld x-ray device. The project has received a million SEK in grant funding from the Innovation Platform at Region Västra Götland and the project partners are Departments at Sahlgrenska University Hospital (orthopaedics, radiography, ambulance service and anaesthesia), primary care, community health and social care,

the IT department of Region Västra Götaland, PICTA, the University of Borås (PICTA 2020).

Figure 9: The handheld mobile x-ray device

The process of examination by Mobile X-Ray may exhibit the following chain of care. At first a ‘medical self-referral of care’ is created with multiple care providers and relatives, which details personal medical information about the individual who lives at the nursing home. When an elderly person falls, a nurse in the nursing home makes a first assessment. After that, the nurse contacts the person's primary care physician, their relative and the SOS-alarm which triggers an emergency unit team with the mobile x-ray device. The patient will then receive pain relief pending the arrival of the mobile unit. When the mobile unit arrives, they conduct an x-ray examination and digitally send the images to a specialist physician at the hospital. The physician can then examine the images and conclude that the fall yielded a fracture or not and therefore decide about ongoing treatment remotely. A verified fracture by x-ray image analysis will trigger preparations in the municipal primary care for the patient’s hospital stay and subsequent operation or treatment at the hospital. The patient is accompanied by a relative or caretaker from the nursing home to the hospitals because many patients from elderly nursing homes suffer from cognitive impairment or dementia. If a complete and detailed ‘medical self-referral of care’ exists, relatives or caretakers may not need to travel to the hospital with the injured patient as prerequisite caretaking knowledge already is available for the hospital staff. However, when a physician concludes that an inpatient care is unnecessary, appropriate treatment can instead be offered by the municipal primary care and the regional primary care, which often includes a person-centered treatment plan for continued care in the patient’s home (PICTA 2020; Mölndal Municipality 2021)).

Mobile x-raying patients to diagnose and decide treatment in an individual's home is not a novel implementation in Sweden (PICTA 2020). For instance, it was implemented in late 2008 at Skåne University Hospital and later in 2017 in Region Östergötland with promising results as it drastically reduced patients who needed inpatient care (Vetenskap & Hälsa 2011; Good quality, local health care 2021). The novelty of mobile x-ray at Sahlgrenska University of Hospital is the size of the x-ray equipment, weighing only 3,5 kilograms compared to a traditional mobile x-ray device of 100-400 kilograms. This lightweight device is the first of its kind in Sweden (Westin 2021). In addition to the new equipment, the project aims at creating a new feature for digital cooperation and decision-making process between the different health care providers. This is intended to yield a cohesive and continuous high-quality care (PICTA 2020).

5. Methods

This chapter will present how the thesis was designed. The choice of research design will be presented and reflected upon, while also mentioning how the research went and what tools were used for examination of the case study.

5.1 Research design

Working together with the Chalmers Center for Healthcare Improvement department (CHI), the goal was set to analyze the initiative of MHH through the lenses of transition management and system innovation. This research was then based on a qualitative approach, as the research means to analyze social systems and their relations by using different models of transition management. With that said, the research was more concerned with how the examined sample group, or arena, perceived the world around them more than actual hard numbers and data. Since this project only applies existing theories, a deductive research strategy was confirmed to be more suitable (Bryman, Bell & Harley 2019). The data collection was based on primary and secondary data. Primary data are data collected by the researchers and secondary data are data already collected, compiled, and analyzed by other researchers or institutions (Skärvad & Lundahl 2016). The primary data collected in this thesis was conducted with interviews and a workshop, secondary data was internal documents from meetings within the MHH and also the governmental Inquiry GQLH. The research was then made by applying theory read from literature on the case study, after doing a thorough investigation on theoretical models within transition management and system innovation. Furthermore, the study was made using systematic combining where the research went back and forth between theory and data collection to extend the knowledge by working iteratively (Dubois and Gadde 2002). In combination with the deductive strategy, the research design was regarded as a cross sectional case study, as it is designed to be a field study of a certain group/arena within the initiative of MHH, but each representative is from different organizations and shares their knowledge from their respective situation. As Bell and Bryman (2011) confirmed in their book that case studies usually favor qualitative studies as it tends to give a more in depth image.

The research framing was not made until later stages of the project. According to Bryman, Bell and Harley (2019) it can be an advantage in not having formulated questions early in qualitative research, as they might close off alternative paths that the research might take. As the research continued, and the theoretical framework combined with the interviews had started to take form, it was significantly easier to start sectioning the material into research areas and questions. The interview guide had been grounded on read theory, and gradually a structure for the research came to be after having heard what was important to the interviewees. From there, thorough investigations and iterative research was made, making it possible to combine theory and results for a systematic combining of conclusions.

5.2 Research Process

The research started with an initial meeting with a supervisor from CHI where the initiative MHH was introduced. During this meeting, the idea of system innovation was discussed in whether it would be suitable for this type of arena. Thereafter, a

thorough literature research was done where not only system innovation was read up on, but also transition management.

The research was generally divided into different phases. After the first phase of reading upon the subject, an interview with a professor in sustainability transitions took place. During this interview, more knowledge about the subject was gained as well as ideas for an upcoming workshop. Following the interview, preparations for the workshop took place, which mostly consisted of more literature search in the field of backcasting methods and sustainability transitions. After the workshop the interviewing phase began.

Different actors within the arena were interviewed in a semi-structured manner virtually with a digital tool or in person. These interviews were all recorded and transcribed for the analysis in a later stage. During the interviews, a large amount of qualitative data was gathered, which then led to an extensive data analysis and results being generated. These results then ended up in a conclusions chapter which can be read later on in the thesis. Other than interviewing arena members about the arena itself, the two most mentioned projects in relation to the arena were investigated, namely mobile x-ray and ASAP. Representatives from each project were interviewed for an in-depth image of the projects and then they were analyzed using tools from transition management literature to examine if there was a possibility of using the projects as transition experiments within the arena.

5.3 Literature Study

As a literature review is crucial for any research project, the project started with searching for written works in system innovation. Since the project group had no initial expertise in the topic, the main goal was to acquire base knowledge and to provide a foundation for the research (Bryman, Bell & Harley 2019). The project group started by building an understanding about system innovation in different systems, such as the healthcare system, transportation system and energy system, which later resulted in finding literature on the topic of transition management. This was done by looking into previous studies on the subjects, e.g mainly PhD theses and field studies, where the theme of system innovation and transition management were both mentioned. With time, the group realized the basic concepts and theories within the area. Fairly early, the group found recurring names mentioned in the field of transition management, such as Loorbach, Kemp and Rotmans (2007). This then served to find more related studies regarding transition management, by searching for names of the key contributors. This technique can be described as snowball sampling where more relevant articles are generated for further research by iteratively examining what other papers are cited and what papers cite the relevant articles (e.g snowballing backwards and forward) (Bryman, Bell & Harley 2019). It further resulted in finding more perspectives on the topic on other platforms, such as youtube, where videos of webinars had been uploaded. Later stages of the literature review entailed detailed screening of literature in how to perform backcasting, which was used later in the execution of the workshop. This was done after having a virtual, exploratory expert interview with Professor John Holmberg regarding the subject of transition management. The reason for having the exploratory expert interview was to

gain knowledge within the field the research group still had little knowledge about, as well as gather information for further research. This is a common tactic used in qualitative research (Döringer 2020). Holmberg then mentioned the idea of backcasting that he had used for workshops in the field of sustainability transitions. With this new knowledge, the group decided to read up more on the topic, and to then use it for the upcoming workshop. The online knowledge search was mainly made in Google Scholar and Chalmers Library's database, searching for keywords such as: *system innovation, transition management, transition experiments, backcasting methods and sustainability transition.*

As the first phase of knowledge building had been made, the literature then served as a way to facilitate the interviews and workshop, enabling the group to identify the topic during them. The acquired data could then be used for the analysis and a conclusion.

5.4 Workshop

After talking to John Holmberg, a brainstorming session took place. Originally, the team had planned to only discuss the collective projects that the arena was working on, in the eyes of transition experiments. However, as the discussion proceeded, the idea of using backcasting methods was also decided on, specifically the cruise/expedition logic as described in section 2.6 developed by Holmberg and Holmén (2021). This was because the arena had only met a couple of times in advance and had barely started up. Hence, it became interesting to examine the potential of the arena and give ideas on how to facilitate further cooperation.

The workshop started with a small introduction and presentation of the present members of the arena. Afterwards, the research group made a quick crash course on transition management and the cruise/expedition-logic to increase face validity in the research to ensure that each participant in the workshop had the same base level understanding of the topic. Thus, ensuring the outcome in the workshop was reliable according to the theoretical method developed by Holmberg and Holmén (2021) (Bryman, Bell & Harley 2019). Afterwards, the arena was divided into two separate groups, working on the expedition triangle (as seen in figure 8 below) that had been made for them beforehand. The expedition triangle was slightly modified to make it more clear for the participants to engage with it and thus the phrase 'Challenge to be explored' was replaced with 'Purpose/Vision'. One facilitator from the research team was with each group and helped the conversation stay afloat. The groups got to discuss the four different aspects of the triangle for 20 minutes, and then presented the results to each other at the end of the workshop. The groups were then given the help of a few support questions that the research group had on their PowerPoint to discuss each headline. These questions were:

Purpose/Vision:

- Why are we here? Why are <u>you</u> here?
- What is our common vision?
- What should the arena exist for?

Room:

- What should the arena look like?
- How do we involve and engage all participants?

- What resources are needed?

Process:
- What does society look like today, and what do we want it to be in the future?
- What factors of success are needed to get there?

Leadership:
- How can the arena be led?
- How do we ensure sustainability?

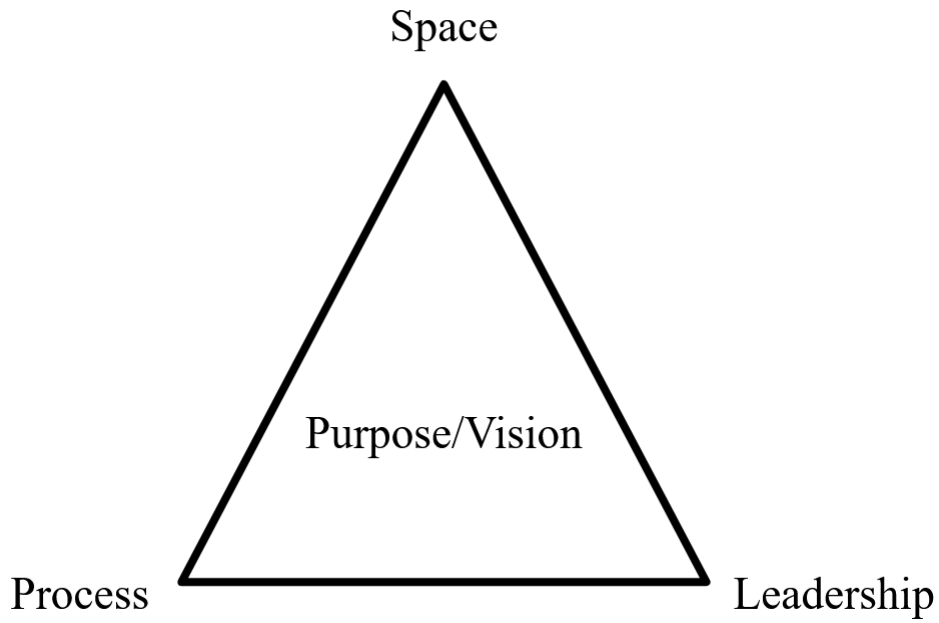

Figure 10: Slightly modified expedition triangle (Holmberg & Holmén 2021)

5.5 Interviews

Following the workshop, several interviews were conducted. The outcome of speaking with the CHI supervisor also resulted in contact with the arena that was investigated. As the research aimed to analyze the arena with transition management models, no specific sampling technique was not essentially needed as there were only a handful of people in the group, so the whole group was asked to participate. This is a non-probability, purposive total population sampling, as the subjects were all chosen in the group for their knowledge and expertise, and the entire group was then selected for interviews by the research group (Laerd Dissertation 2021). Except for a few fallouts, either because they did not have time or did not answer the request for the interviews, most of them were willing to participate in an interview. This resulted in ten interviews. Seven of the subjects were managers in their respective organization, ranging in organizations from Sahlgrenska University Hospital, Närhälsan, Gothenburg Municipality which are the main providers of healthcare in the Gothenburg area. Two representatives were from Chalmers University of Technology from different departments within the university, namely Health Engineering and CVA. One interview subject was also from ‘Tre Stiftelser’ an organization that operates three nursing homes on an assignment form Gothenburg Municipality’s. Lastly, one subject was a quality developer that had been referred to by their manager

to participate in the interview. Their manager was originally asked to participate in the interview but did not have the possibility to partake in it. The interview subject's organization and role are more detailed described in table 5 below with additional information of location, duration, and gender. Every interview was recorded with the permission of each interview subject. The recorded interviews was later transcribed.

Table 5: Interview subjects in the collaboration arena

Organization	**Role**	**Location**	**Duration**	**Gender**
Chalmers University of Technology	Professor at Health Engineering	Digital	60 min	Male
Chalmers University of Technology	Researcher at CVA	Digital	60 min	Female
Sahlgrenska University Hospital	Area manager (Områdeschef)	Digital	60 min	Female
Sahlgrenska University Hospital	Head of department (Verksamhetschef)	Digital	60 min	Female
Sahlgrenska University Hospital	Head of development (Utvecklingschef)	Digital	60 min	Female
Närhälsan	Strategist	Digital	40 min	Female
Närhälsan	Head of primary care (Primärvårdschef)	Digital	60 min	Female
Gothenburg Municipality	Head of department	Digital	60 min	Female
Gothenburg Municipality	Quality developer (Kvalitetsutvecklare)	Digital	60 min	Female
Tre stiftelser	Manager	In person	60 min	Male

When interviewing the arena members formal questions were asked regarding the time limit, their position within their organization and if the interview could be recorded. Next, there were 4-6 semi-structured general questions regarding the subjects view of the initiative Moving Healthcare Home, how their home-organizations view the future, main obstacles, and factors for success for the transition, and if the covid-19 pandemic has had any effect on their transition process. The questions were chosen partially to open a dialogue and break the ice for more extensive and specific questions later. They were also partially made in a way to see if the arena had a similar view regarding key obstacles and factors for success.

After the general questions, about 4-6 more specific questions were asked. These regarded the arena and served as a way to obtain an image of why the interviewee was

a part of the arena, what purpose they had, what they thought of the arena itself and its members, and lastly their future visions for the arena. The choice of questions would then investigate if the arena members had a similar view, or if their purpose with their participation would differ.

All interviews were conducted in a semi-structured manner though the web-application Zoom or in real life at the interviewee's premises. The interviewers could then adapt their questions based on the responses of the interviewees, which often lead to a more in-depth discussion related to either the arena or the initiative itself. Often, the discussions would regard the current issues of the healthcare system and the interviewee's thoughts on possible causes and solutions. As more interviews were conducted, the project group refined some questions to suit the situation better, or because knowledge within the area had already been gained. This meant that, for example, a question on how to build organizational space for the arena was removed, while a question on how to engage the participants more (or to prioritize the arena meetings) was added. This was mainly due to the fact that most participants could not answer the earlier questions, and it had been noted by the project group that they had a slight fallout for each held meeting for the latter question.

Further, there were two interviews regarding the transition projects within the arena. The subjects for there were also chosen by asking the CHI supervisor for contact information of a project representative. They were both key people and project managers within their respective projects and had in depth insight. Their organization and role are described further in the table below 6 along with location, duration, and the specific project The interviews of the project representative were held in a similar manner as the collaboration arena members. Firstly, an opening question regarding the project and its purpose was asked. Partly to break the ice but also as an opportunity for the research group to get a better image of the projects. Afterwards, about 10-12 questions were asked, following a semi-structured format that changed depending on the flow of conversation. These questions were following a model of examining if a project is a transition experiment or not and was taken from literature that had used it in examining projects in a similar manner. Part of the interview was looking at the 9 characteristics of transition experiments, and part of it was concerning the three mechanisms (deepening, broadening and scaling-up) of transition experiments. These two models can be read further about in the theoretical framework section 2.4.5. These questions were later used in the analysis to examine if the projects potentially were or could become transition experiments.

Table 6: Interview subjects for the projects

Organization	**Role**	**Location**	**Duration**	**Project**
Chalmers University of Technology	Professor at Health Engineering	Digital	60 min	Autumn Leaves/ASAP
Sahlgrenska University Hospital**	Operations developer (Verksamhetsutvecklare)	Digital	60 min	Person-Centered Mobile X-ray

Sahlgrenska University Hospital**	Project leader	Digital	60 min	Person-Centered Mobile X-ray

** = indicates one interview but with these two participants

5.6 Analysis

The analysis was divided into two areas. The first one is an analysis on the transition arena's potential on becoming an expedition, and the role it can take in a future system transition. The 10 interviews as well as the workshop were taken into account in this part. The second area is an analysis of the experimental projects the arena has, and if they have the potential of becoming transition experiments. Since the project followed a deductive approach, different established methods from transition management studies were used to analyze the data from the interviews and workshop. These can all be found in the extensive theoretical framework. The workshop followed a backcasting method and was analyzed using this method as foundation. Secondly, the model of transition experiment characteristics, as well as the mechanisms of transition experiments, taken from van den Bosch's (2010) PhD-report was used to analyze the projects and their potentials. Lastly, the outcomes of these two analyses were combined in a shared recommendation on what the arena can do to create system change, and what path the projects could follow to potentially become transition experiments.

5.7 Reflections on the quality criteria of the project

In academic research, one must evaluate the validity, reliability, and replicability of the project, in addition to the ethical aspects of avoiding harm, informed consent, privacy and preventing deception (Bell, Harley and Bryman 2019). These aspects have been taken into consideration during the project process.

With respect to ethics, all interviewees were informed prior to the interviews what the project was about and what the goal was with the interview. They were also asked for consent of having the meeting recorded, in addition to mentioning their home-organizations in the thesis. The interviews were in that sense not completely anonymous, since the answers might give a hint on which representative has answered if one can connect the representative with the organization in the answers. With that said, the subjects were all informed and asked in advance to have informed consent and to prevent deception, and the results as well as the analysis was written in a way to make it as anonymous as possible, making it difficult to guess who said what. It was important to keep the organizations in the discussion, as there might be differences in how the home-organizations viewed the issues, as well as what their purpose of the arena was. This is mostly due to the fact that they have different main providers which have different regulations and policies, perhaps having different ideas on what is important for the change. A second reason for not hiding the organizations, is because the differences in each organization needed to be highlighted in such a manner for the arena to be able to discuss their differences after the results have been shown. The exact wording and answers are not shown in the report either, except for occasional quotes that highlight different arguments. The results from the interviews are written as a collective result, without necessarily

giving out direct information on who said what, in accordance with the aspect of avoiding harm.

In relation to the quality aspects, a few pointers and preparations have been taken into consideration. First and foremost, the ethnography of the participants was considered before asking for interviews. The research group interviewed at least one or two representatives from each big organization, and a few others from smaller ones. This was done with the intention of getting a view as broad as possible for the sake of a good comparison between their respective views and problem statements. The replicability of this study might be difficult, as with most qualitative studies (Bell, Bryman and Harley 2019), as a replication might not be comparable with this original research. The answers gotten by the different representatives were their own experience and view, which might be contrasting to another person's view in the same organization.

