Manon Roest



TRANSFORMING HEALTH CARE TOGETHER

Behavioral aspects in inter-organizational networks

Transforming Healthcare Together
Behavioral aspects of inter-organizational networks

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Table of Contents

Chapter 1 General Introduction.....

Chapter 2 Organizing Telemonitoring – Decision-making Between Centralized and Distributed Models in the Netherlands, Using the Non-Adoption, Abandonment, Scale-up, Spread, and Sustainability (NASSS) Framework: a Case Study .....

Chapter 3 A Dynamic Model to Sustain the Spark: How Do Network Coordinators in Dutch Healthcare Networks Maintain Network Commitment?.....

Chapter 4 Brokerage Behavior in Healthcare Networks: A Qualitative Study on Knowledge Exchange and Innovation Dissemination .....

Chapter 5 "Care to Collab?" A Serious Game to Experience Brokerage Behavior in Healthcare Networks .....

Chapter 6 General Discussion .....

Summary.....

Nederlandse samenvatting.....

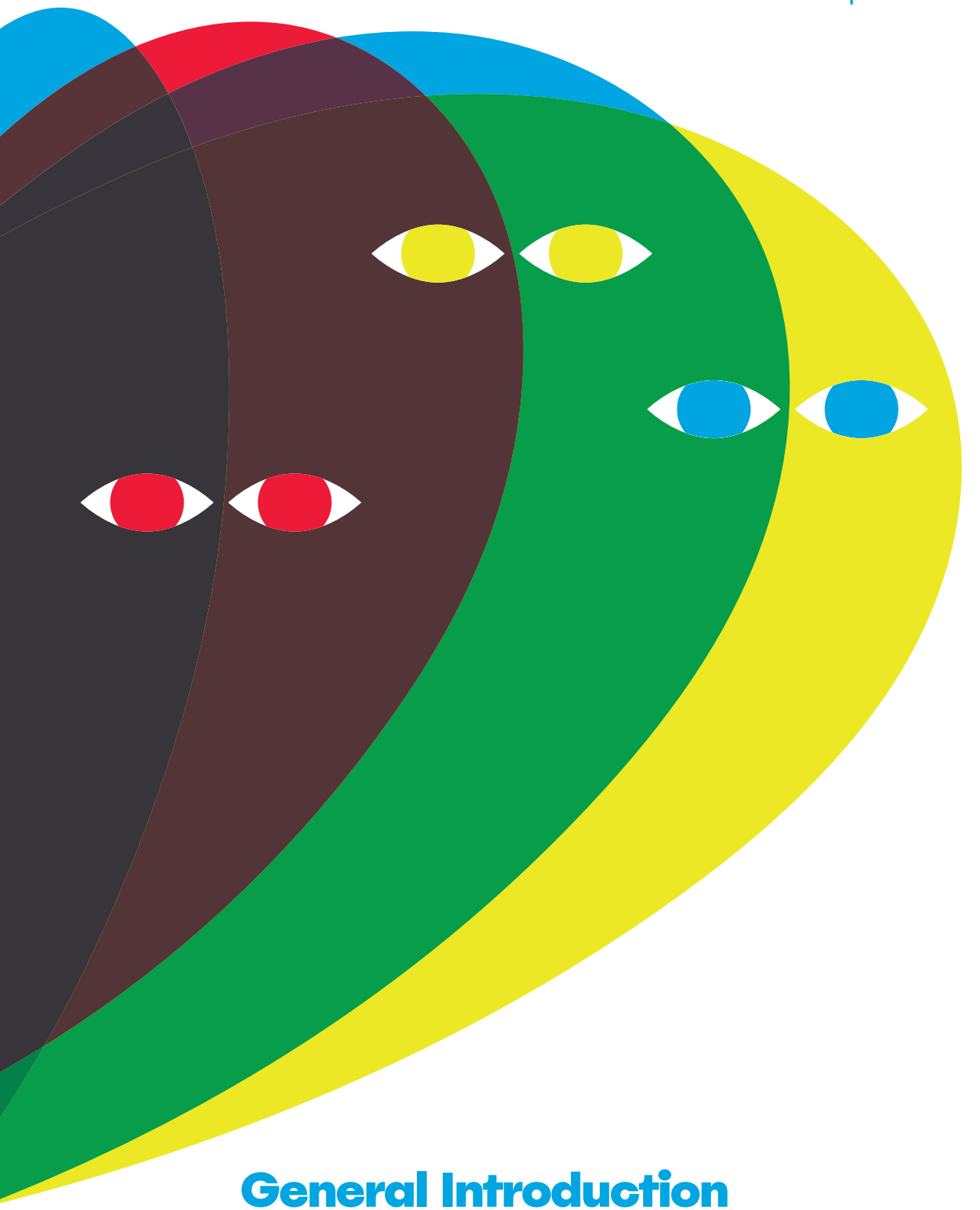
Appendices .....