Qualitative research is a valid and reliable form of study, however, using the criteria of validity and reliability can be difficult as there is no set numbers or quantity that can be applied. Instead, it can be evaluated through an alternative set of criteria, namely: trustworthiness and authenticity (Bell, Bryman & Harley, 2019). This is set up by the four criteria: credibility, transferability, dependability, and confirmability. Taking credibility into consideration, all the interviewed members were valid subjects as they were key people in their respective organizations, along with that all their factual statements were possible to get references on by either googling or cross referencing with the other subjects that were stating similar concepts. As the research group used a workshop, there is also the aspect of face validity to take into consideration, which provides a commonsense assessment of the findings of the workshop, as well as those of the interviews (Gaber & Gaber 2010). Triangulation of the data was also achievable as the statements within the arena were often similar or the same, but also similar in view to how general media and society states about the healthcare system. This can then also speak for the transferability of the study, as the views can be similar or shared in similar environments. Normally, sustainability transitions are a practice of the energy sector, used more for environmentally sustainable transitions. In regard to transferability, similar studies as this one have been made where transition management tools were applied to different systems and industries, such as the transportation system. van den Bosch (2010) used transition management methods in her PhD-study, not only of different industries, but also of the Dutch healthcare system, in the perspective of elderly housing. Therefore, models of transition can be seen as applicable within the healthcare system, while also being transferable as it has been tested in similar environments prior to this study. As for the dependability, a supervisor from the university has audited the methods and process bi-weekly to ensure that good quality is held for the project. Lastly, the confirmability of this project can be ensured, as the research group only asked for each participant's own views without trying to manifest their own opinions on the topic. This can be seen in the choice of questions in the interview guide, but also guaranteed by the audit of the supervisor during the workshop.

6. Results

This chapter contains all information gathered from the interviews and the workshop with the arena. For further information regarding the interview guide and its questions, see appendix.

6.1 Interviews

In total, 10 interviews were conducted. The subjects chosen were from the different organizations that were a part of the arena. Each organization had 2 (sometimes 3) representatives that were interviewed to get a view as broad as possible. These organizations were Sahlgrenska University Hospital, Närhälsan, Gothenburg Municipality and Chalmers University of Technology. Two of the interviews were conducted before the workshop, which is described in the next section, whereas the rest of them were conducted afterwards during November 2021.

The interview was mainly sectioned into two areas: one general and one more specific about the arena itself. Following are the results of the conducted interviews.

6.1.1 The interpretation and purpose of the Moving Healthcare Home initiative.

The collective idea of the purpose of the Moving Healthcare Home initiative is that there is a need in society for change in the healthcare system. A few subjects pointed out that society is growing older, whereas there are not enough people working in the healthcare sector to take care of everyone. Hence, there is a need to change the work practice of having everyone (specifically elderly) in the hospital for every little thing. There was a division in whether this was an economic question or not. A few of the subjects said that there are not enough resources within the healthcare sector (it can be questioned if this meant enough employees or money-wise), and a few said explicitly that there is not enough money, as it is both expensive and dangerous to send elderly to the hospitals. But then one person said that this initiative is not because of lack of money or to save money in the system, but rather that the healthcare will be more efficient. When talking to representatives from the elderly care sector, they mentioned that it often felt like the elderly could have stayed at the elderly care center for care, as long as a doctor could have either come from the hospital to give advice, or video call for a chat about what to do with the patient. This was due to the fact that the elderly care center felt like the hospitals did not have the time to care for the elderly as much as they needed, so in some cases the old patients would come home in a worse shape than before they sent them to the hospital. They mentioned that they already have staff and nurses taking care of all the patients, so if a doctor could give their opinion on the care given, or what medication to give to the patients, the caregiving could be up to the elderly center itself.

Other than changing practices, there was a great discussion on cooperation between the municipality and the region. This mostly meant between primary care, elderly care and hospital specialized care. The different sectors have different main providers as well as different budgets and roles. All the interviewed subjects agreed that there is a conflict and hinder in working over the organizational borders as they have a hard time communicating and have different perspectives and practices. This initiative

would then force them to cooperate more and change practices in a way that would suit the patient more, as the patient would not feel that they are being in the hands of a new organization or provider. Some representatives then mentioned that they like that the initiative was taken from the university, which could serve as a neutral ground for cooperation between the different organizations that otherwise maybe could feel like they were intruding on someone else's territory. With that said, most of the participants underlined the importance of strengthening the cooperation between the organizations and increasing the communication for better joint operations and problem solving.

Another interpretation was the need of implementing more digital tools within the healthcare sector. One of the subjects said that the health care sector is too slow on implementing technology in their practices, and most of them mentioned that the healthcare system had not digitized much, or as much as society as a whole has. This initiative would then enable the health care sector to use digital tools such as video calls, chat functions or other types of technology to keep giving care on distance while the patient stays at home. In addition to digitization, a few mentioned the need of growing more research projects within health care and to be more efficient in using these in practicality, as well as involving the academic sector in the research. There were a few research projects mentioned that they were using in practicality together, such as mobile x-ray machines and fall-detection devices. As some representatives said, this sort of project portfolio could then maybe increase with the neutral ground where they communicate with each other about issues in the value stream of health care.

6.1.2 Obstacles for the change.

When asked about the obstacles of the change, most of the participants had similar views of the problems of Swedish health care in different aspects.

The participants mentioned the increasing older population as one obstacle, as they do not have enough resources to take care of everyone today, or in the future, having the same work practices as they do now. But, by changing practices another obstacle comes in, which is the difficulty of change. A few of the participants mentioned that doctors are a relatively conservative workforce, and changing their habits was going to be a challenge. One participant mentioned that she had heard doctors sigh and snort when hearing about this initiative. Two other people also mentioned the education system as an obstacle, as the universities for healthcare professionals are not up to date with the practices in reality and come across as old fashioned or conservative too.

The, by far, biggest category that was mentioned was the obstacles in laws, regulations, and management, which was mentioned by all except one participant. As the different sectors of healthcare have three different main providers, the subjects mentioned that there were several policies, practices, and economic obstacles in the way of change. As one participant said: "everyone has different wallets and laws". The healthcare providers in the hospitals are mainly working with HSL (Swedish Healthcare and Medical Service Act) while the municipality care is also taking SoL into consideration (Swedish Social Services Act). Not only does each organization do things differently, but the practices differ between the Swedish regions too, which

affects the healthcare services in each region. Each of the 21 regions have their own interpretation of the regulatory body which impacts ruling and policies, and thus makes it difficult to coordinate or use specific work routines as it might not look the same somewhere else. This was mentioned a few times by different participants, and one participant expressed: “SKR (Swedish Association of Local Authorities and Regional) are having their own race instead of trying out tested solutions”. Another one said, “it is a classical political and regional issue”. Mostly, political issues were mentioned. For example, how the government delegates a budget to the health care sector with a too detailed description on what it should be used on, how a lot of the rules are too detailed in general when it comes to practices and how laws and regulations are made with a too short time horizon. Another point that two different participants, from different sectors, made is that the regions do not conduct external monitoring of, for example Denmark, Norway, or other countries that the participants mentioned as countries with successful practices.

Most participants mentioned the financial aspect, as each organization has a different budget. One participant did not see finance as an issue, as he claimed that they all were working for the same cause, and hence “it shouldn’t be an issue to finance things that are for the welfare of the patients.” Two participants, from different sectors, said that financial management and having certain financial results by the end of the year is not suited for healthcare practices, and therefore is an obstacle when the healthcare system wants to try a new work practice or push money into an experimental project.

Lastly, the lack of digital tools within the healthcare system was mentioned as an obstacle. Not only that they do not exist, or that they are implemented too slowly, but also that the workforce is not prepared to use this, as well as patients (mostly elderly). One of the participants mentioned that she heard about digitizing health care over 10 years ago, and that discussion is being brought up again without any substantial improvements in the field. Laws and regulations are hindering the development of this too as sharing information over platforms is prohibited due to GDPR. This could be an obstacle to the work of having mobile teams as, one participant mentioned: “The teams that go out in the field need support and information to make good decisions in treating the patient. They must be able to contact higher medical competences (with for example video calls etc.). Throughout the health care process, you need a better information system to make good medical decisions.”

6.1.3 Factors for success for the change.

After being asked about the obstacles, the participants were asked about factors for success for the change. Most of the parts mentioned were opposites of the obstacles, such as increased usage of digital tools, more communication between the organizations, changing the current work practices, taking in work practices from our Nordic neighbors (Denmark and Norway), creating a collective forum for collaboration between the organizations and using practical projects in reality.

Other than those, one participant added that there is a need to collect the right capabilities within the organizations and to show the good examples. The idea of good examples was shared with two other subjects that mentioned that it is important to find good, practical examples of experimental changes or projects that are working well in reality. Then, one should communicate about these examples to spread the

idea further. Another participant was underlining the issue of healthcare work practices being too detailed, that management often meddles with workforce practices in a way that they cannot be creative when the situation could benefit from it. Then a driving force could be to let people be creative with their situation and let people learn from their mistakes.

Lastly, the hindering laws and regulations were mentioned once more, as if the policies and regulations would change, it would solve several issues with information transferring and digital tools.

6.1.4 The purpose of the arena and its role in the system transition.

After the first few general questions about the Swedish healthcare system and the initiative MHH, the interviews continued with questions regarding the arena itself. This question was meant to hear each individual out on their expectations of the arena, and why they were in it. Since the arena at this point only had two meetings, some found it difficult to answer what the purpose was. At the same time, some subjects were very clear on why they were there and what their purpose with the arena was. Two participants had never been in similar forums, while the rest of them had been in projects with other organizations before, some in a smaller context and some in a bigger context. The ones that had been in similar forums said that it was difficult to make it work. One pointed out that the leadership was lacking, one said that it was difficult to push the projects forward and out to the organizations, and one said that it was working well until they introduced finance into the project, as money usually stands in the way.

All participants spoke about the arena as a good networking platform, where they could share experiences, ideas and discuss relevant issues they had. One person pointed out that it was nice that it felt neutral, as it made the cooperation easier. In general, many lifted the importance of having a ground for discussing new ideas and maybe being able to create projects with it further on. When being asked if the arena should be more of a radical place, as a frontrunner of change, several backed and said that they did not believe that the arena would be system changing. But several also mentioned that it would be a shame if the arena ended up being just another place to drink coffee and talk, rather than doing practical solutions. A few comments that were made regarding the purpose were:

- “It (the arena and its projects) can’t be too big, but not too small either.”
- “Everything we do will not be revolutionary, but all small things matter. Small streams make great rivers.”
- “We can listen to each other and hear what questions there are. Maybe make something with the things we already have.”
- “The arena should be a motor for research and development projects.”
- “We have to be both frontrunners and a networking forum.”
- “Everyone in the arena has a responsibility. We cannot just sit and talk, we have to move the work forward.”
- “We could be some kind of preparation and evaluation group for projects.”

The answers then ranged from keeping the arena as a pure networking space, only to discuss issues and researching ideas, to making collective projects and using them in practice.

6.1.5 What actors are missing in the arena.

This question regarded the participants of the arena. As with system change, you need different actors and multiple points of view. Currently, the arena consists of the university and healthcare providers from the public sector. Hence, the research group wanted to see if the participants thought there were any missing actors that either could contribute to their work or were needed in solving certain issues or discussions.

A few pointed out that the participants had all been chosen since they were ambitious people, and a few of them knew each other from before. Most of them had a significant role in their organization. And they had kept certain sectors and organizations out of the discussion, since they wanted to be able to have a free ground for discussions with people, they knew wanted change, and to work for change. A few mentioned that it would be good to, in a later stage, involve businesses that perhaps had good technical solutions. This was however often met with a sour tone as "businesses want to make money" and therefore it was a bit difficult to work with them within the health care sector. A few others mentioned private healthcare providers as another probable future participant, as they are working with the same goal in mind, just in a different setting. One said that they might learn from them, as they normally are a little further ahead with implementing new technology and work practices. And another one said that it is good to work with your competitors. Some mentioned that they maybe should invite people from the law sector, or even politics, since there are so many discussions revolving around law and politics. With that said, one person commented "We need to have them (politics) involved since they have the power in this. But I don't know how we would want them involved." One person mentioned that they maybe should invite a person with knowledge of the SoL-laws (Swedish Social Service Act) or people who work with care at patient's homes as the initiative was about taking healthcare into people's homes, which would then be what the home care sector already is providing to an extent.

6.1.6 How to engage the participants and make the meetings important.

After the workshop, the research group heard that people had been slowly falling out of the meetings. Therefore, a question about how to make the meetings important came up. The first two interviewed participants did not get the question as they had been interviewed before the workshop, but all others were asked.

When being asked about how to prioritize the meetings and to physically attend to them, several participants expressed that they do not always have time as they are key people in their organization and have a lot to do. Some of them are part of other projects and processes, which could clash with the meeting the arena would hold. Some of them just said that it is difficult to schedule. The research group then asked about what would be needed for the meetings to have an increased priority. One said that their manager had asked them to be a part of the meetings, which made it easy for them to put the time in as it was regular working time. Some said that the arena needed a facilitator that would engage the group in different ways. A few said that they could divide the arena into groups and discuss the different matters or have

themes where they get to discuss different agendas. That way, they would want to be there as the question would be important to them. One said that they could have assignments to present to each other every time they would meet: “Then you get to do something and not just sit and listen all the time”.

Other than engaging the group, several identified that they need to have a concrete goal and agenda for the meetings moving forward. One said that they needed to make the group specific, as in what the idea with the group is. Another said that they need to define what they are going to do, as otherwise people would not continue coming. One said earlier in the interview that they were worried about the meetings becoming mostly talking without action, and that there was no specific gameplan in how the change was going to be made. That person said later: “I think it’s going too slow. We have identified that the change is not made in an afternoon, so we have to think about how we are going to do it”.

6.1.7 How to finance the arena.

This last question was divided within the group. The research group asked if the participants thought that the arena should be financed in any way, or if they would apply for financial support when they needed it (for example for projects or similar activities). Three people were against the idea of the arena having its own finances. Some comments that were made by them were:

- “In that case, you would start building a bureaucratic organization. [...] I think it (the initiative) dies with money.”
- “I don’t want to put emphasis on it (money). [...] Everything doesn’t need to cost money.”
- “With money it becomes too controlled. Money is power, and who is going to own the money in that case?”

A few said that they were unsure what they would like. One said: “Let’s say we have money on the table, enough for one project, but we have three projects in the group. Who gets to decide what we put the money on or how we prioritize what is important?”. Another one said that they needed to discuss it in the group to know where to put themselves financially, as there are options to having their own money.

Most of the group, as well as the ones being against financing the group, said that they could get money from scholarships, funds or other places (like the Innovation Platform at Region Västra Götaland and Vinnova) if they needed money. It would all boil down to what projects they would create, if any, and how much money they needed. There was also a discussion that each organization could push in some money if they found their projects relevant. One participant said: “At first, maybe Chalmers could push in some money for the start. [...] Then as the project grows the organizations could add to it. If it is a pure research project, maybe it is up to Chalmers. If it is more about how to build the healthcare organization then maybe they should pay for it”. One participant also said: “We need to have some foundation financing to be able to start basic projects, and then search for more long-term financing”. A few participants also pointed out that it is difficult to get money from each organization in joint projects as they would not know who is responsible for the project, or which organization owns the project.

6.2 Workshop

There were 10 participants in the workshop (2 from the research group, 3 people from Chalmers, 2 people from the Gothenburg municipality, 1 from Sahlgrenska University Hospital, 1 from University of Borås and 1 from Närhälsan). The workshop started with the research group holding a crash course about transition management, and then presenting the backcasting method. The participants were divided into two groups with 5 people each (each group had one person from the research group as a facilitator) to discuss. The research group had, prior to the meeting, made triangles with the headlines "Purpose, Room, Process and Leadership" on two pieces of paper. These were then given to each group for support in their discussion. The groups were then given 15-20 minutes to discuss each headline with the help of a few support questions that the research group had. These questions can be seen in the methods chapter. After the discussion, each group had to write on the paper what they had collectively decided, and then present it for the other group.

6.2.1 Discussions within the groups

A lot of the conversation revolved around their common issues, such as: problems with sharing information over organizational borders, political laws and policies that are in the way of change, and the fact that more healthcare will be needed in the future (due to increasing age in the population) while not having enough resources or staff to be able to meet that need even today. The facilitator several times asked one of the groups to point up the different answers they had for the triangle, but there was much information that was discussed between the participants regarding common problems, so they did not have the time to fill out all the answers in the end. They agreed that there was a pressure in society to change, and that they needed to help each other out to be able to make the change happen. One of the participants had earlier shown a video about digitizing society which was made in the 70s. They avidly referred back to it during the discussions as "We cannot let the same thing happen, where we talk about something, but it does not happen in reality. We cannot wait another 30-40 years before we digitalize". They each brought up different examples of issues they were having in their respective organization and how there are obstacles to getting a firm solution. Both groups agreed that they needed to work together, since they were working in the same arena by helping patients, and that they needed to decrease the usage of resources. They discussed the possibility to bridge between the organizations, by using resources and staff in a new way to involve the different organizations. For example, having doctors in video call to elderly care homes where the nurses there can take part in the discussion, for them to be able to help the patient in the best way possible. One participant said "The change cannot be made by (small projects) like this. But rows of these examples can fill the silos". Then they discussed what the arena should exist for. Is it only for chatting? Is it to present different projects to each other? Is it to make their own projects? As they continue chatting, one said that their worry is that the arena will only be a place where they chat, but nothing concrete happens. They then talked about the need of having clear communication between the elderly care, primary care and specialized hospitals to reduce people going to the hospitals for small issues that can be taken care of at home. They were divided in that some people put emphasis on technological solutions to some problems, while some were more into the idea of discussing and networking with each other to stream information. Lastly, one person mentioned how to make the

meetings important and that you "should make time for it, not only come *in case* you have time for it".

6.2.2 Presentations

After the discussion, the groups presented their triangles. Their conclusions have been translated into English below:

Purpose/Vision:

- Cooperation
- Spread information
- Unite about obstacles that must be removed
- Create and share projects
- "Make sure the transition succeeds!"
- Possibility for individuals to be individuals and to own their life from the day they are born.
- No having to be a patient.
- Local and concrete solutions for the "how's" in the daily life of the individual.

Process:

- Collaborate between projects
- Share information
- Dissemination of information between the "silos" to prepare ground for commendable development projects
- Development projects - also improvements of projects locally → spreading of knowledge more "informally"

Room:

- Want to participate and prioritize the meeting
- Nice atmosphere and creativity in the room
- Has an arena in their own organization

Leadership:

- Neutral arena with an active leadership
- Long-term survival
- Allowing
- Create room for cooperation, reflection, experiments, and learning

During their presentation they stated that the most important aspect is that they collaborate and have good dissemination of information. They said that they needed to agree on what obstacles they see, and share information about new ongoing projects. They mentioned that the main obstacle is an increasingly older population and that more people are patients living at home. Then one participant said that they want the transition to succeed and that the things they do within the arena should be in accordance with that goal. The participant also said that it was important that they do not just gather people to have coffee with and to have a plan for how to finance the arena in the long run.