Dankwoord.....

Output and impact .....

About the author.....

Chapter 1



General Introduction

Chapter 1 General introduction

Challenges for Health Care systems

Healthcare systems worldwide are confronted with multiple challenges that, collectively, drive the need for healthcare transformation, especially in Europe. First, demographic changes resulted and will result in a higher demand for healthcare services as population ageing accelerates. In the EU, projections estimate that by 2050, approximately 30% of its population will be aged 65 years or older, compared to roughly 21% in 2022(Pinkus & Ruer, 2025). Older adults are more likely to live with multiple chronic conditions, and thus chronic conditions have risen explosively, such as cardiovascular diseases, COPD, diabetes mellitus, and cancer, many of whom require continuous care(Boz & Kurnaz, 2025). Consequently, an ageing population is associated with a higher prevalence of multimorbidity(Belmonte et al., 2023). The combination of ageing and multimorbidity increases not only the demand for care, but also the complexity of care pathways in which multiple healthcare professionals and their organizations have to collaborate(Van Klaveren et al., 2025). Second, due to the rising demand for healthcare, expenditures increase every year, further intensifying pressure on already strained health systems(Boz & Kurnaz, 2025). Total healthcare spending depends on multiple factors such as national wealth, demographic trends including disease burden, introduction of new technologies and medicines, and the efficiency of the supply chain of health services (Polanco et al., 2025). As a result, many countries see their health spending taking a growing share of gross domestic product (GDP), which alone leads to concerns about the long-term viability of current healthcare systems(Boz & Kurnaz, 2025). Third, the demand for care is not aligned with the available workforce, and over the last ten years workforce shortages, especially nurses, represent a critical issue for the accessibility and continuity of care(WHO, 2025). Additionally, a high workload, and substantial administrative burden of healthcare personnel, lead to many healthcare personnel leaving their profession. Retention of workforces remain an issue in most countries(Armstrong, 2025; Hefner & Nembhard, 2021). Taken together, population ageing, rising multimorbidity, increasing costs, and workforce constraints form a complex set of challenges for healthcare systems. Although these challenges are well defined and substantiated with increasingly worrisome measure, the solutions for addressing them and for preventing further strain on health systems remain unclear. What is agreed upon is that sustaining the affordability, accessibility, and

equity of healthcare systems, requires fundamental change in the way healthcare is organized, delivered, and funded(Doebbeling & Flanagan, 2011). These fundamental extend beyond incremental improvement or efficiency gains and calls for healthcare transformation.

Healthcare transformation

Healthcare transformation is commonly described as a system-wide, multi-level change process that, through interventions, affects multiple organizations and care providers, aiming to improve efficiency, quality of healthcare delivery, and patient outcomes (Best et al., 2012). Literature on how to achieve this large-scale healthcare transformation remains limited as most initiatives fail to scale into system-wide transformation(Teo et al., 2023). Rather than conceptualizing healthcare transformation as an outcome that is either achieved or not through successful scaling, Charlesworth and colleagues(2016) argue that healthcare transformation should be understood as "a process of continual evolution, in which high-performing organizations generate learnings that can and should be spread across the system"(Charlesworth et al., 2016). Transformation is therefore not a discrete endpoint but a gradual process that unfolds over time. In this manuscript, healthcare transformation is defined as a process of redesigning care delivery, aiming to optimize the care quality and retaining equal access with a system-wide impact, thereby contributing to a more sustainable and affordable healthcare system. Building on the understanding that transformation is a gradual process, a recent literature review identified a set of enabling conditions for large-scale transformation, coined as healthcare 4.0(Sony et al., 2023). These include the integration of healthcare ecosystems across organizational boundaries; human-centered automation and digitalization; a strong focus on patient experience; strategic use of big data and advanced analytics; digitalized supply chains to enhance operational efficiency (beyond organizational boundaries); and deliberate implementation strategies to maximize realized benefits. In addition, transformation requires a supportive organizational culture that promotes collaboration, openness to technological adoption, and continuous improvement; a workforce equipped with the necessary digital and change-management competencies; and the development of innovative, sustainable business models. These conditions underscore the complexity of achieving healthcare transformation, as taken together, it encompasses multiple multi-layered dimensions, including organizational change, technology adoption, cultural shifts, behavioral change, learning processes, and financial restructuring. While this body of research has identified

several conditions that may facilitate healthcare transformation, it provides limited insight into how transformation processes unfold in practice and how these conditions translate into healthcare transformation.