The participants also had a lot of focus on the idea that the individuals should live their lives as long as possible without being patients. They also put emphasis on

having concrete projects, so the arena is not too fuzzy. They wanted the leadership to be learning and reflective. It was also important to them that the participants made time for the meetings, and that the atmosphere was creative and open. They also said that it was important that each participant then disseminated the ideas from the meetings to their own organization, as it would not spread otherwise. One participant jumped in and said that it is important that they define what the need is for the change to happen, as it is not only a university hospital matter. Another participant said that they were worried that they would be met with "we do not have enough resources" from their own home organization when trying to present the ideas. Lastly, one participant underlined the importance of working together on different levels, so the projects do not become mere islands of excellence.

6.3 Projects and Experiments

During the time the interviews were taking place, the research group heard about a few projects that were ongoing. Two of these were mentioned several times, and the research group decided to analyze the projects to see if they were, or had the potential in becoming, transition experiments. This was done using van den Bosch's (2010) model of the characteristics of transition experiments (starting point, nature of the problem, objective, method, perspective, learning, actors, and experimental context) as a basis, while also asking questions related to the three experiment mechanisms (deepening, broadening and scaling-up). Two interviews were conducted with representatives for the two projects and following is the information given during the interviews.

6.3.1 Autumn Leaves/Acute Support Assessment and Prioritizing

Acute Support Assessment and Prioritizing (ASAP) is a project revolving around information sharing for a more effective emergency care. The interviewed representative said that it all started with it being a project for detection of fall accidents in patient's homes. As the project went by, they later saw the potential in it becoming more than just fall detection.

1. ***Starting point and nature of the problem***

The subject was asked to present the project and how it came around. They said that the idea started with that they had understood that fall accidents were a big societal issue. Not only was it dangerous, but also costly for society. It would take a long time before the accidents were detected, and some people would even die from it later on. This meant that the time window, in which successful surgery or treatment could be made, would pass before the accident even was discovered. They then decided to make a project to optimize detection and assessment of fall accidents. After a while, they had started wondering if they somehow could apply the same idea to a broader application area. ASAP was born, and with it came other projects, such as optimizing assessments of trauma accidents or stroke cases. They could prioritize and make risk assessments even before they got to the site by using data fusion, taking information from machines in the patient's home. This would be possible with the shift in having more monitoring at home. It would then, hopefully, improve and optimize the emergency care chain by obtaining more information faster. Along this road came a few obstacles. The subject said that there were several issues with flow of information and interoperability within the healthcare system. Different providers have different

interfaces, flow of information, policies and rules which are affecting the project. The subject said: “Two weeks ago, the evaluation report about the Swedish e-health policy came from the State Office, and they criticized it heavily. There were many things about standards and interoperability that they cannot successfully operate centrally, which is crucial in utilizing IT- and decision support to share information. That is also a part of this project. It is key.”

2. Objective and perspective

It was understood that the project team had made a model for how they were going to go about with the project, called VHIPS. This model had a time perspective of about 5 years and the ASAP team had recently hired a PHD student to work on part of the project as a part of their thesis. The subject was asked if they thought the project could perhaps change the culture and work practices within the Swedish healthcare system. When asked this, the subject said: “Yes, I think so. At the same time, it is not a coincidence that me and [name] were talking about system innovation. It is not a sole project that can [create system innovation] on its own. We cannot alone make the world change, and we need to find a way to do it together. To plant it and get it out. It is required to take a look at it and find the runway, because it is not yet ready to be received. How can we work parallelly in a way that the solutions can land in a good way? When working with digital health, and similar system innovation, it is also both technical [...], but also it is important to spread it. It is difficult.”

3. Method and experimental context

The research group asked the subject about how they work with the project generally, and how they are conducting their tests. The subject then said: “We have mostly been doing lab work while moving forward. Corona made it so we could not meet each other, but the things we developed during the journey were not what we thought they would be in the beginning.”

The subject also mentioned that they have been creating patient personas, together with the help of the municipality and the alarm center. They are following up information regarding patients and their distinctive needs to be able to have tailored solutions to what is actually needed. Regarding the testing, they had yet not come to that stage, but the subject said: “The thought is to gradually pull it out to reality and try it, eventually, with real systems. But first we are looking at how the infrastructure is working and how one could do simulations in a computerized environment to see how one could exchange [information]”.

4. Learning and actors

For transition experiments, it is important that the projects have multiple actors, and the focus of the project should be learning. A few questions regarding learning and actors were asked, and the subject named multiple actors, within different industries. These were in the telecom industry, different tech companies working with monitoring, companies working with radars, another working with airbags for cars etc. Moreover, the subject had also mentioned cooperation with the municipality and the alarm central for information regarding patients. Since the subject had earlier talked about how it had been difficult seeing each other due to the pandemic, the research group asked about how they worked with feedback and learnings throughout the project. The subject then said: “We have handled it in different ways. We have actually written in our application [to the innovation platform for funds] about how we are going to do it [work with feedback] horizontally and vertically. [...] We have

been having workshops, which has been important, and program conferences where we share our knowledge in a concrete form. A part of it has been when we have done practical demonstrations and simulations. Then everyone has to be there, and you get to discuss things in a broader forum than otherwise to be able to further build and create understanding all the way. When you create a scenario that includes everyone, then everyone needs to be in the conversation. It is an important part of the learning process. And otherwise, it is the old way of documenting and attending conferences and similar occasions."

5. Managerial activities regarding Deepening

Deepening includes actions that are aimed at learning as much as possible from the experiment. The subject said that it has been hard to get all the learning outcomes from the companies that are involved in the project, as they rather not let go of their "secrets" and how they have been working on their parts of the projects. It has also been difficult to give good feedback because of the pandemic and the issue with not being able to meet as often as they wanted to. But the subject also mentioned that while it was difficult, they had the opportunities to meet for conferences, demonstrations, and workshops where they could share knowledge on their parts, technology, or learnings from experimentation.

6. Managerial activities regarding Broadening

Broadening is known to be the actions that aim to apply the project into other contexts. The subject themselves mentioned the mixed application of the project already during the initial presentation of the project. They mentioned that the project was now applied within stroke and trauma handling, where information was needed quickly. This way, the ambulances would be able to get a history of the patient, and possible health issues, even before they would arrive at the site. The ambulance would also be able to find the closest primary care center in case they needed to have emergency care immediately. This would also be beneficial in more remote cities that have a wider stretch between the different hospitals. Further, the subject also mentioned: "It has also led to a fourth project that is called digital health sandbox, which is a testing environment for closing the gap to reality for different e-health solutions." When the research group asked if they were trying to implement knowledge from other domains than their own the subject said: "I don't know if we have. We are interested in the areas we are working on. There is nothing structured or strategic we are doing, but we are trying to collect people that think this is exciting and want to learn and share. You can do a lot if you build groups of capable people."

7. Managerial activities regarding Scaling-up

Lastly, for transitions to happen it is important that the project can scale in a way that it gets embedded and changes the dominant ways of thinking. The research group asked the subject if they had any thoughts about scaling the project and how they were going to spread the idea somehow. The subject then said: "Yes, well, it is what we have been working on. We have succeeded before through history to raise good things from ideas to companies that have affected how healthcare is being run today. A part is that you have all parties with you all the way." The subject mentioned that they already have started making a work-process for the stroke unit together with experts in stroke, where they have conversations with the ambulance while examining the patients to save treatment time. This work process is already being tried out with 12 different cars running this way. The idea is to try to do a similar experimenting

process with the other project parts as well, where it slowly is going to be tried out and hopefully implemented as a practice. When asked about how they had thought about doing it concretely the subject said: “[...] We must start with seeing that it is as useful as we think and hope. Then we can do it gradually. The further you go in the process, the more important it is to look at the business model, scaling-up, how to run it and responsibilities. It becomes more important the further it goes”.

6.3.2 Person-Centered Mobile X-ray

Person-Centered Mobile X-Ray is the other project. This project is in an early stage of testing and implementing a mobile x-ray device which aims at providing the frail elderly healthcare and fracture detection at their nursing home, thus avoiding a stressful trip to the hospital if needed.

1. ***Starting point and the nature of the problem***

The project ‘Person-Centered Mobile X-Ray’ started off as an application to an innovation fund regarding quality-driven organizational development. The initial idea was centered on the overall healthcare transition in Sweden and the research question began to formulate around the topic of informational flow between patients and medical expertise. Specifically, the subjects said, “How can diagnostic information or other information connected to diagnostic assessment of patients in a care room outside the hospital flow to medical expertise (e.g., in a hospital) for them to be able to participate in assessment and decision regarding a patient which is physically distant from them (the medical experts”. Exactly what part of diagnostic information flow was initially not determined by the project group, blood analysis and ultrasound tests were also considered plausible from the beginning. However, by sheer coincidence of the external events such as the COVID-19 pandemic and delayed government procurement, x-ray examinations became the appropriate diagnostic information to retrieve outside the walls of medical facilities. The subjects explained that x-ray examinations are suitable for this type of project as the general public often can relate to x-ray examinations and images as it is one of the most displayed medical examinations to the public, both in their personal lives and in popular media.

Using a mobile x-ray machine to conduct examinations outside the walls of medical facilities is not a novel idea as it has been done before in Lund and in Region Östergötland. The subjects respond to the specific novelty of this project, “Traditionally, mobile x-ray examinations have been scheduled in advance. We wondered how we can connect the examination to emergencies and an emergency flow, so we enable the possibility of a patient being cared for at home instead of an ‘unnecessary’ trip to the hospital’. The target group for our project naturally came to encompass the fragile elderly population and specifically in nursing homes”. Furthermore, according to the project group, exactly what type of diagnostic information or technology which enables the information to be captured and transferred was not the primary focus from the outset. A persistent societal problem is to coordinate many actors in the healthcare sphere to arrive at good solutions for the individual. This project aims also at exploring this problem with involving all actors at a system level in the implementation of the mobile x-ray.

2. Objective and perspective

The project has from the outset aimed towards contributing to the healthcare transition. As the subjects say: “We are constantly aiming to enable continued care at home. It is our foundational pillar in this project. We should not do things outside the hospital that we still need to do elsewhere. Regardless of if it is ultrasound or blood analysis, the purpose should be that the system shall allow for the continuation of care at home. That is the main purpose, and it has often proven to be fruitful at least to some patient groups. You can move medical specialist competence in other ways than you can transfer patients to the hospital”. In terms of perspective and longevity, the project group is hopeful and maintains a position that this project will survive the official project timeline. Eventually, the attitude is that the project will deliver an excellent service so a termination of the project would be unthinkable.

3. Method and experimental context

The project group gathered the healthcare system in a nursing home that revolves around emergency responses in a potential hip fracture. They started off with co-creating a detailed blueprint description of the present response from all the actors if an elderly person falls. After a present description was established, they placed an x-ray device in the nursing home and asked, “What happens now?”. The process of envisioning a future state involved multiple aspects to consider, from operational to strategic. For example, what happens when a patient does not have a fracture (determined by the mobile x-ray examination)? Can the healthcare providers as a cohesive system ensure a continued good recovery? As a result of this project, the implementation of the mobile x-ray should most importantly create value for patients and their relatives. In addition, stakeholders and actors from the healthcare system who are cooperating in this project should all feel like this system is valuable for them. The subject concludes with saying, “The outcome should be to create a collaboration between the municipal and regional healthcare to create value for ourselves but most importantly the patient”. The project takes place in a real-life context at nursing homes in Region Västra Götaland. It first started off with 3 nursing homes and 3 health centers associated with each nursing home. By year 2022 the goal is to have expanded the project to 20 in total nursing homes (health centers unknown).

4. Management activities regarding ‘deepening’

Activities regarding deepening are aimed towards learning as much as possible from the experiment in the specific context. In this project, the project group established a ‘learning room (läranderum)’, to specifically learn about the healthcare system surrounding hip fractures and the emergency response. The subject recalls that this technique was gathered from England and the department of quality-driven organizational development at Region Västra Götaland had started to use it three years before the project started. The project group embraced this technique of creating a learning room for this project. This technique is centered around gathering the healthcare system (including the patients and relatives in the same room) and with a positive approach identify areas where the system does well and areas where more development is needed. In this process, the patient’s needs were central and what is the system able to do now and what should it be able to do later. Usually, this is conducted by narrative storytelling from multiple perspectives, both from patients and the actors within the healthcare system. Tools used are the AIM-method, fish-diagrams etc. To help administer the process and to lead discussions, the project

group hired an external consultant specialized in service design. The project group said that this helped them to bring in a new perspective: “She was also from the private sector. She had a customer perspective in a whole different way. It is easy to forget that it is actually services that we deliver. She had a customer perspective as the bearing principle in this, ‘the customer’s journey'. In the project group’s perspective, one should not be able to start a project without creating a learning room in Region Västra Götaland. “You have to do your homework before you can start a project and receive external funds, learn about who the changes and the projects encompass”.

5. Management activities regarding ‘broadening’

Activities regarding broadening are aimed at repeating the experiment in other contexts or connecting to other functions and domains. As earlier mentioned, the project was initially not restricted to radiologic technology as the mobile x-ray. Thus, the idea of connecting diagnostic information flow from specialized medicine to patients in their home is multi-functional, as it could be reproduced (albeit it would require a new project group) using ultrasound or blood analysis. However, the notion of using the actual mobile x-ray device in different functions other than hip fractures in nursing homes have been limited. There is an ambition under 2022 that if some other part of Region Västra Götaland wants to try the same concept they will receive help and funds for that. In terms of other domains, one project group member mentioned that using it in the Prison and Probation Service would be a viable function to test it in. It requires a tremendous amount of resources to transport injured incarcerated inmates to the hospital to potentially diagnose and treat a fracture. The subjects did however emphasize that this project has generated interest at a national level, specifically their efforts of trying to collaborate with multiple healthcare providers. Healthcare providers in other regions have reached out to this project group and want to learn how Region Västra Götaland has handled this collaboration (which is no easy task). The project group is then hopeful that during these discussions more ideas will form about how to further this project.

6. Management activities regarding ‘scaling-up’

Activities regarding scaling-up are aimed at embedding the experiment in the dominant structure, practices, and culture. The project group admitted that the subject of embedding and scaling-up the project in the dominant structure of the regime was prioritized in the beginning. It again reached the surface as an important subject as the project received financial funds from the Innovation Platform at Region Västra Götaland for 2022. At the Innovation Platform, implementation and distribution are important aspects for their innovation process (although these aspects are not emphasized in the application). The project group has recently begun the discussion about who should be responsible for continuing with the ‘Person-Centered Mobile X-Ray’ not simply as a project, but as an integrated part of the healthcare system’s response to hip fractures. To accomplish this, the project group hopes that the service (of mobile x-ray) will be implemented at several nursing homes before the project ends so the amount of nursing homes forms a critical mass, so it becomes unthinkable to abandon the mobile x-ray. This is of course dependent on whether the project is beneficial for the patients and relatives, but also for healthcare providers and the society at large. One aspect of this project has been the ‘learning room’ and it is the project group's intention to help spread and embed this technique when this project is replicated in other contexts in Region Västra Götaland. The project group argues that

the learning room is not limited to hip fractures, but it could be useful to implement when learning about other examinations and healthcare processes.

7. Discussion

This chapter contains the discussion and analysis, combining theory and results. Each headline is following the three research questions that were stated in the introduction.

7.1 What are the main success factors and obstacles within Swedish healthcare in Region Västra Götaland?

The subsequent two sections describe the factors for success and obstacles in the Swedish healthcare system towards the transition. Thus answering research question one.

7.1.1 Factors for success

Removing the focus form hospitals and shifting it towards primary care

As known from the case study, Swedish healthcare has largely focused on specialist and emergency care, leading to a lacking primary care. This, and a shift in the demographic, has resulted in that there are not enough resources to ensure good quality healthcare in the future. The reform of GQLH is therefore mostly taking primary and prehospital care into consideration for success factors, to make space within the hospitals as well as re-distributing the resources. These two perspectives (shifting demographics and focus on emergency care) could be analyzed through the MLP tool. Geels (2019) particularly addresses shifting demographics as a slow-moving landscape (macro) development which ultimately forces the socio-technical regime, which is in this case the healthcare system to alter its current structure. The structural changes in healthcare will be significant especially due to the longstanding exaggerated focus on the specialist and emergency care. The analytical MLP tool can help healthcare decision makers to categorize developments according to their origin of either macro-, meso- or micro-level to help understand the transition as Geels (2019) have emphasized.

Proactive care and interprofessional collaborations

An alteration in proactive care has also been mentioned, focusing more on health than treating illnesses before they happen. It was clear during the interviews that the participants predominantly agreed with the inquiry of Good Quality, Local Healthcare (GQLH). They were underlining the fact that there is a great need for multi-actor and interprofessional collaborations within the healthcare sphere, as well as shifting into a more patient centered healthcare. The multi-actor and multi-dimensionality of the healthcare transition is an essential part of what constitutes a transition from a theoretical perspective. Mark, Raven and Truffer (2012) explains a transition requires a re-conceptualization of how a certain societal need is fulfilled. Therefore, the transition towards providing healthcare outside the hospital walls requires a conceptualization of multiple dimensions that may be affected by the transition such as a multi-actor perspective mentioned from the interview subjects. This way, there will be less friction between the different main providers that overlap, as well as letting the patients with complex health profiles acquire the best care possible.

Digitalization which permeates structures, practices and culture

Mostly, the interview subjects emphasized the importance of a new infrastructure and digitalization as a great success factor. Digitizing healthcare is of great importance

when transforming the modern healthcare service to be more effective, but also reaching further. The subject of digitalization is a recurring theme and it is one that requires a substantial shift in the major aspects of what actually constitutes a transition, as van den Bosch (2010) explains, in structures, practices and culture. Structurally, digitalization needs to be supported by a vast change in physical structures to allow for diagnostic information to be digitally transmitted from outside to the hospital. For example, digital logistical solutions were similarly mentioned by the interview subjects and in the inquiry, with focus on video calls, mobile health care and patients refraining from going to the hospitals by using self-care and monitoring at home. These aspects are addressed by the projects attached to the collaboration arena (Mobile A-ray and Autumn Leaves/ASAP). van den Bosch (2010) further explains that practices must be adopted to cater the structural changes. In other words, who should practically carry out the task now created by the structural changes. This has been a point of discussion from multiple main providers of healthcare in interviews and the workshop. When a digitalization of a diagnostic flow of information is being introduced outside the hospital walls, who is responsible for the care-chain and the practices? Pre-hospital care? Municipal primary care? Regional primary care? Specialized hospital care? As the transition progresses forward a lot of discussion will likely be centered around this accountability issue. Lastly, van den Bosch (2010) explains that a cultural shift is needed as well. Digitalization will require that both patients/relatives and the care providers shift their perception about how healthcare can be provided. Interview subjects have mentioned that often healthcare providers are tethered to an in-person meeting with patients. Digitalization will force away this perception. To conclude, digitalization will force structural, practices and cultural changes and it provides a valuable entry-point for the transition for the healthcare decision makers aiming to influence the transition.

Sustentation of competence relies (at least partly) in a cultural problem

Monetary resources on one hand, the issue also lies in keeping personnel and competence within the healthcare system. This was mostly mentioned by participants from the municipality, as they experienced a difficulty in recruiting and sustaining competence for elderly care. According to their interviews, the elderly care and healthcare within the municipality is seen as mundane, in comparison to work at the hospitals where the "action" is. This was partly recognized by primary care participants too, as well as the ambulance unit, where they found it difficult to motivate personnel to use ambulances more as a mobile hospital, rather than attending to emergency trauma cases. To reiterate, van den Bosch (2010) specifies that for transitions to happen, there needs to be a cultural shift. As interview subjects have noted, the transition towards providing healthcare closer to home requires a culture journey. Currently, most of the concern comes from municipal primary care. However, as the demographic shifts and the healthcare system is gradually treating more and more elderly patients, regional primary care and hospitals will have to find ways to keep competence and workers to ensure a successful transition.

Education and research must come along for the transition

Only a few mentioned the educational system, research, and development. Those who did, however, mentioned that there was a gap, where the education was lacking and conservative, resulting in newly graduated healthcare personnel using old methods or knowledge during their work practice. The research, development and education has been mentioned in the GQLH inquiry as a success factor, for anchoring the new

cultures and the practices in the transitioning healthcare system. However, the anchoring of new cultures and practices should be supported by a new structure. van den Bosch (2010) explains that institutional structures are the immaterial fabric of society, which in this case also encompasses educational and research institutions. Updated curriculums, new research departments and programs are examples of ways to change the institutional structure. A good example of emphasizing healthcare in education is the new program 'Medicinal technology' at Chalmers University of Technology (Chalmers 2021a). If there is an existing gap between actual work and education, then inviting the educational community into the arena might be of interest. Both for the sake of transitioning while including them, but also to decipher the reason for the gap itself.

Collaboration with a multitude of actors and across dimensions

Collaboration with actors outside healthcare is also referenced in the inquiry as a success factor. Throughout the course of the interviews, this was somewhat frowned upon when it came to collaborating with private businesses, while other fields were not in any way mentioned. The inquiry is stressing the fact that preemptive and active self-care is stretching beyond the healthcare system, but in this instance, there are no participants in the collaboration arena outside of the established system. Yet again, Mark, Raven and Truffer (2012) emphasizes the reconceptualization of a fundamental shift in the fulfillment of a societal need in the face of a transition. Here the interview subjects have at least an initial distrust of the private sector and other fields are not mentioned. This may be a limiting factor for the success of the transition if the other fields are not involved extensively. For example, private medtech companies, school systems etc. The idea of this healthcare transition that stretches further than just the healthcare sphere and into other aspects of people's daily life was however brought up in a workshop discussion. As Mark, Raven and Truffer (2012) would describe, clearly this transition is not constrained to a single dimension and there is a need for a multi-actor and a multi-dimensionality perspective for this healthcare transition.

7.1.2 Obstacles

Lacking system knowledge

A point of emphasis by both the Inquiry and interview subjects is a clear lack of system knowledge, and the fragmentation in national standards. The health care system and its providers have evolved for centuries, leaving the system decentralized and complicated to really grasp from a holistic perspective. This means that the task of change will be highly demanding and require complex steering. As Geels, Elzen and Green (2004) suggests, the complexity at the system level is not reduced to a single dimension, like technology, but it is the collection of technical, social, cognitive and institutional dimensions. Thus, relating to figure 3 to greatly improve a system's efficiency requires innovation at the system level. The lack of system knowledge may greatly impede the transition towards achieving system innovation across multiple dimensions in healthcare. An excessive focus on a single dimension (e.g. technology) may miss equally important dimensions such as the institutional barriers. The result would then be according to Geels, Elzen and Green (2004) a partial redesign of the system or a system optimization, which would be subpar to the promised efficiency of a system innovation.

Lacking standards and obstructive legal frameworks
One interview subject was critical about the lack of national standards within the healthcare system. The difference in legal frameworks, the difference in standards and the lack of overview makes it challenging to assure the same quality healthcare throughout the country as it will result in variances depending on where you live. The decentralized and fragmented healthcare system is largely at blame, but the differences seem to vary even within the regions as one interview subject pointed out. Rural communities exist even within a populated region like Region Västra Götaland which places further emphasis on just not transitioning towards a modern healthcare, but healthcare should be accessible and equitable. To further the idea of differences, one significant obstacle for the transition relies within the legal frameworks in which the different main providers of healthcare operate according to. Municipal primary care uses SoL as their primary legal framework and regional healthcare uses HSL. The interview subjects have given varied responses about the clashes in legal frameworks when the two organizations interact with each other, a few saying that there are ways to work around legal rigidity and others saying it is very difficult to do so. According to Geels (2019), this can be interpreted as an institutional lock-in mechanism where the system and actors within the system favors certain existing regulations and rules. As the transition progresses forward, the prevention of institutional lock-in will likely be a great challenge as the organizational and accountability demarcations between municipal and regional healthcare are closer drawn when providing healthcare at home.

Political and geographical myopia
Another threat for the transition is the lack of persistence for the change, which will leave high responsibility in the hands of leadership. The persistence has, as mentioned in the case study, resulted in many unsuccessful reforms in Swedish healthcare. This is also mentioned by another participant in the arena as the short-lived political decisions cannot change anything, as they will have too short of a time to make any change that will actually stay implemented within the system. Transitioning would mean that the political changes would have to be sustained over several mandate periods, holding the policies made alive for a long time to break current culture, structure and practices. This relates to Geels (2019) explanation of a political lock-in mechanism (similar to institutional lock-in) where political actors are not truly incentivized to sacrifice political short-term loss against a successful long-term transition in healthcare. Persistence in the political sphere may be a great obstacle. A few participants criticized the decision in not applying and implementing already existing solutions from neighboring countries, such as Denmark and Norway. There are a few dissimilarities between Swedish healthcare and their system, however, it should be very possible to examine and possible pick and choose solutions that have been tested. Perhaps it is the pride in wanting a unique solution and system that lies in the way, as one participant expressed it, nevertheless it could be an option to look into, examine and feasibly implement from. Maybe it could even be a foundation in how the arena could work, by making market analysis and comparing how other countries have solved allocating resources, spreading information, keeping competences etc. within healthcare and using it in future projects.

Changing the culture and striving for inclusion
Changing culture is not directly mentioned in the GQLH inquiry, but the arena participants were expressing their worries about the conservative workforce that will

have a daunting time changing their old methods for new ones that are more aligned with the envisioned future healthcare system. Geels (2019) explains that an obstacle to a transition is social and cognitive lock-in mechanism, where actors within the system exhibit a mental rigidity towards a change that a transition would imply. These groups tend to also have significant social capital to leverage if the transition is deemed not to be beneficial for them. One example is an union organization for nurses (among others) who have opposed a transition towards moving healthcare care home unless their needs are catered to (Vårdförbundet 2014). With a strong leadership it would be possible to change behaviors, although the leadership skills and knowledge within the system has been brought by the inquiry as another obstacle. To solve it, there is a need to educate current leaders, which is something that one participant in the arena also mentioned, on how to lead in change and complexity. This would also be enabled easier with a joint vision from political ideologies and national standards to lean on. Another thing the inquiry emphasizes is the lack of inclusion of all levels within the healthcare system and that the current healthcare system excludes marginalized groups. They were not mentioned by the arena participants but could be argued for why. The arena is not by definition looking into alternative solutions for people with cognitive hinders or physical disabilities that perhaps cannot use the increase of technical solutions or self-monitoring at home. The idea is to have a broad mind in how to enable the transition by different projects, and it will be difficult to scope everyone into those projects. Regarding the inclusion of all levels, as the arena are people with medium high positions, with enough overview both upwards over the system, as downwards into their own organization, they can be key to involving more people both ways. In that sense, that subject is relevant to the arena and might be something they can help settle into the modern system. One participant did slightly mention this in their interview, and how it could be crucial to include everyone if change was going to be accepted and happen.

7.2 How could transition management be applicable in Swedish healthcare, specifically within the initiative of ‘Moving Healthcare Home’?

Two central inputs are used for discussion. The first is the theoretical background of transition management and more specifically the transition arena which acts as a framework or guiding influence for discussion. Secondly, the findings and general observations from interviewing participants in the collaboration arena and the collaborative workshop which was specifically aimed at coproducing conditions the collaboration arena should be predicated upon. The discussion will start off with a section on if transition management is appropriate within the Swedish healthcare transition. Subsequently, transition management principles and areas such as the leadership in the arena, composition of the arena, participants of the arena, activities in the arena and more.

7.2.1 Transition dynamics and management in Swedish healthcare

Transition studies since its inception early 2000s have primarily focused on large-scale transitions in the transportation sector or regarding energy source dependency. Its domain has since expanded and transition researchers have also studied transitions in food and water supply, construction, city and waste management (Köhler et al. 2019). The healthcare sector has also been the subject for transitions and in the transition management context, but primarily in the Netherlands (Loorbach & Rotmans 2010; van den Bosch 2010; van Raak 2016). Therefore, it is relevant to discuss the applicability of transition dynamics and management in a different geographical context such as in Sweden.

Structure, practices and culture

Loorbach (2007) and van den Bosch (2010) explain that a transition is defined as a fundamental change in structures, practices and culture (Loorbach 2007; van den Bosch 2010). The aim towards providing healthcare outside the hospital walls in the Swedish healthcare system will inevitably as indicated by the interview subjects encompass all these three aspects (structure, practices and culture) and therefore it can be categorized as a transition. Perhaps the most distinct structural changes in Swedish healthcare are those concerning institutional and physical structures as van den Bosch (2010) would sub-categorize within structures. Interview subjects highlight updating institutional structures such as the educational system and legal frameworks, but also physical structures as support for digitalization and mobile care units. Practices are how actors conduct their work and behave (van den Bosch 2010). The projects, specifically 'Person-Centered Mobile X-Ray' have drastically changed practices regarding examinations and diagnostic information flow. However, according to the interview subjects the question remains if there is going to be structural support to sustain the newly changed practices after project finalization. Culture is the sum of shared images, norms and values that influence the way actors think and act (van den Bosch 2010). A conservative workforce or individuals reluctant to change have been a recurring theme in interviews and signifies the cultural journey the Swedish healthcare system must undertake in the transition. As briefly described above the Swedish healthcare transition affects structures, practices and culture which constitutes a transition (Loorbach 2007; van den Bosch 2010). Therefore, at least in theory transition dynamic and managerial tools may be useful to understand and influence the transition. Although, as Loorbach and Rotmans (2010) emphasizes, every transition is context specific and there is no standard recipe for managing a transition.

Transition dynamics concepts

In the section 2.2 two concepts to analyze transitions are introduced. The first is the multi-phase perspective which describes a transition in the performance of system indicators across a time period (Rotmans et al. 2000). Secondly, the MLP tool analyzes dynamic transition processes from three nested levels (Geels 2002; 2006). Rotmans et al. (2000) argues from the multi-phase perspective that transitions undergo several phases. The Swedish healthcare transition can be categorized as being in the *take-off* phase as the final reform of governmental Inquiry GQLH was submitted in 2020 and more concrete actions towards the transition have been taken around Sweden in 2021 and 2022 (Good quality, local healthcare 2020; Hellström 2021 Regeringen 2022). Systems and actors are mobilizing for change, but visible changes are rare (Rotmans et al 2000). Loorbach (2007) argues that a transition is a

continuous process for at least a generation (~25 years). Persistence for the transition as the Inquiry noted will likely be a point of contention where aggressive structural changes are made but perhaps there are few immediate positive results and poor communication from the leadership (Good quality, local healthcare 2020). The MLP tool as mentioned in section 2.2 provides a transitional perspective of how the healthcare system (meso-level) is affected by technological niches and landscape developments. Healthcare will inevitably be affected by technical innovation as detailed in Good quality, local healthcare (2018) as well as landscape developments such as aging demographics and more recently the COVID-19 pandemic. Geels (2019) argues that MLP can be used as an analytical tool to gather a 'big picture' perspective on multiple actors' dimensions which the healthcare system is in dire need of as the complexity of the system is hard to grasp. However, van Raak (2016) explains that the MLP is limited as a tool for prescriptive policy analysis, which implies that the MLP tool is more appropriate as a tool for describing the historical progress and current state of the healthcare system in relation to a transition.

7.2.2 Transition management principles

In section 2.4.1 transition management principles by Loorbach, Frantzeskaki and Huffenreuter (2015) was and Rotmans and Loorbach (2008) introduced. In table 7 below the principles are further applied in the context of the current healthcare transition in Sweden to elucidate the applicability of transition management in current context.

Table 7: Applied transition management principles

'Theoretical' transition management principles	**Proposed adaptation to the transition at large and collaboration arena**
Complex system analysis yields actionable and non-actionable insights for socio-technical system dynamics.	Utilize the Inquiry and adopt it to local conditions for Region Västra Götaland the city of Gothenburg.
Transitions in a socio-technical system takes around 25-50 years from pre-development until stabilization.	Good quality, local healthcare (2018) last follow-up is in 2027 although the transition is supposed to continue longer. The perspective should be at least 25 years, especially since the transition is in the take-off phase
Keeping options and objectives flexible.	Modern healthcare is a moveable target, anticipate developments and avoid technological, social, and institutional lock-in mechanisms
The timing of interventions is crucial.	Crisis events can yield significant entry points to move the transition in the desirable direction. For example, the Covid-19 pandemic increased the usage of digital meetings

Actors in the current socio-technical system should be given space for the creation of an alternative 'regime'.	The collaboration arena should be granted space from the healthcare system to innovate on future ways forward, the neutral leadership by Chalmers is advantageous
A transition cannot be steered or influenced by the means of transition management outside the existing socio-technical system.	When implementing experiments, use current structures, practices and cultures to learn and evolve the healthcare system in a desirable direction
As transition management is predicated on reflexivity, where social learning is essential.	Learning and dissemination of lessons throughout the whole healthcare system should be of priority
Not only does actors need to learn from other actors, but it is also necessary that there is a multi-actor network and participants from a wide range of actors is crucial for system innovation.	Incorporate the actors not just inside the healthcare system. For example, the regulatory system, school system, med-tech industry, higher education etc.
A socio-technical system consists of multiple levels (think MLP with macro, meso and micro).	The healthcare system is influenced by multiple levels from the operational level with interactions with patients up to the political decisions at the highest executive level. Steering the transition therefore requires strategies for all these levels.

7.2.3 Leadership in the arena

The transition arena as a theoretical concept usually exhibits many of the same complex characteristics of the overall transition. It is a complex, non-linear and unpredictable task of gathering actors from different domains and somehow creating a flourishing environment where they can successfully influence and enable a transition through a co-evolutionary interaction with the external environment (e.g the healthcare system). Facilitating and organizing a transition arena requires therefore a combination of process and substance skills (Loorbach 2007). Therefore, it is important to examine how leadership can take form within the collaboration arena.

Neutral leadership by Chalmers University of Technology

One core aspect of leadership is who should have it. Empirically, there is no definite answer for exactly who should initiate or lead a transition arena or a transition management programme. There have been both public and private sector initiators who have at least started a transition arena or a transition management programme (Loorbach & Rotmans 2010; Frantzeskaki, Loorbach & Meadowcroft 2012). In this healthcare context, it was Chalmers University of Technology, an academic institution who started the initiative 'Moving healthcare home' and formed the collaboration arena. So far (as of 2021), the fact that the initiative was started by an

academic institution and especially a more technologically focused institution is perceived to be a factor for success in terms of enthusiasm for the initiative and voluntary participation in the collaboration arena. As the collaboration arena consists mainly of main providers within the healthcare system (Sahlgrenska University Hospital, Närhälsan and the city of Gothenburg) Chalmers University of Technology is perceived to be a impartial and neutral facilitators which can negate political suspicion if the initiative was started by a main provider of healthcare. The importance of a neutral and impartial facilitator was reiterated throughout the interviews, and it was explicitly mentioned in the workshop. With Chalmers University of Technology in the leadership role, they have created what can be described as 'space' from the current healthcare system (Holmberg & Holmén 2021; Loorbach 2007; Loorbach & Rotmans 2010). Where the participants from the main providers of healthcare where they can feel minimally regulated by the overall healthcare system or the organizations within the system. This is clearly a strength in the initiative, and it should be leveraged as a negotiating tool further on as the collaboration arena starts to concretize activities and political tension may arise. Any power hierarchies should not be encouraged as a transition arena should be a relatively free and safe, protected environment which is aimed at stimulating the development of creative and innovative ideas.

The transition management team which facilitates the collaboration arena

Ideally a transition arena should be supported by a transition management team which consists of actors from the initiating organization, transition management experts, experts in the context of the transition and process facilitators. The transition management team supports the transition arena throughout the transition arena process with facilitating meetings and providing relevant information. Their roles in the first stages of the transition arena are explained in table 3. These roles will be elaborated on in the context of the collaboration arena. It is important to remember to stay away from blueprint thinking, there is no standard recipe for how to manage transition projects. These roles are not sufficient nor necessary for the success of a transition arena OR even the only possible roles but practical experience have shown that several elements of the transition management team have been successful in a practical setting (Loorbach 2007).

The initiating organization in the collaboration arena is Chalmers University of Technology which has already fulfilled tasks such as selecting participants and providing information for the arena which include drivers for transition (Hellström 2021). An important role according to Loorbach (2007) in the transition management team are the transition management experts which is currently not fulfilled. The role is related to transition studies and transition management as an academic field. The task as an expert in transition management is to structure the process within the context in which the transition arena takes place and employ the correct model/tool when necessary. The specific model or framework may vary and it is heavily context-specific. For example, the Loorbach (2007) cyclical multi-level framework transition management is used as a guiding influence in this thesis and a deployment of this model within the collaboration arena will require experts in transition management to successfully navigate a transition. The workshop conducted in accordance with this thesis was an example (albeit a modest example) of a task where transition management experts aimed to structure the discussions among the participants in the collaboration arena according to a theoretical framework by Holmberg and Holmén

(2021) in transition management. The collaboration arena would likely benefit from an expert in transition management to structure the process in accordance to best practices in the transition management literature. Considering multiple departments within Chalmers University of Technology are already associated with the collaboration arena, the Chalmers initiative for Innovation and Sustainability Transitions (CIIST) would be suitable for involvement within the arena (e.g., with a PhD student attached to the collaboration arena) (Chalmers 2021b). Research institutes and management consultancies could also be linked to the collaboration arena as examples have shown this to be fruitful (van den Bosch 2010). The role of experts in the context within the transition is reasonably fulfilled with the multiple departments of Chalmers University of Technology (CHI, Health Engineering and CVA). Their task would be to provide the collaboration arena with relevant information, data and knowledge about topics of discussion within the context of the healthcare transition. There could also be representatives from each main provider (Sahlgrenska University Hospital, Närhälsan and the city of Gothenburg) in this group of substance experts, but it is perhaps not desirable as it may interfere with the perceived neutrality of having Chalmers University of Technology as a facilitator. The last role according to Loorbach (2007) would be to deploy a process facilitator for meetings and workshops as a means for facilitating discussions and extracting as much out of each participant and meeting as possible. This role is currently not fulfilled and the facilitating team should be attentive in each upcoming meeting to identify if such a role needs to be fulfilled if meetings are sub-optimal.

The leadership should create a sense of urgency for participation

During the workshop one person specifically mentioned that participants in the collaboration arena should want to participate and prioritize the meetings. This particular issue of participant engagement and active leadership is not discussed to a significant degree in transition management literature. It is perhaps assumed that participants who do have the energy and time to participate in meetings, will therefore appear in the meetings. However, this should not be taken for granted as experienced during this thesis project. This issue was afterwards incorporated into the interview guide. From both the workshop and the subsequent interviews after the workshop leadership is deemed crucial in keeping participants engaged and creating a sense of urgency to prioritize the meetings. One rather superficial aspect of leadership and participant engagement is simply planning and scheduling in advance, so every participant has the ability to free up their schedule for every meeting. It may seem trivial, but several participants in the collaboration arena have brought up this specific point and given the strategic positions that the participants have within their respective organization, scheduling far in advance is important. Since the collaboration arena is built upon voluntary cooperation it is crucial that the meetings have a strong pulling factor so that the participants feel compelled to come to every meeting. As a group in the workshop explained, for long-term survival of the collaboration arena requires active leadership. The overall transition of moving healthcare home may be initially a strong pulling factor for many participants but without active leadership and progress the longevity of the collaboration arena is threatened. When the interview subjects were asked about how to create meetings which would be prioritized by each participant many suggestions were brought up. One particular strong suggestion that was mentioned by multiple participants was that all participants should collectively own and co-create the agenda. If Chalmers University of Technology as the facilitator sets the agenda too rigidly the participants

may become a passive rather than active. Loorbach (2007) emphasizes the importance of having a co-production process and the participants should themselves set the conditions in which the arena should operate. This should not be contradictory to an active leadership, as the primary focus of the leadership would be to facilitate and structure this co-producing process. In this aspect, transition management experts can structure the process with the use of frameworks or models but the substance should be collectively decided by the collaboration arena participants. This is tied together with the fact that many interview subjects wished to have clear goals and an agenda for each meeting to drive the transition forward and avoid time wasting. One interview subject wished to identify common problems and challenges in small groups within the collaboration arena; these groups would later be rotated so each perspective is heard from multiple backgrounds. The subject affirmed that the goal of these small groups would be to listen to other perspectives but more importantly collectively work together towards creating a common agenda without just hearing their background. To reiterate Loorbach (2007), the substance which is the goals and agenda should be decided by the collaboration arena participants but the facilitation and structuration of the process should fall under the supervision of the facilitating team of Chalmers University of Technology. Another suggestion which was mentioned by multiple interview subjects was to hand out assignments to participants before each meeting and perhaps be asked to present at the meeting so that now the participant takes an active role and is actually doing tasks. The exact details of the assignment are not particularly relevant but they should likely not be too big or too small and should be of mutual interest of every participant. This will likely create a strong sense of urgency to participate in the meetings but it is highly questionable if each participant has time and energy to devote additional working hours on the collaboration arena outside the meetings. It is however an appealing technique to explore its usefulness.

7.2.4 The composition of the arena

The transition management literature regarding the composition of a transition arena insists that the actors within the arena should represent the complexity of the socio-technical system in which the transition encompasses (Loorbach 2007; Loorbach & Rotmans 2010). There should be a mix of actors from the regime-level but also from the more innovative niche-level. The collaboration arena's proposed structure has at least three different levels which represent the level of engagement to the initiative. The core team within the collaboration arena consists of Chalmers University of Technology, Sahlgrenska University Hospital, Närhälsan and the city of Gothenburg. Legal experts were one actor that was specifically mentioned by an interview subject to the question if there were any actors missing in the core team within the collaboration arena. The subject area of regulations and laws was a recurring topic among the interview subjects and in the workshop as it was seen as an obstacle for the transition ahead. Therefore, it would be useful to include legal experts of HSL and SoL in the core team as they could bridge the divide on the felt regulatory division between regional and municipal healthcare.

Involve tech-friendly partners besides the core team

The core team is thus composed solely by actors from the regime-level in the public sector which deviates from the 'ideal' composition of a transition arena (Loorbach 2007; Loorbach & Rotmans 2010). However, the literature on transitions are often fixated on sustainable transitions in the energy or mobility sector (examples in

healthcare do exist but with a more narrow scope of a transition than in the initiative's 'Moving healthcare home' (van den Bosch 2010). Therefore, questions naturally arise. Should a transition arena within the healthcare sector be composed differently than in the energy or mobility sector? Should the core team within the collaboration arena include actors from the niche level such as medtech companies? The healthcare sector is less dominated by technical solutions than the other sectors. Interactions with the healthcare systems at any level (primary, secondary or tertiary care) are primarily based on human meetings. Even though this healthcare transition has overarching goals of automating and digitizing aspects of providing healthcare, it is deemed imperative to balance technological innovations according to individual patients' personal needs. In comparison, the energy and mobility sector are heavily reliant on technological ingenuity for a development in a transition. Historically, the mobility sector is filled examples of technical innovations that transitioned a whole sector (eg. sailing ships to steamships, horse-and-carriage to automobiles) (Geels 2006). The energy sector is currently trying to pursue technological solutions as one response to climate change (Grubb 2004). Niches are not exclusively related to technology but as noted, it is difficult to imagine that the healthcare transition will arrive in the form of a technological breakthrough. As interview subjects have noted, medical personnel in the healthcare system is heavily reliant on human interactions, which can of course be aided with technology. Therefore, industries within medtech could be included outside the core team in the collaboration arena, which is in the reference partners or additional stakeholders.

Involve private healthcare sector partners besides the core team

The core team in the collaboration arena consists of only actors from the public sector in healthcare. Only a few interview subjects thought that involving private sector healthcare providers should be involved in the core team of the collaboration arena, but perhaps in a later stage. Unsurprisingly, the resistance to the involvement of private actors is perceived to be dominated by the classical friction of private and public sector market incentives. Private sector healthcare providers are ultimately profit-driven, which rightfully makes their commitment to long-term healthcare transition ambiguous at best. Their motives and incentives would perhaps not be aligned to those healthcare providers in the public sector. Where the motivation is more centered towards providing accessible, equitable and good healthcare to every inhabitant in Sweden without ulterior financial profit motives. This friction should not be underestimated or downplayed, as politics in this area runs deep in the public's ideological perceptions of privatization in the healthcare system (Rågsjö et al 2021). However, the choice of not involving private sector healthcare providers in the core team of the collaboration arena may prove to be costly. A few subjects in interviews have explained that private actors are typically more efficient, quicker to respond in uncertainties (eg. COVID-19 pandemic) and are ahead in digitalization. One interview subject even went as far as believing that employees who still are left in the public sector are reluctant to change and are often taking on the role of 'playing the victim'. A shutout of private actors may lead to a loss in inspiration, creativity, innovations etc. Furthermore, 49 percent of all the visits in primary care happened at a private healthcare provider and 19 percent of the elderly lives in a privately owned nursing home in 2020 (Vårdföretagarna 2021). Inpatient care visits are almost exclusive to the public sector still. Evidently, a significant portion of the public interact with private healthcare providers, at some point it would probably be

inevitable to involve private actors, maybe not in the core team but as reference partners or additional stakeholders in the collaboration arena.

7.2.5 The people in the arena

In transition management literature the participants in a transition arena are defined as 'frontrunners', they are a small group (10-15 people) of actors from multiple domains within the socio-technical system (Loorbach 2007; Loorbach 2010; Frantzeskaki, Loorbach & Meadowcroft 2012). The participants in the collaboration arena exhibit multiple characteristics which are deemed essential for a 'frontrunner' in a transition arena. These are primarily process and substance capabilities, but there are also a few other aspects such as strategic authority and available time (Loorbach 2007).

People should be change-inclined

The first prerequisite for any frontrunner is to be psychologically inclined to change. Throughout the interviews with participants in the collaboration arena, it has been repeated numerous times that a consistent struggle has been to work with conservative and narrow-minded people. The emphasis is put on (nameless) individuals that impedes progress for change or collaboration. Even though structural barriers exist, for example a difference in practices and regulatory frameworks. At least a few interview subjects believe that these structural barriers can be bypassed with the cooperation of willing and able people. Per this background, the participants in the collaboration arena have been invited according to their proclivity for desire to change the Swedish healthcare system. This is arguably the best feature of the collaboration arena which is also supported by the transition arena literature of participant selection (Loorbach 2007). The search for appropriate change-inclined participants should be continuously revised as time progresses and more people are attached to the initiative. Social network analysis and the snowball method can be used for identifying important and relevant individuals (Bryman, Bell & Harley 2019; Scott 1991).

People should possess process capabilities

It is arguably not enough to just be psychologically inclined to change. Frontrunners should also possess process capabilities, which are described as strategic and tactical capabilities (Loorbach 2007). The traits are listed in table 2. The collaboration arena is currently (as of early 2022) in early state that the collaboration arena have only had a few informative meetings and the workshop conducted in relation to this thesis was the first time they exercised at task together. In the workshop, at least one group emphasized the point of having a "nice atmosphere and creativity in the room". This expressed ambition should not be taken lightly. Far too often promising group constellations are quickly derailed into meager disputes because internal politics and stubborn minds clash. Most of the interview subjects have never participated in a forum like the collaboration arena where multiple healthcare providers are gathered in the same room. There will inevitably be difficult discussions and situations where participants collide. Is the collaboration arena successfully able to harbor these discussions without derailing the overall atmosphere and creativity in the room, and also not deviating from the purpose of the arena? Can participants co-produce projects and knowledge together? Are participants open for new combinations and innovations instead of pushing their own solutions? Participants should be according to Loorbach (2007) selected, monitored and perhaps even deselected on the basis of their process

capabilities such as their skills in networking and communication in the collaboration arena.

People should possess substance capabilities

Adjacent to process capabilities are substance capabilities which concerns more cognitive capabilities than the more relational and personal capabilities in the process capabilities (Loorbach 2007). The collaboration arena has an expressed intent of influencing and enabling the societal transition in healthcare, which is a monumental task (regardless of what specific transition). Therefore, it is important that the participants have substance capabilities listed in table 2, which is essentially the ability to see complex problems at a high level of abstraction. To accomplish system innovation, participants should cultivate a 'system thinking'. Again, the participants have not previously been in a forum like the collaboration arena. Each participant who comes from a specific organization within the healthcare system should recognize their place within the overall system. For instance, to highlight this dilemma, a few interview subjects believed that Sahlgrenska University Hospital had an egocentric perspective on the healthcare system and often failed to recognize that municipal healthcare even existed. Participants should have the ability to look beyond the limits of their own domain and ultimately truly listen to another perspective (Loobach 2007; Holmberg & Holmen 2021). However, this should naturally be complemented with specific domain knowledge within their own organization. Participants should have extensive knowledge in their own organization of drivers, factors for success, obstacles, areas of opportunity etc, to successfully deploy and exploit them in the collaboration arena (Loorbach 2007).

People should have strategic authority within their own organization

Related to having specific knowledge in your own organization is also having strategic authority within the organization. In transition management, one important operational activity in the transition arena is using transition experiments. Experiments are often costly and time-consuming, and the existing structures should be used as much as possible for experiments with innovation potential (Loorbach 2007; Frantzeskaki, Loorbach & Meadowcroft 2012). The participants in the collaboration arena are exclusively from the regime in the healthcare system and therefore it is additionally important that the participants have a certain level of authority within their organization. The collaboration arena has expressed an intent of coordinating, complementing, and generating projects (whether these are transition experiments is discussed later) of mutual interest (Hellström 2021). A participant without a capability of initiating these within their own organization is undesirable for the participant selection. Interview subjects have also reiterated this point, saying that participants must essentially be leader/executive within their own organization, because otherwise nothing will ever get accomplished. Furthermore, participants should have the ability and a structure to establish and explain results from the collaboration arena. This is related to a point emphasized in the workshop, every participant should have an arena within their own organization because otherwise the knowledge is not going to leave the walls of the conference room and thus the participant serves no purpose. The exact structure of information dissemination to each respective organization will differ, nonetheless the topic should be raised.

People should be able to devote time and energy to the collaboration arena
Prior to participants having the process and substance capabilities, as well as enjoying strategic authority within their own organization. To have the time and energy to participate are important but perhaps neglected prerequisites to participation in the transition arena (Elzen, Geels & Green 2004). Influencing and enabling the societal transition in healthcare will require a substantial amount of time and energy from the participants. It is not sufficient that participants in the collaboration arena feel a strong devotion to the overall purpose and goals of the transition, they must be willing to invest the time and energy to play an active role in the collaboration arena's tasks and meetings. The minimum level of engagement is showing up to the meetings (whether they are physical or digital). The drop-out rate from the workshop meeting (which was the first physical meeting in the collaboration arena) arguably poses a credible threat to the collaboration arena's longevity and success. Some of the dropouts were due to sickness which is understandable. As the collaboration arena is based on voluntary participation, the participants who are at the meeting exhibit demonstrative power. Each meeting is legitimized by the participants. Participation sends a message; the transition is important and the means by influencing and enabling through the collaboration arena is important. Without active participation from many actors, co-producing knowledge together in the collaboration arena would be inadequate if important perspectives are missing. Besides being there physically or digitally. Active participation will require energy from the participants. The participants in the collaboration arena are often in strategic positions within their respective organization. Understandably, managerial positions regardless of domain typically have many time and energy-consuming tasks within their own organization. If the collaboration arena is fully committed to the expressed intent of coordinating, complementing, and generating projects, this will expectedly require energy from the participants. Participants should therefore be expected and ready to dedicate both time and energy to the collaboration arena. If the collaboration arena were sanctioned as more-or-less a job assignment for the participants within the respective organization, it would be easier for the participants to rationalize their involvement. However, so far, the collaboration arena is built upon voluntary participation, which does have its own benefits.

7.2.6 Financing the arena
Whether the collaboration arena should have a financial means is a contentious topic among the participants and according to Frantzeskaki, Loorbach, and Meadowcroft (2012) a transition arena should have financial means to innovate. The financial means could arguably be divided into two separate budgets intended for different purposes. The first one would be an administrative budget. One interview subject mentioned that funding would be needed to operate the arena, initial (small) projects and to communicate and spread results or discussions. An administrative budget is likely not to be contested by the participants and it could perhaps be financed by the facilitating organization which is Chalmers University of Technology. The other budget (and likely several magnitudes larger) would be towards the expressed intent of coordinating, complementing, and generating projects (Hellström 2021). Most of the interview subjects were opposed or at least skeptical at having a budget dedicated to projects. The one who was opposed expressed concerns regarding the controlling power money can have on a forum like the collaboration arena. They argued that with money involved bureaucratic rigidity and accountability quickly become influencing factors which can stifle the collaboration arena's relatively free

association with the healthcare system and voluntary participation. The more skeptical subjects are unsure about where the money would come from and how it would be equitably distributed if there are competing projects and interests. Both of these concerns are valid, and the interview subjects unanimously said that there were other ways to secure a budget for projects, like the Innovation Platform at Region Västra Götaland and Vinnova. These external sources for financial means are likely to be sufficient and productive towards the goal of the collaboration arena and they would likely remove some doubts or concerns the collaboration arena participants have about budgetary accountability. However, it should also be noted that when applying for financial means from external sources, it is only granted if the project fulfills the specific requirements from the respective organization. Section (section whaat) 2.3.4 contrasts the dissimilarities between a classical innovation project and a transition experiment. If the collaboration arena decides to initiate projects that are more aligned towards a transition experiment there may arise a conflict as requirements of a transition experiment and the requirements from granting organization for an innovation project may differ. For example, a transition experiment is typically geared towards being an open-ended learning process. In this experiment a concrete outcome may be slightly diffuse, and the overarching goal is to learn about the healthcare system's structure, practices and culture in order to get a better understanding of how the system fulfills a societal need and how to influence it according to transition goals. A granting organization of financial means may have stricter requirements of what the funds should be allocated on and therefore insufficient funds are dedicated to requirements in a transition experiment.

7.2.7 Activities in the arena and its role in the healthcare transition in the context of transition management

The transition management literature describes the transition arena as a governance arrangement aimed at influencing and guiding a transition towards a desirable direction through a multi-actor network with a co-producing approach to innovation and learning (Loorbach 2007). Broadly defined, the collaboration arena shares the same intent at least in its initial definition as a 'theoretical' transition arena and therefore this section explores some of the activities the collaboration arena can partake in if it would assume the role of a transition arena. Before describing the different activities, the role of the collaboration arena in the transition is not uniformly shared by all the interview subjects and it is important to recognize the diversity of opinions. During the interviews the question about the role of the collaboration arena and the subject's expectations of it was framed typically according to two examples of a collaboration arena. The first example of the collaboration arena was defined according to the initial expressed intent with guiding and enabling the transition with tools such as generated projects. In essence, the first collaboration arena was framed to take a more active role in the transition and this definition was closer to the theoretical concept of a transition arena. The second example of a collaboration arena framed to the interview subjects was designed to strip away some of the components an active collaboration arena would have and a more passive collaboration arena was described. The emphasis was on having a collaboration arena more as a networking forum for research and development projects. There is obviously overlap between the two examples, but the interview subjects still managed to place themselves along the continuum of desiring a either active or passive collaboration arena. This difference in opinions should be addressed by the facilitating team and the participants should themselves set the conditions for the collaboration arena process so the role and

expectations of the collaboration arena and its participants are explicit and clear, even if there is no structured blueprint on how to set up an arena with transformational aspirations (Loorbach 2007; Holmberg & Holmén 2021). Regardless if the collaboration arena assumes a more active role similar to a transition arena or passive role with a more networking approach, explicitly stated expectations and goals would likely yield a higher probability in the collaboration arena's longevity and lower turnover rate among participants. Thus, after the role is defined the collaboration arena can take next steps in influencing the transition. This thesis however is exploring how the collaboration arena can be designed in terms of a transition arena according to a transition management framework, specifically the cyclical multi-level framework spread by Loorbach (2007), which is illustrated in figure 4.

Cyclical framework: Strategic phase

The cyclical framework has multiple levels, and a transition arena has different responsibilities depending on each phase. As a reminder, the framework may appear straightforward and sequential, but in practice there are no clear fixed sequences, but the following phases will serve as preferred sequential steps (ignoring the often messy reality of facilitating people and projects). The first phase in the arena is the strategic. There are two objectives of this phase. First is to arrive at a shared problem definition and secondly is to develop a vision and shared guiding principles. For arriving at a shared problem definition, the transition management literature instructs that it should be based on an integrated system analysis (Loorbach 2007). For the system analysis the collaboration arena should use the governmental Inquiry (described in section 1.1.2) 'Good quality, local healthcare', many participants are already familiar with the Inquiry, but it is described in a national context, the Inquiry could be adapted in a regional (Region Västra Götaland) context by the participants. This could be accompanied with several discussions among the participants about their own perception of the problems, as one interview subject already mentioned it would be fruitful. Several of the interview subjects have not participated in a similar forum before and especially not with different main providers of healthcare at a strategic level. The goal would be to strip away preconceived egoistic notions about the problems and instead develop a shared language and a common set of problems. This step of the process can later be used later in thinking about possible solution strategies, agendas, and experiments. The second objective is to develop a vision and shared guiding principles. These items are also described in the Inquiry although again in quite broad and general terms which could be adapted by the collaboration arena in the local context. Furthermore, the vision development is an important step in the process of co-producing and working collectively as equal participants (Loorbach 2007). The goal is to develop a coherent overall image of a desired state of the future with an accompanying storyline on how this state could be achieved. The vision could also be divided into sub-themes to avoid a one-dimensional vision. For example, according to the areas within the healthcare system, digitalization, self-care, prehospital care, person-centered care, cooperation between the main providers, hospitals, primary care, municipal care and many more. Each one could have a vision attached to them. Practically, the visions should be based on the discussions from the previous objective, shared problem definitions. The primary goal is to come to an agreement on the desired future conditions and guiding principles. The visions and guiding principles can also be directed inwards as to how the collaboration arena should function in an ideal state with the expectations of the participants. The workshop tried to initiate the discussions about a common vision and inward

expectations of the collaboration arena and its participants. The result was a lively discussion about many aspects of overall transition images and the collaboration arena. The outcome can later be used to further concretize tasks that the collaboration arena should expand on, with more clear objectives. For example, in terms of purpose for the collaboration arena, it was mentioned that the arena should cooperate, spread information, unite about obstacles, create and share projects. Towards visions about the overall transition in healthcare, a few inspiring sentences were written down. For example, "not having to be a 'patient'", and the "possibility for individuals to be individuals and to own their life from the day they are born". The workshop was an introduction to this process of creating an overall 'image' of the transition and creating a shared language together with guiding principles. However, the process of developing a vision and thinking of a desired future might even be more important than the actual vision itself. With the gathering of multiple perspectives from main providers of healthcare who previously have not had this co-producing space before, the shared reflection about the current state and the desired future state will hopefully stimulate a new way of thinking about the problem (Loorbach 2007). A challenge will be to stay in this phase long enough. Promising initiatives can be derailed if initiative too quickly pushes for action and direct solution when the desired future state has not been fully explored (Holmberg & Holmén 2021).

Cyclical framework: Tactical phase

The second phase in the multi-level cyclical framework is the tactical. This phase has the overall objective at translating the long-term visions developed by the collaboration arena to medium and short-term goals. The tactical deployment is usually done using transition images and transition pathways which together form a transition agenda (Loorbach 2007). At the outset of this phase, the collaboration arena can form coalitions according to sub-themes within the visions. One interview subject discussed this aspect of the collaboration arena, where different themes and agendas could be tailored so the participants could engage in topics that were important to them. This division should not be done within the core team of the collaboration arena however since there are currently a relatively few individuals attached to the arena (around 15-20). Here, the reference partners and additional stakeholders can be utilized around these sub-themes of the overall transition vision. The overall collaboration arena can get quickly expanded to include more partners according to sub-themes. The figure 9 illustrates an example of how the collaboration arena is split into subgroups depending on the transition themes (note that this is only an example and it can be more).

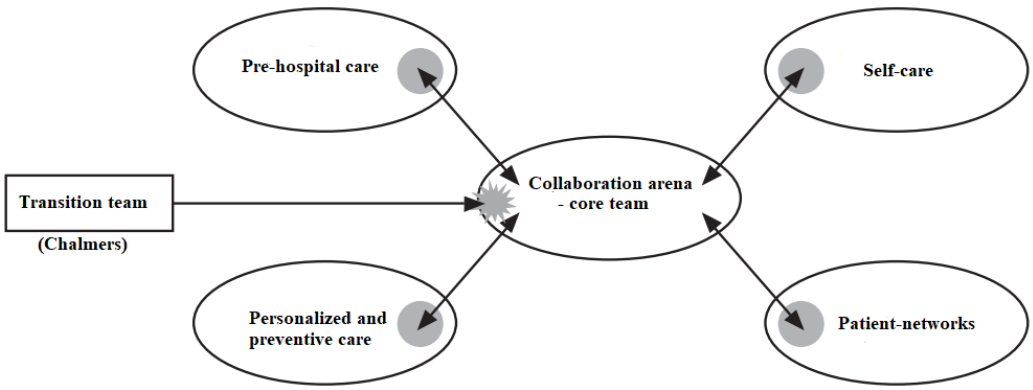

Figure 11: Example of the collaboration arena expanded into coalitions according to sub-themes

Each theme should include a description of the current (sub-)system, the sense of urgency of why this specific theme is important to develop and lastly the future state is described. It is important for the collaboration arena participants within the core team to fully internalize the overall transition vision and the subsequent sub-themes of the overall because they will have to communicate and mobilize actors within their own organization to push the theme into action. Each of these sub-themes can have a transition pathway associated with them (Loorbach 2007). A transition pathway can be developed in different ways using envisioning processes such as backcasting (Holmberg & Holmén 2021). The general objectives are to create a broader transition network, preferably with the reference partners and additional stakeholders so the collaboration arena can gather wider support in respectives organizations. Furthermore, the objective is also to make the transition more concrete and tangible by incorporating short-to-medium term goals and to indicate when and by whom changes should be made. The tactical phase is in general related to the 'process' dimension in the workshop. Here the participants got to think about desired development trajectories that require a strategy or at least factors for success to achieve it. A common theme shared by the workshop participants is the sharing of information, especially between projects to ensure that 'silos' (islands of excellence) are prevented. This aspect is visually represented in figure 9 as each sub-themes (or development projects within the sub-theme) are coordinated and collaborated by the collaboration arena.

Cyclical framework: Operational phase

The third phase in the multi-level cyclical framework is the operational. The overall objective here is to mobilize actors and to conduct transition experiments (Loorbach 2007). The collaboration arena should in this phase develop a transition experiments portfolio which is derived from the transition agenda (which includes transition images and pathways) from the previous tactical phase. In this portfolio it is important to collectively in the collaboration arena to develop selective criteria for the transition experiments to make them mutually coherent and to measure how they reinforce each other. By developing a system for selection, it will possibly reduce some of the aspects that projects have felt to be in 'silos' as mentioned in the above paragraph. Specifically, a few selection criterias are important in transition management according to van den Bosch (2010) which is the 'deepening' of knowledge about existing structures, practices and culture in the current healthcare system, 'broadening' the scope of the experiment by involving more actors in different contexts and 'scaling-up' the experiments and lessons learned to replace current structures, practices and culture. This is also the phase where the activities are the 'furthest' away from the core team in the collaboration arena where now the focus has shifted to short-term activities in transition experiments in niches. This will be a significant challenge here for the collaboration arena to convey the messaging and intent of the transition experiment resulting from previous phases (strategic and tactical) as now there are many actors involved that may have competing interests or different attitudes towards the transition. The concern of conservatism and reluctance to change was expressed by multiple interview subjects. In the formation of the collaboration arena they have bypassed reluctant actors but now as the transition experiments will be conducted it is plausible that the transition experiments will get

some resistance. This can perhaps be mitigated by persuasive leadership and formidable previous work in latter phases to wholeheartedly display and express the intent of the transition experiment and its role in the overall transition.

Cyclical framework: Reflexive phase

The fourth phase in the multi-level cyclical framework is the reflexive. The overall objective here is to monitor and evaluate the transition process (Loorbach 2007). This phase has not been emphasized in interviews or the workshop. However, it is important to recognize that the concept of modern healthcare is a moveable target, new medicinal development, organizational structures, and digital solutions makes the healthcare development uncertain and difficult to predict. The collaboration arena should systemize a process for external and internal monitoring to ensure that they are anticipating future developments when they arrive. A few interview subjects mentioned that external monitoring would be useful in an international context, but it could also include different regions in Sweden or even areas within Region Västra Götaland. Internal monitoring should be delegated to the transition team, to be tentative to the collaboration arena process in the different phases (strategic, tactical, and operational) in the transition.

7.3 How can the projects within the arena become transition experiments?

Two projects within the arena have been analyzed. These two are Person-Centered Mobile X-Ray and Autumn Leaves/ASAP. To further examine them, van den Bosch's (2010) mapping of transition experiment characteristics has been used according to table 8 below. The two projects have then gotten a score of sufficient, partially sufficient or insufficient depending on how well they incorporate the requirements written below. The scoring will be further elaborated in the section below, as well as a full analysis of the two projects in the perspective of transition experiments.

Table 8: Scoring of transition experiment characteristics

Characteristics of transition experiment	**Mobile X-ray**	**Autumn Leaves/Asap**
Starting point	+	+
Nature of the problem	+	+
Objective	+	+
Perspective	-	+/-
Method	+	+
Learning	+	+/-
Actors	+	+
Experiment context	+	+
Management context	-	-

+: Sufficient, +/-: Partially. -: Insufficient

7.3.1 Autumn Leaves/ASAP and project characteristics

ASAP has in general a sufficient score, covering most of the characteristics. It is important that the project stems from a societal challenge, with a complex-natured issue that does not have a clear or certain way of solving. Most innovation projects come about by wanting to fulfill a need or a place in a market, whereas a transition experiment is regarding a solution to a systematic problem, of a grander scale. As mentioned earlier, the third largest diagnostic group within Swedish healthcare is patients from fall accidents. As the system is transitioning towards a more home-based healthcare and self-monitoring, the project does not only stand in line with it, but it also tries to find solutions for a reoccurring societal challenge. As the largest group of patients are elderly, the problem becomes more complex as it then transcends between the different main providers of elderly care and hospital specialist care and ambulances. The project utilizes actors from other domains and industries, working together on the technical solution as well as on the customer base. How to solve the issue is uncertain, and the project has undergone revisions while testing their way forward, learning from past experiences. These are fully characteristics fitting with transition experiments. There are, nevertheless, three characteristics that are either partially covered or insufficient, namely the time perspective, the learning within the project and the management.

ASAP has a scope of 4-5 years, while not having it financed for the entirety of the planned timeline. During the project interview, the subject was planning for a medium-term project, though also pointing out that there were financial issues standing in the way for further schemes. There was an indication of a PhD student hopefully being able to bring the project to a practical point of testing in real life, but nothing concrete or certain as an end goal. For a transition experiment to be implemented, the scope must reach a long-time horizon, otherwise the project will end before it has been applied by the healthcare system as a whole. There is a risk then, by not having a financial plan or a practical implementation plan for the entire scope, that the project might be dropped or become a mere innovation project that does not see the light of day. In general, having a project being ruled by financing year by year is problematic as there is no way to plan further than to the next budgeting. Transition experiments are essentially practical experiments with a relatively high risk. They are meant to be tested on a small scale in practicality within the system they mean to affect. It all boils down to if the project will successfully arrive to the point of practicality or die without having any impact beyond the lab.

Though the project has undergone revisions through experience and learning, the focus of it is not in experiential learning activities. The subject mentioned occasional learning activities, giving feedback, and having demonstrations, but there are no set learning goals or planned activities. The subject also mentioned that the actors within the private sector were hesitant to share information regarding their testing and feedback. This suggests that all project members do not have full access to all information, as well as diminishing learning possibilities.

Lastly, the management was the only characteristic that was not sufficient. This grounds in that the management are not leading by transition management by no means. It is rather fitting with classic project management.

There were a couple of questions asked during the interview regarding the three transition management mechanisms of deepening, broadening and scaling-up. These were targeted at understanding how learning, transferability and scaling-up was planned in the project.

Deepening - Autumn Leaves/ASAP

Concerning deepening, which is the mechanism of learning, it was understood that there was no specific learning activity taking place. The project rather had sporadic learning opportunities by workshops, demonstrations and trusting the loop of testing and feedback. In a way, they have adapted the learning by doing relatively well. However, within the transition management sphere, learning is of great importance as it both brings the different actors together as well as pushes the project forward in a way that includes the best solution for as many as possible. This means that they are lacking doing-by-learning and learning-by-learning. The point of transition projects is to find new solutions to existing problems by fulfilling a need in a different way. It cannot be done without learning from the different actors and having an open dialogue on what is happening in the project, continuously. This would open for more possibilities of learning and detangling the complex nature of the problem, as well as not double work another actor's realizations. One actor might be sitting on with crucial information, but it is then inaccessible due to the lack of information sharing. Further, deepening does not only concern learning about the technical problems or learning from tech-actors, but it also includes deepening your knowledge both generically and context specific. It is important that all the actors in the project learn about the culture, structure and practices that are (hopefully) being changed with the project and the interrelations between these different practices and the experiment itself. Hence, there needs to be some concrete form of learning activities where the different actors partaking in the project, as well as the healthcare participants that are going to use the technology have conversations with focus on feedback and learning from each other. As this project is ongoing for many years, the flow of information between the members and the system they want to apply their technology will determine how well the project could be implemented in the system and how well their solution actually will work for a future transition. It is very important within transition management that the focus of the project not only lies in the technical attributes, but how it will work within the system they are trying to change. That means that they try to discuss and understand how it is going to work on a practical level, and how it is supposed to change the culture, practices, and structure of the current system. In this sense, more small practical tests and feedback needs to be done, and the discussion needs to include as many members as possible and the healthcare system for a clear understanding of what is needed and how change can be made. It could also be of interest to incorporate some type of expertise pool on learning and transition management that can follow and advise the group.

Broadening - Autumn Leaves/ASAP

Broadening concerns the transferability of the project. Not just within the VGR region and within ambulances, but other locations, organizations or even domains. In other words, it refers to the project being multi-functional and having probability of expanding to other contexts. That also opens the possibility of taking ideas and functions from other domains into the project, by making market analysis and researching similar solutions elsewhere. In this case, ASAP has been doing quite well, as the actors involved are from many varying backgrounds and industries. This

creates a platform where different knowledge can combine for a solution that not only paves new ways within healthcare, but possibly in other domains too. It is important that they continue keeping an open mind and selecting potential partners and projects from different contexts that perhaps can add a new perspective of the solution. The different actors and projects could then reinforce each other, and perhaps the outcome could be used somewhere else in the future.

Scaling-up - Autumn Leaves/ASAP
In ASAP's case, their project is possible to transfer to different parts of the healthcare system, as well as other regions if they plan for scaling. Scaling-up is the last mechanism, but it is also the mechanism that might be the most difficult for ASAP to fulfill. The project is living per financing year, which fundamentally makes it difficult to plan and make ideas for a possibility of scaling and implementation. The scaling up mechanism is meant to broaden the image of a possible new constellation of the existing system, where this project would be a part of the dominant way. In that case, it also needs an embedding and implementation plan, which halfly does not exist currently in ASAP, though they are hoping for it. During the interview, the subject did underline that it will be important to look at as the project proceeds, but currently there is no such plan making.

To summarize, there are several characteristics of transition experiments that ASAP does fulfill, being a broad experimental project, close to reality with a multi-domain actor base. The few enhancement possibilities are not too far off from where they currently are with the project, and perhaps a mindset in transition management or a perspective of it could help it to the next level.

7.3.2 Person-Centered Mobile X-Ray and project characteristics
The project 'Person-Centered Mobile X-Ray' has in general a sufficient score, covering most characteristics to be classified as a transition experiment. The starting point of the project is considered to be a societal challenge for the healthcare system in Sweden. One commendable aspect in the beginning of the project was the project leader's open-ended search process for testing and experimenting with the idea of diagnostic information flow from a patient's home to specialized care in the hospital. As it was in the beginning not constrained to x-ray diagnostics. This attitude is worth harnessing and promoting in future activities in searching projects that will influence the overall transition and especially when selecting for project leaders. The project leader in this project is not included in the core team of the collaboration arena but is very well familiar with the overall transition and with the intentions of the collaboration arena. The complex issue however is as the project leader emphasizes not on the technical aspects of the project, it is on the difficulty to gather the whole healthcare system in the same room and collectively work together. The challenge is to create value for the patient but also to create value for the main healthcare providers in the project. This aspect mimics the collaboration arena but on a more practical level with a patient in the center, whereas the collaboration arena is on a strategic level. Therefore, this project is an excellent example of trying to accomplish one of the more complex obstacles in the overall transition and receives sufficient scores in 'starting point', 'nature of the problem' and 'objective'.

The scope of this project is financially constrained. The project received further financial means to continue the project into 2022 and the project group was just

recently (as of early 2022) discussing how the project will survive in a long-time perspective but there are no concrete plans. Therefore, the project has an insufficient score in the 'perspective' characteristic, as this could be an area of improvement for a project to be classified as an transition experiment. The 'method', 'actors' and the 'experimental context' receive sufficient scores. The method of this project for determining a solution was not predetermined but rather they started off with a detailed description of the current state of how patients are being treated if they potentially suffer a hip fracture. Then all healthcare providers including the patient and relatives co-produced a desired future treatment with the new technology. Which is an open-ended process of searching and exploring but most importantly it is an co-producing process where all the healthcare providers and patients are heard and their perspectives are accounted for. This problem-solving method does also mimic the process in which the collaboration arena determines desired future states of the overall transition, which makes this project an excellent predecessor to provide experience and lessons for the collaboration arena. Furthermore, the project has as an explicit effort to involve all the actors in the healthcare sphere (at least the main healthcare providers in municipal and regional healthcare) which is similar to the collaboration arena. The experimental context takes place in real-life with actual nursing homes attached to the project and (unfortunately) elderly people who fall down and potentially fracture their hip. Which provides the opportunity to experience and not simulate how collaboration between the main providers of healthcare influences structures, practices and culture.

The learning characteristic in this project is sufficient, and it is well developed in this project with the initiative of having a dedicated 'learning room' as a separate structure to the project. The project leader was enthusiastic about the learning room and its importance for the project and even went as far as saying that he believed every project within Region Västa Götaland should include a dedicated learning room. This learning room is dedicated to achieving 2nd order learning where the actors question their practices and gather a mutual understanding of their role in the overall healthcare system and the care chain for this specific project. This learning aspect of the project could be institutionalized in transition experiments by the collaboration arena to make it an integrated part of every project. Lastly, this project does not take place within a 'transition management context' with an explicit transition vision and an associated transition agenda so therefore this characteristic is insufficient.

Deepening - Person-Centered Mobile X-Ray

Lastly, the potential for this project to serve as a contribution to the overall healthcare transition is analyzed through the mechanisms of deepening, broadening and scaling-up. The deepening mechanism was developed to a great extent in this project which had an explicit strategy to make learning as a top priority with the establishment of a 'learning room', which can be regarded as a parallel structure to the actual project. By doing so the project had allocated resources (time, money, and knowledge) for learning to be an open search- and learning process. The deepening mechanism defines that learning should be directed towards changes in structures, practices and cultures. The learning room has enabled the project group and actors within the project to learn about bridging the organizational gap between regional and municipal healthcare. The actors have therefore learned from each other about new perspectives through the learning room when they had to detail their role in the patient's journey in the care chain towards a diagnosis of a potential hip fracture. The project group

expects that the learning room should be a positive influence on reducing some reluctance to change from conservative colleagues. They argue that the reluctance typically stems from an ignorance of how the system works, which is precisely what the learning room aims to counter. One important lesson from the project has been that you seldom understand a system until you try to change it and throughout the project the actors in the learning room have also experienced a deeper knowledge about the system (or at least parts of the system). Furthermore, the project group argues as a project is often financially constrained the learning room will be a key factor in spreading knowledge about practices among the actors involved. For example, if there is a shortage of qualified staff to conduct x-ray examinations, the project will not be canceled as there are more actors who are familiar with the examination who could be aided with examination by qualified staff with video support. Eventually when the project will be evaluated, qualitative research will be primarily focused on the collaboration between the main healthcare providers and the patient at the operational level and not at the structural level between organizations. This could perhaps be a missed opportunity to extend the learning results about how to overcome structural barriers (e.g., financial, organizational, regulatory) which could provide valuable lessons for strategic actors (e.g., in the collaboration arena). To conclude, the learning room is likely a valuable tool for enhancing a project's potential to contribute to the overall transition. In this project, actors in the healthcare system have gained new perspectives on how to conduct a new practice and also a greater system knowledge. A point of contention is that it could be a more deliberate learning focus with explicit learning goals aimed at how the structural level is influenced during the project.

Broadening - Person-Centered Mobile X-Ray

Broadening concerns the transferability of the project, and it is primarily stimulated by having a 'context-independent' project which was the initial idea at the outset of this project. The mobile x-ray was not specifically targeted as the only choice of connecting diagnostic information flow from specialized medicine to patients in their home. The project in its structural form could be reproduced by another function who wishes to conduct medical examinations outside the hospitals (e.g., blood analysis, ultrasound). However, the project group has not had any explicit strategy from the beginning for introducing a similar experiment with another medical examination. Instead, these discussions have occurred organically when the project group has tried to understand the healthcare system and how the collaboration between the main providers of healthcare function. The project group claims that it takes a significant amount of time to understand the system and once sufficient knowledge is reached, ideas about how to find different application areas start to form. The challenge would however be to facilitate the interactions between the projects and to successfully deploy learning lessons gathered from the previous project (mobile x-ray) to ensure direction and a binding between the projects. Far too often, knowledge is stored in individuals and without any institutional capturing of the knowledge the valuable lessons and experiences may go lost and potentially the result will be just another 'island of excellence'. The transferability of the project also includes conducting the same medical examination at different locations or target groups. The project group is constantly trying to add more nursing homes that are attached to the project and there is also the intent of implementing the medical examination with a new target group as in the Prison and Probation Service. This could allow the project group to learn about the similarities and dis-similarities from contextual differences and each lesson should

be linked together to enhance the potential of the project to contribute to the overall transition. To conclude, the project will be well suited for transferability between functions, locations and target groups even though there was in the beginning a lack of explicit strategy for doing so. One particularly useful aspect is the focus on understanding the healthcare system and the collaboration between the main providers of healthcare, but the challenge will be to institutionalize the knowledge and connect potentially upcoming projects in either different function, locations, and target groups to ensure contribution towards the transition is made.

Scaling-up - Person-Centered Mobile X-Ray

Scaling-up is the mechanism of embedding the new structures, practices, and the culture of the project in the incumbent healthcare system. The topic of embedding the project in the healthcare system has been a recurring topic in the project group, and the topic is intertwined with the period in which the project has received financial funds for. Even though the topic has been raised and discussed, there is no explicit strategy for scaling-up and embedding the project yet. For the continuation and embedding the project group instead relies on creating a sense of urgency among the actors involved in the project so it would be unthinkable to cancel the project once the period for financial support ends. It is yet to be determined to see if this is a viable strategy. The collaboration arena could be a useful forum for ensuring the longevity of the project and embedding it in the healthcare system. If the project proves to be a success, the collaboration arena could offer protection for survival by having actors from the structural level who advocate for the project. These actors would both have the willingness and power to change existing structures and structurally secure the financing of the project. However, it is not only financing who is threatening the project's survival. It is still not clear who will be structurally responsible for the project once the project time is terminated. For example, who should be the responsible organization and distribute their resources accordingly? This sort of question is suitable for the collaboration arena as it is targeted at the structural level and involves all the main providers in healthcare. To conclude, the project is well suited for embedding in the incumbent healthcare system. However, there are multiple questions that remain unanswered, such as financing and structural integration beyond the project time. In these aspects the collaboration arena could offer support by having willing strategic actors who can investigate and conduct appropriate changes to affirm the project's contribution to the overall transition.

8. Conclusions

This chapter contains conclusions to the three research questions from chapter 1. Following are the closing arguments and findings of this research paper.

8.1 What are the main success factors and obstacles within Swedish healthcare in Region Västra Götaland?

Other than a couple of dissimilarities, the inquiry Good Quality Healthcare and the arena for Moving Healthcare Home had matching ideas of the success factors and obstacles for Swedish Healthcare.

Generally, the dominant obstacle was the lack of digitalization and dissemination of information. As time has gone by, the world around the healthcare system has changed, whilst the system itself has not transitioned as fast. Currently, there is a change in demographics, with an increasing older population, as well as a shortage of resources together with the challenge of recruiting and keeping competence within the system.

Many of the other obstacles revolved around politics and finance. The three main providers have created an invisible wall between the different actors, as well as making cooperation complicated with all the different rules, budgets, and regulations. Healthcare is complex as it is, as another obstacle mentioned is the fragmentation and decentralization of the system as a whole. The regions all have their own regulations, there are no national standards, and the short-lived political cycles pull the system in different directions each mandate period. Further, the healthcare in Sweden has been very focused on specialized care, leaving primary and prehospital care lackluster. The conservative workforce and lagging education will then also make the transition to a modern system difficult.

Putting the obstacles aside, the main factors for success were to increase digital tools, both for communication internally within the healthcare system, but also with their patients and actors outside of it. The flow of information would then also improve which could settle other obstacles within the system. There should be more forums for cooperation, both inter-organizationally and interprofessionally. The cooperation should also incorporate actors from all levels in the system, both bottom-up and top-down for the changes in practice and culture to genuinely happen. Further, there should also be more cooperation between regulations and legal frameworks for healthcare to keep improving its services and keeping the patient in the center.

Another topic revolved around keeping competence within the system, as recruiting has been difficult while having too few resources already. Other than sustaining competence, it would also be of importance to increase capabilities within leadership, specifically leading during times of complexity and change. This factor for success would be crucial, as the next factor would be to change focus from specialist care to prehospital care, preventive healthcare, and healthcare at home. The prehospital and preventive care would also need a purpose and concrete work descriptions. The arena suggested one leading style as leading with good examples, showing what is actually working in practice and how well it could be following the same patterns. And by

leading with good examples, the arena also suggested that it could be of interest to do external monitoring to see what other countries and systems have transitioned, what worked for them and if there is anything one can implement in the transition for Swedish healthcare.

8.2 How could transition management be applicable in Swedish healthcare, specifically within the initiative of 'Moving Healthcare Home'?

The purpose of this thesis was to use transition management as a theoretical framework for understanding the Swedish healthcare transition and shape the collaboration arena within the initiative 'Moving healthcare home'. Important aspects to consider in the arrangement of the collaboration arena are the leadership, composition, people, financing and especially its overall role in the transition towards a modern sustainable healthcare system in Region Västra Götaland.

The transition towards moving healthcare home in Sweden exhibits the several characterlike that is used to describe a transition, namely changes in structures, practices and culture. The healthcare system have technological and institutional barriers to change for the system to overcome, for example regulatory divide among main providers of healthcare and digitalization of information flow. These structural changes must support the subsequent changes in practices if healthcare is to be delivered outside the hospital walls. The projects have yielded promising results in changes of practices in a desirable direction of the transition. However, structural obstacles such as responsibility of the projects still threaten the longevity of these projects. Changes in practices ultimately changes peoples work and routines which will be met with some resistance. The healthcare system will undergo a culture journey that must be supported by a strong leadership and clear communication. Transition studies and management can give the decision makers in the Swedish healthcare transition important tools such as the multi-phase concept or the MLP to frame and analyze the transition. Furthermore, the transition management principles do seem highly applicable to this transition and should influence the collaboration arena, which is described more in the following sections from a design perspective.

Leadership
Chalmers is the initiating organization, and it is favorably viewed upon by the main providers in healthcare attached to the collaboration arena. Chalmers is considered to be a neutral actor without underlying competing interests with the other main providers of healthcare. This aspect is a strength for the facilitating Chalmers team and should be leveraged as political tensions rise. Active leadership that facilitates discussions and organizes meetings or workshops is essential to the longevity of the collaboration arena and requires two sets of skills. The first are process skills which is reliant on the leadership to drive the internal processes of the collaboration arena forward according to a process methodology (e.g., the cyclical framework in transition management). The second skill set is substance capability which relates to the healthcare transition and to supply the collaboration arena with relevant information and data to be the basis for discussions and workshops. Active leadership has an important task to create a sense of urgency to engage the participants in the collaboration arena for them to truly prioritize each meeting. This is likely vital for

the collaboration arena as it is built upon voluntary participation and soon the transition cause will not be enough to keep participants showing up to meetings. There are, however, a few suggestions to keep the participants engaged.

Composition of the arena
The composition of the arena should ideally reflect the complexity of the transition ahead to not miss out important perspectives or knowledge. The core team in the collaboration arena is however solely composed of actors from public sector healthcare and academia. This could arguably render the collaboration arena less successful in its pursuit for the objectives as it does not gather and consider perspectives from technological niches and private sector healthcare. Whether the core team should include actors from technological niches and private sector healthcare is difficult to answer due to healthcare in Sweden being deeply attached to the public sector. It is an important discussion to have and specifically about their role in the collaboration arena if they are not involved in the core team. A less controversial actor to include is legal experts in both HSL and SoL.

The people in the arena
The most important aspect of a collaboration arena is arguably the people attached to the arena. They are not important solely because of their position within their respective organization but also because of their determination to enable and guide the transition in healthcare. In addition, to be wanted for the role as a participant, they also need to have process and substance capabilities. Therefore, there are a few psychological and cognitive prerequisites for inclusion in the collaboration arena. Tied together with having extensive knowledge about your own organization is having a strategic position with the mandate to influence. Activities that may stem from the collaboration arena such as projects often use the existing structures of the healthcare system. A participant who is included in the collaboration arena without any authority in their own organization serves no purpose. There is, however, often a cost associated with having participants from strategic positions within their organization. A participant can be change-inclined, devoted to the cause of the transition, be a great communicator, an abstract thinker and have a managerial position, but do not simply have the time or energy to participate and be engaged in the meetings and workshops.

Financing the arena
Two budgets could be implicated to the collaboration arena. The first one would be an administrative budget that is needed to operate the arena in terms of administrative efforts such as booking conference rooms and even more extensive tasks such as communicating the results and discussions from the collaboration arena. The second budget would go towards one of the objectives in the collaboration arena which is coordinating, complementing, and generating projects. This budget would likely be several magnitudes larger than the administrative budget. The first administrative budget would likely not be contested by the collaboration arena participants but for the second budget a majority seem opposed to it.

Activities in the arena and its role in the healthcare transition in the context of transition management
This thesis uses Transition Management as a framework for shaping the collaboration arena, but it should be acknowledged that there are other frameworks for shaping a

governance arrangement like the collaboration arena. Regardless of what type of framework or governance arrangement the collaboration arena chooses to use, it should be mutually agreed upon by the collaboration arena participants. If the collaboration arena decides to take a more active role like a transition arena, the following phases in the multi-level cyclical framework in Transition Management is recommended to undergo. The multi-level cyclical framework can help the participants in the collaboration arena to decide which instruments to use and when but there is no strict hierarchical relationship between the phases. The phases can mutually influence each other and exist simultaneously. Furthermore, using the transition arena as a model for the collaboration arena is not a guarantee for success in a desired direction for the transition in healthcare, it is neither a necessary condition for a transition. If properly implemented, it could likely enhance the chances that the transition can be influenced in a desired direction. The first phase in the multi-level cyclical framework is the strategic phase which has two main objectives. The first objective is to create a common understanding of the problems or obstacles for the transition in healthcare. The second objective is derivative of the previous objective and should inform the co-production process of establishing a transition vision and shared guiding principles. The second phase in the multi-level cyclical framework is the strategic phase which has two main objectives which has the overall objective to concretize the long-term visions developed by the collaboration arena into short- and medium-term goals. For each sub-theme within the overall transition vision there should be a transition image and transition pathway associated with it. Collectively all the transition pathways and transition images for each sub-theme form a transition agenda. In the concretization of short- and medium-term goals more actors will be attached to the collaboration arena outside the core team. The third phase in the multi-level cyclical framework is the operational phase which has the overall objective to mobilize actors and to conduct transition experiments. These transition experiments are derived from the transition agenda from the previous phase and collectively they form an experiment portfolio. In the operational phase transition experiments are conducted in a real-life context with the use of existing structures on a day-to-day basis within the healthcare system. The fourth and last phase in the multi-level cyclical framework is the reflexive which has the overall objective here is to monitor and evaluate the transition process. Lastly, modern healthcare is a moving target. Monitoring international and national developments to find good examples of implementations of practices that could be implemented locally is therefore also a good option.

8.3 How can the projects within the arena become transition experiments?

Both the projects generally show a high potential in becoming transition experiments. They exhibit most of the transition experiment characteristics and have a degree of system innovation thinking and can use the arena platform for scaling, which means that there is a great possibility in becoming transition experiments. However, there are still a few tasks left undone.

The projects generally need to focus more on learning activities and feedback from all actors. The feedback also needs to be more continuous and in other forms than sporadic demonstration of technology. With that said, it also means that private actors

need to be willing to share all information with the project group, and the projects would benefit if there were more collaboration opportunities with healthcare professionals. After all, the projects are supposed to create change in the current structures. How can change be made if the main user and provider is left out, until the technology is done?

It is also of importance that testing starts in practice early, as the largest amount of work will be in testing the project, and changing the behaviors of providers, patients, and the health sector as a whole. In addition, there needs to be an implementation plan for how to scale the projects outside of the lab.

The largest issue is, however, the time aspect. The projects have yearly funding, making it difficult to plan far ahead, while also not knowing how much funding there will be. This, together with possible barriers in laws and regulations (spreading information, digitalization within healthcare etc.) will clash with the transition management mindset.

9. Recommendations

This chapter summarizes some concrete recommendations to the arena and its projects for future purposes. These recommendations are based on the discussions and the conclusions reached from the research.

9.1 The collaboration arena Moving Healthcare Home

- Leadership and facilitation should stay with the Chalmers team. Work diligently to stay neutral and leverage it as political tensions and competing interests may arise when activities take more of a concrete form.

- Experts in transition management and transition studies. Currently there are three departments or centers within Chalmers associated with the facilitating team (CHI, CVA and Health Engineering). Preferably, CIIST should also be attached to the transition team (e.g., with a PhD position).

- Substance experts in healthcare. This role is arguably fulfilled with the current Chalmers team (CHI, CVA and Health Engineering). However, with the addition of transition experts, the role of substance expert would be freed up to devote more time on their core capabilities within their subject field to provide information and data to the collaboration arena.

- Process facilitator. This role is dedicated purely to meeting and workshop facilitation. This role is currently also not fulfilled and would free up time and energy from transition and substance experts in the facilitating team to not worry about facilitating discussions.

- Planning and scheduling in advance. This may appear to be trivial and obvious, but many participants are in managerial positions where time is a scarce commodity. There could also be multiple meetings scheduled as a series to evoke a sense of regularity.

- Each meeting should have explicit goals and agenda for the participants to take part in. Agendas are typically common when sending invitations, but the addition of goals will hopefully create a sense of responsibility for the participants to use the time accordingly.

- The participants should collectively own and co-produce the agenda together with the Chalmers team. This is tied to the previous suggestion. If the participants themselves have created the agenda for each meeting they will hopefully sense a stronger urgency to partake in the next meeting as ownership of the agenda is now collectively shared, not just by the facilitating Chalmers team. The Chalmers team could however do post-meeting summarizations and from what was concluded develop the next upcoming agenda.

- Produce assignments in between meetings for the participants to complete and present to the next upcoming meeting. This suggestion is perhaps the ideal to keep participants engaged and prioritize the upcoming meeting. However, it is

questionable if the participants would find time during the normal working hours to work on assignments.

- The core team in the collaboration arena should have its current actors with the addition of legal experts who can detangle laws and regulations that separates regional and municipal healthcare.

- Initiate the discussion on how to include the private sector healthcare and actors from technological niches such as MedTech companies.

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- Change-inclined individuals. A common theme in the interviews is that people above all impede progress towards change. The participants are currently selected on the basis of their inclination of change, this should stay as a selection criterion (and continually revised) as more people are attached to the collaboration arena.

- Individuals with great networking and communication skills. Regardless of the activity in the collaboration arena, the participants will likely have to work close together and collectively arrive at solutions. Tensions will arise and individuals who can overcome them in a productive manner should be selected for in the collaboration arena.

- Individuals with the ability to do abstract and systems thinking. The healthcare system is incredibly complex and preferably the participants should have extensive knowledge about their own organization but also how their organization interacts with the rest of the system.

- Participants should have strategic authority within their own organization with the mandate to operationalize activities that the collaboration arena decides upon. The importance of participants having managerial positions was a recurring point made by multiple interview subjects and in the workshop.

- Participants should also have a structure to spread information from meetings and workshops. The collaboration arena would not achieve one of its main objectives if knowledge produced in the room stayed in the room.

- Participants should have the time and energy to participate in the collaboration arena. Unfortunately, the workshop suffered a great drop-out (some due to sickness), which was hopefully not indicative of disinterest in the collaboration arena and simply due to scheduling. Nonetheless, consistent participation is crucial for success and moreover active participation is required. Enabling and guiding a transition in healthcare is not easy and

neither should the collaboration arena be. Significant time and energy should be invested by the participants.

- Have an administrative budget for financing the collaboration arena's operative tasks. This could also include financing communicative efforts to spread the information from meetings or workshops and eventually results from projects. It should however be noted that if facilitating Chalmers team expands according to a transition team as earlier mentioned, the administrative budget would increase.

- A budget for projects should not be attached to the collaboration arena as multiple interview subjects have expressed a concern that a budget will introduce bureaucratic rigidity in the arena. There are however external sources like the Innovation Platform at Region Västra Götaland and Vinnova which will grant financial means to innovation projects.

- The participants should unanimously agree upon how the collaboration arena should function and the expectations of the participants. There was a significant divergence of opinion among the interview subjects when asked about the role of the collaboration arena in the healthcare transition. The collaboration arena could take a passive role with more networking and knowledge dissemination. The other role which is advocated for in this thesis is more compatible with the theoretical concept of a 'transition arena'. It would entail a significantly more active role with extensive collective work such as vision-building, agenda-creating, and project-generating.

- Arrive at a common understanding of the problems and develop a shared language among the collaboration participants. This is the first time many of the participants in the collaboration arena at the strategic level from each main provider in healthcare share a room together. As interview subjects have recommended, it would be fruitful if each participant could share their problems in greater detail. The government Inquiry 'Good quality, Local Healthcare' would likely also be of great aid, but problems need to be contextualized in Region Västra Götaland as the Inquiry is described on a national scale. A greater understanding of each other's problems will likely yield a strong sense of urgency to act and further develop as a group.

- Based on a collective understanding on the problem the transition in healthcare faces. The collaboration arena should co-produce an overall transition vision of how they envision a modern healthcare system. The workshop was a good start to this envisioning process and produced a few initial ideas of how the collaboration arena envisioned the future healthcare system. The visions can be further divided into sub-themes according to areas within healthcare.

- Develop shared guiding principles for the collaboration arena. The envisioning process should also be directed inwards towards the collaboration arena to create expectations of being an active participator and on how the collaboration arena should interact with the overall transition. The workshop

yielded good examples of shared guiding principles. For example, the meetings should have a nice atmosphere with creativity.

- Implement a process for translating long-term visions into short- and medium-term goals, for example a backcasting approach. This process will result in a transition pathway for how to arrive at that specific vision. This was briefly touched upon in the workshop and the discussion was primarily centered around projects. This discussion could be elevated to how projects can achieve goals in intermediate stages of the transition and especially how to achieve a coherent strategy for projects to ensure they do not become islands of excellence.

- Expand the collaboration arena beyond the core team to involve reference partners and additional stakeholders depending on the transition sub-themes. The collaboration arena has as an initial intent to involve other actors outside the core team when necessary, during the tactical phase it is appropriate to do so.

- Create an agenda for the overall transition which comprises transition pathway and transition images for each sub-theme. The healthcare transition is multi-dimensional, and the collaboration arena efforts should mimic the dimensionality.

- Establish an experiment portfolio depending on sub-themes with clear selection criteria. Preferably, the selection criteria should include the three mechanisms that could potentially contribute to the overall healthcare transition namely, ‘deepening’, ‘broadening’ and ‘scaling-up’.

- Communicate the transition vision with every actor involved in the experiment and let leadership reinforce the transition vision. This is likely crucial when mobilizing more actors along the organizational hierarchy. Multiple interview subjects have voiced their concern about conservative colleagues who are reluctant to change and the overall transition towards a more modern healthcare.

- Constantly monitor external surroundings regarding developments in healthcare. Modern healthcare is a moving target which will shift over time as developments and advancements in healthcare will inevitably arrive. The collaboration arena should anticipate that such developments will arrive in the future. A few interview subjects explicitly mentioned that external monitoring of international best practices would be useful, but it could also be extended to regional monitoring within Sweden or even in local context in Region Västra Götaland.

- Monitor and evaluate the transition process the collaboration arena engages for adjustments or additional elements that need to be included to an instrument.

- Continuously monitor the collaboration arena along the cyclical process

9.2 The projects within the arena

The recommendations in this section are based on theory of transition experiments and their mechanisms of deepening, broadening, and scaling up. Following are the recommendations for the projects:

Deepening - Learning as much as possible

- Have a pool of experts within transition management and social learning to deepen the learning activities.
- Create opportunities for continuous feedback, not letting private actors hide information.
- Trying to learn from healthcare provides what the project can mean for societal change, and what is needed in regard to their challenges.
- Institutional knowledge so important lessons and experiences towards the transition in the projects are not kept by individuals.
- Aim learning efforts at all organizational levels to ensure maximum knowledge is gained, specifically at the structural level.
- Investigate if and how the 'learning room' from Person-Centered Mobile X-ray should be used as a tool for more projects and its contribution to the transition.

Broadening - Increase the transferability

- Do a market analysis to regard other projects that can potentially be transferable, either in solution or method, to these projects. Those projects should not only be within healthcare, but other domains as well.
- Stimulate the multi-functionality of the projects. Is it possible to involve other domains in your experiment?
- Make sure the project is bound to the urgent societal need, and not to technological innovation. Look at trends, challenges, changes in environment and politics.
- Institutionalize knowledge so important lessons and experiences towards the transition in the projects are not kept by individuals.
- Stimulate the interaction and connection between projects that are conducted in different functions, locations, and target groups.

Scaling up - Scaling up and implementation

- Make sure that the continuity of the project is guaranteed, i.e., that implementation and practical testing is a part of the plan. This will be difficult because of funding problems, but it is essential that there is a concrete plan to this. Otherwise, the project might die as there is no action scheme.
- Try to find resistance points to the current regime. There will be clashes with current policies (e.g., sharing information, GDPR etc.), however, there might be a winning concept in thinking ahead of possible barriers and how to confront them.

References

Bergman, N., et al. (2008). *Modeling socio-technical transition patterns and pathways.* Journal of Artificial Societies and Social Simulation: an inter-disciplinary journal for the exploration and understanding of social processes by means of computer simulation. (11.3), pp. 1-32.

Brown, R. (1992). *Managing the "S" curves of innovation.* Journal of Business & Industrial Marketing.

Bryman, A. & Bell, E. (2011). *Business research methods.* Oxford University.

Bryman, A., Bell, E. & Harley, B. (2019). *Business research methods.* Oxford University

Center for Health Care Architecture (CVA) (2021). *About us.* URL: https://www.chalmers.se/en/centres/cva/about%20us/Pages/default.aspx [2021-11-30]

Centre for Health care Improvement (CHI) (2017). *About us.* URL: https://www.chalmers.se/en/centres/CHI/organisation/Pages/default.aspx [2021-11-30]

Chalmers (2021). *Chalmers Initiative for Innovation and Sustainability Transitions (CIIST).* https://www.chalmers.se/en/areas-of-advance/energy/joint_initiatives/pages/chalmers-initiative-in-innovation-and-sustainability-transitions.aspx [2021-12-17]

Clinical studies (2021). *The Swedish healthcare system.* URL: https://www.kliniskastudier.se/english/sweden-research-country/swedish-healthcare-system.html [2021-12-01]

De Dreu, C.K.W, & West, M.A. (2001). *Minority dissent and team innovation: The importance of participation in decision making.* Journal of applied Psychology (86.6), pp. 1191.

Dubois, A., & Gadde, L.E. (2002). *Systematic combining: An abductive approach to case research.* Journal of Business Research. 55(7), pp. 553–560.

Elzen, B., Geels, F.W. & Green, K. (2004). *System innovation and the transition to sustainability: theory, evidence, and policy*. Edward Elgar Publishing.

Frantzeskaki, N., Loorbach, D. & Meadowcroft, J. (2012). *Governing societal transitions to sustainability.* International Journal of Sustainable Development (15.1-2), pp. 19-36.

Geels, F.W. (2002). *Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study.* Research policy (31.8-9), pp. 1257-1274.

Geels, F.W. (2006). *Multi-level perspective on system innovation: relevance for industrial transformation. Understanding industrial transformation*. Springer, Dordrecht. pp. 163-186.

Geels, F.W. (2019). *Socio-technical transitions to sustainability: a review of criticisms and elaborations of the Multi-Level Perspective.* Current Opinion in Environmental Sustainability (39), pp. 187-201.

Good quality, local healthcare (2017). *Good Quality, local health care: a joint roadmap and vision.* (SOU 2017:53). Stockholm: Ministry of Health and Social Affairs.

Good quality, local healthcare (2018). *Good Quality, local health care: a primary care reform.* (SOU 2018:39). Stockholm: Ministry of Health and Social Affairs.

Good quality, local healthcare (2021). *Good quality, local healthcare: a reform for a sustainable health care system* (SOU 2020:19). Stockholm: Ministry of Health and Social Affairs.

Gothenburg Municipality (2021). *Hälsa och sjukvård.* URL: https://goteborg.se/wps/portal/start/halsa-och-sjukvard [2021-12-09]

Grubb, M. (2004). *Technology Innovation and Climate Change Policy: an overview of issues and options.* Keio Economic Studies , 41 (2) pp. 103-132.

Health Engineering (2021). *About us.* URL: https://www.chalmers.se/en/areas-of-advance/health/about/Pages/default.aspx [2021-11-30]

Health and Social Care Inspectorate (2019). *Daglig verksamhet (LSS).* URL: https://www.ivo.se/tillstand/sol-och-lss-tillstand/daglig-verksamhet/ [2021-12-09]

Hellström, A. (2021). *När vården flyttar hem* [internal material]. Gothenburg: Chalmers University of Technology.

Holmén, J. (2020). *Navigating Sustainability Transformations.* Chalmers University.

Holmberg, J. (2018). *John Holmberg - Riksdagen Agenda 2030.* URL: https://www.youtube.com/watch?v=qWO2EFX80rM [2021-11-18]

Holmberg, J. (2020). *Medskapande omställningsarbete - backcasting expeditions för Agenda 2030.* SKR.

Holmberg, J. & Holmén, J. (2021). *Backcasting expeditions and sustainability transitions: outlining a methodology for purposefully navigating systems innovation and change.* Chalmers.

Johansson, K. (2020). *Vårdgaranti.* URL: https://www.1177.se/sa-fungerar-varden/lagar-och-bestammelser/vardgaranti/ [2021-12-01]

Kunskapsguiden (2021). *Ansvarsfördelning för hälso- och sjukvården.* URL: https://kunskapsguiden.se/omraden-och-teman/god-och-nara-vard/kommunal-halso--och-sjukvard/ansvarsfordelning-for-halso-och-sjukvarden/ [2021-12-08]

Köhler, J., et al. (2019). *An agenda for sustainability transitions research: State of the art and future directions.* Environmental innovation and societal transitions. (31), pp. 1-32.

Loorbach, D. (2002). *Transition management: Governance for sustainability.*

Loorbach, D. (2007). *Transition management. New mode of governance for sustainable development.* Utrecht International Books.

Loorbach, D., Frantzeskaki, N., & Huffenreuter R. (2015). *Transition management: taking stock from governance experimentation.* Journal of Corporate Citizenship, (58), pp. 48-66.
Van Knippenberg, D., De Dreu, C.K.W. & Homan, A.C. (2004). *Work group diversity and group performance: an integrative model and research agenda.* Journal of applied psychology. (89.6), pp. 1008.

Loorbach, D. & Rotmans, J. (2006). *Managing transitions for sustainable development. Industrial transformation - disciplinary approaches towards transformation research.* Kluwer Academic Publishers

Loorbach, D. & Rotmans, J. (2008). *Transition management: reflexive governance of societal complexity through searching, learning and experimenting.*

Loorbach, D. & Rotmans, J. (2010). *The practice of transition management: Examples and lessons from four distinct cases.* Futures. (42.3). pp. 237-246.

Lundin, N. & Schwaag-Serger, S. (2018). *Agenda 2030 and a Transformative Innovation Policy*. TIPC working paper. Transformative Innovation Policy Consortium.

Malmstedt, M. (2021). *De flyttar hem vården.* URL: https://www.chalmers.se/sv/styrkeomraden/halsa-och-teknik/nyheter/Sidor/De-flyttar-hem-varden.aspx [2021-11-25]

Markard, J., Raven, R. & Truffer, B. (2012). *Sustainability transitions: An emerging field of research and its prospects.* Research policy. (41.6), pp. 955-967.

Ministry of Finance. (2019). *Stora behov i kommuner och regioner* [Press release, 12th June].

McMichael, T. Blashki, G. & Karoly, D.J. (2007). *Climate Change and primary health care.* Australian Family Physician. 36(12), pp. 986-989.

Mölndal Municipality (2021). *Personcentrerad Mobil Röntgen* [Illustration]. URL: https://www.molndal.se/download/18.6f7cafb81791c8f07cf22a0f/1620287201067/Illustration-mobil-rontgen.pdf

Närhälsan (2021). *Om Närhälsan.* URL: https://www.narhalsan.se/om-narhalsan/ [2021-12-09]

PICTA (2020a). *Automatic fall detection improves the fall injury process for older people.* URL: https://picta.lindholmen.se/en/news/automatic-fall-detection-improves-fall-injury-process-older-people [2021-12-14]
PICTA (2020b). *Digital cooperation in the Mobile X-Ray project.* URL: https://picta.lindholmen.se/en/news/digital-cooperation-mobile-x-ray-project [2021-12-10]

PICTA (2021). *Autumn Leaves - förbättrad falldetektion i nära vård.* URL: https://picta.lindholmen.se/node/76283 [2021-12-14]

Regeringen (2021). *God och nära vård.* URL: https://www.regeringen.se/regeringens-politik/god-och-nara-vard/ [2021-11-25]

Riconfigure (2021). *Quadruple Helix Collaborations.* URL: http://riconfigure.eu/quadruple-helix-collaborations/ [2021-12-08]

Rotmans, J., Kemp, R., Van Asselt, M., Geels, F.W., Verbong, G. & Molendijk, K. (2000). *Transities & transitiemanagement: De Casus van een emissiearme energievoorziening.* Maastricht, ICIS / MERIT.

Sahlgrenskaliv (2021). *Sverigeunik röntgenutrustning tar vården hem till sköra äldre.* URL: https://sahlgrenskaliv.se/sverigeunik-rontgenutrustning-tar-varden-hem-till-skora-aldre/ [2021-12-10]

Sahlgrenska University Hospital (2021). *About the hospital.* URL: https://www.sahlgrenska.se/en/about-the-hospital/ [2021-12-09]

Schot, J. & Geels, F.W. (2007). *Niches in evolutionary theories of technical change.* Journal of Evolutionary Economics. (17.5). pp. 605-622.

Scott, J. (1991). *Social Network Analysis: a handbook.* London, Thousand Oakes, New Delhi, SAGE Publications.

Shah, T. (2002). *In search of king Solomon's Mines.* John Murray.

SFS 2001:453. *The Social Services Act.* Stockholm: Ministry of Health and Social Affairs.

SFS 2017:30. *Health and Medical Services Act.* Stockholm: Ministry of Health and Social Affairs.

Swedish Agency for Health and Care Services Analysis (2016). *Samordnad vård och omsorg: En analys av samordningsutmaningar i ett fragmenterat vård- och omsorgssystem.* [Press release, January]

Swedish Association of Local Authorities and Regions (2021). *Fakta om kommuner och regioner.* URL: https://skr.se/skr/tjanster/kommunerochregioner/faktakommunerochregioner.1022.html [2021-12-01]

Swedish Agency for Health and Care Services Analysis (2019). *Åt samma håll: Nationella insatser för stärkt ledarskap i hälso- och sjukvården.* Stockholm. URL: https://www.vardanalys.se/wp-content/uploads/2019/04/Rapport-2019-3-%C3%85t-samma-h%C3%A5ll-1.pdf

Swedish Government Official Reports (SOU) (2021a). *Om oss som arbetade i utredningen.* URL: http://www.sou.gov.se/godochnaravard/om-oss-som-arbetar-i-utredningen/ [2021-11-25]

Swedish Government Official Reports (SOU) (2021b). *Samordnad utveckling för god och nära vård (S 2017:01).* URL: http://www.sou.gov.se/godochnaravard/ [2021-11-25]

Swedish Government Official Reports (SOU) (2021c). *Good quality, local health care: a joint roadmap and vision.* URL: http://www.sou.gov.se/godochnaravard/english-summary-of-the-inquirys-first-report-sou201753/ [2021-11-25]

United Nations (2015). *Transforming Our World: The 2030 Agenda For Sustainable Development.* United Nations. New York. https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf

van den Bosch, S. (2010). *Transition experiments: exploring societal changes towards sustainability*. Erasmus University Rotterdam.

van Raak, R. (2016). *Transition Policies; connecting system dynamics, governance and instruments in an application to Dutch Healthcare.* Erasmus University Rotterdam.

Vetenskap & Hälsa (2011). *Pilotstudie i Skåne om mobil röntgen nu utvärderad.* URL: https://www.vetenskaphalsa.se/pilotstudie-i-skane-om-mobil-rontgen-nu-utvarderad/ [2021-12-10]

Vinnova (2021). *Autumn Leaves - automatic fall detection and digitization optimize the fall injury process for elderly.* URL: https://www.vinnova.se/en/p/autumn-leaves---automatic-fall-detection-and-digitization-optimize-the-fall-injury-process-for-elderly/ [2021-12-14]

Vårdföretagarna (2021). *Privat Vårdfakta 2021.* Stockholm: Vårdföretagarna. URL: https://www.almega.se/app/uploads/sites/3/2021/09/vardfakta-2021.pdf

Västkom. (2021). *Färdplan - länsgemensam strategi för god och nära vård.* Västra Götaland: Vårdsamverkan.

Westin, J. (2021). *Lätt mobil röntgen tar vården till äldre*. URL: https://www.vardfokus.se/nyheter/latt-mobil-rontgen-tar-varden-hem-till-aldre/ [2021-12-10]

Appendices

A. Interview questions to participants in the arena (translated from Swedish to English)

General questions about the health care transition
Tell us about your occupation and responsibilities?

What is your interpretation of the initiative ‘Moving health care home’?

How do you envision a sustainable health care system here in Gothenburg within the context for ‘Moving health care home’?

What are the main factors for success and obstacles in Gothenburg for the transition in the health care system?

Do you have examples of concrete projects that are a good example of how you envision the future health care system?

How has the COVID-19 pandemic affected your organization in accordance with how you envision the future health care system?

Specific questions about the collaboration arena within the initiative ‘Moving health care home’

What is your purpose of being in the collaboration arena and what do you bring to the arena?

How do you see the collaboration arena’s role in shaping the transition in a desired direction?

What is your view on the current participants in the collaboration arena? Are there any actors or competences that are missing?

Do you have experiences from a similar collaboration arena? What experiences and lessons do you bring to this collaboration arena?

Should the collaboration arena be an integrated part of the health care system of loosely affiliated?

Should the collaboration arena have its own financial budget, or should all the financial means be requested externally?

How can the meetings in the collaboration arena be viewed as a prioritized meeting by the participants?

B. Interview questions to project supervisors (Person-Centered Mobile X-Ray and Autumn Leaves/ASAP) (translated from Swedish to English)

What is the project about?

How have you been working with the project?

How do you think this project can lead to changes in structures, culture and practices?

What is the time frame for the project?

Who are the actors in this project? Would you need some other actor to improve the project?

How are the practical experiments made? Are you trying this in reality/practicality?

Did you change anything in the project since the first experiments?

How do you work with feedback and learning in this project? Do you have any specific routines to give feedback?

What happens with the feedback that is given?

What is the focus on when giving feedback?

Do you take information from other domains and apply to the project? Can you transfer learnings from this project to other contexts?

How have you planned to scale this project up? How do you spread the information about this project? Do you have high-positioned people in this conversation?

What are the plans for the future of this project?

How could this project be used in the arena of Moving Healthcare Home?

C. Formulated answers to the expedition triangle done by the participants in the workshop

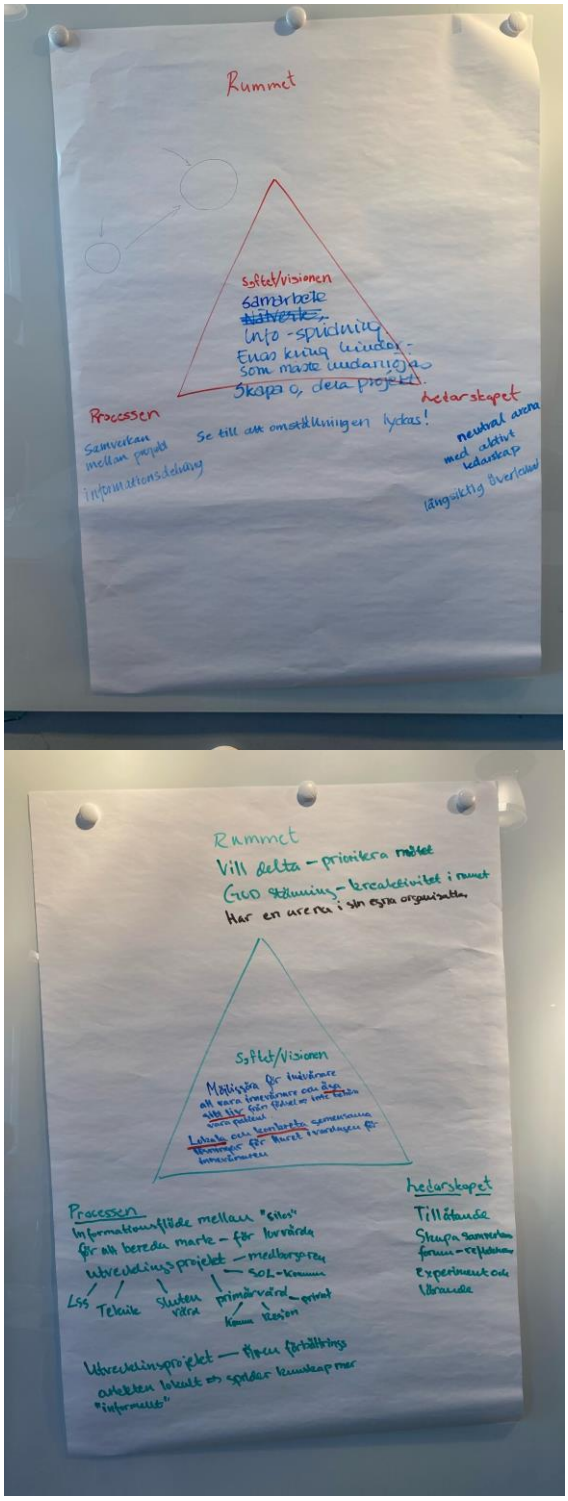

Figure 12: Pictures taken of each group's triangle

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