Healthcare innovation

Healthcare transformation is typically realized through innovations. In response to the growing pressures of rising demand, rising cost and workforce shortages, healthcare organizations have therefore increased their efforts to innovate. Innovations are defined as "the source of any improvement in the quality of services and quality of life, but also a steady challenge to existing healthcare providers and systems"(Flessa & Huebner, 2021, p. 1). This definition emphasizes the impact of innovation rather than defining innovation solely in terms of specific products or processes, as innovations can take different forms. Traditionally, healthcare innovations have been categorized into product, process, marketing, and organizational innovations, as described in the Oslo Manual(Galindo-Rueda, 2013). More recent studies build on this classification but adapt them better to the sector's challenges. A recent systematic literature review distinguishes the following three categories of healthcare innovation(Mishra & Jain, 2025):

Consumer-focused innovations are directed to improve accessibility and patient experience. These innovations, amongst others, involve digital technologies, such as e-health solutions that provide healthcare services and personalized information at relatively low cost. For example, telemonitoring for heart failure care enhances patients' self-management while increasing care efficiency and reducing unnecessary hospitalization(Jansen et al., 2025).

Business model innovations focus on redesigning healthcare delivery to improve affordability and efficiency. In this context, e-health initiatives may also focus on business model innovations because they restructure care pathways, redefine value models, and alter cost structures. Other examples of business model innovations in healthcare include the deployment of physician assistants in primary care to expand access and reduce costs(Mishra & Jain, 2025).

Technological innovations encompass the introduction of new products, services, or process technologies that enhance clinical effectiveness, efficiency, and personalization of care. In this case, the digital platform that supports e-health initiatives and enables continuous data exchange between patients and providers is regarded as a technological innovation. Other examples are

artificial intelligence applications, such as AI-driven diagnostics that support clinical decision-making, reduce administrative burden, and may improve both quality and efficiency(Boone et al., 2024; Suman et al., 2025). Similarly, the adoption of robot-assisted surgery represents a technological innovation that enhances precisions and improves surgical outcomes(Burbano et al., 2025). Furthermore, continuous glucose monitoring devices, which enable real-time tracking of blood glucose levels for diabetes patients, enhancing self-management and reshaping the diabetic care pathway are technology driven innovations(Kwon & Moon, 2025).

Despite the distinction between three types of innovations, many real-live innovations encompass multiple types simultaneously. Nevertheless, this typology of innovations in healthcare illustrates the diversity of innovation efforts, focusing on patient empowerment, organizational redesign, and technological advancements, all needed for healthcare transformation. While innovations are widely recognized as a means through which healthcare can be transformed, understanding how these innovations can lead to system-wide transformation remains a persistent challenge.

Failing to scale innovations

Despite the evidence, from both research and practice, that healthcare innovation occurs daily at healthcare organizations, healthcare systems continue to struggle with persistent challenges related to workforce shortages, rising costs, fragmentation, and increasing demand(Polanco et al., 2025). An explanation as to why healthcare transformation has not yet materialized at a satisfactory scale lies in the predominantly local character of many innovations(Greenhalgh & Papoutsi, 2019). Innovations are usually developed within individual healthcare organizations or even departments, therefore tailored to specific contexts. While innovations demonstrate positive outcomes in one organizational context, it is not easy to transfer these to other contexts due to differences in contexts, such as organizational structures, cultures, resources, or even patient populations(Nilsen & Bernhardsson, 2019). When these innovations do not scale beyond their initiating organization, their broader impact on the healthcare systems remains constrained(Teo et al., 2023). Consequently, the mere presence of innovation does not automatically result in contributing to healthcare transformation. Without effective diffusion and dissemination across organizational boundaries, innovations remain local and isolated improvements rather than drivers for system-wide change(Greenhalgh & Papoutsi, 2019; Kwon et al., 2020). Diffusion and

dissemination of innovations is, therefore, particularly important but it is also challenging(Côté-Boileau et al., 2019; Novikov et al., 2024). Classic diffusion theory conceptualized this passive process as dependent on four elements: the characteristics of the innovation itself, the communication channels through which information is transmitted, the social system within which actors collaborate in achieving a common goal, and the time over which adoption unfolds(Rogers, 1987). More recent studies formulated similar categories, namely that diffusion and dissemination unfolds on different levels. At the interpersonal level within an organization, diffusion depends on scaling ambition, leadership, and entrepreneurial skills of people (i.e., healthcare professionals, management, policy advisors). At the organizational level, diffusion requires a strategic network (within the organization) with a collaborative structure that facilitates scaling. And at the network level (i.e., institutional environment level), there are rules, norms and configurations that influence how innovations can be scaled. At this level there should be a fitting supporting system for scaling innovations (Van Lunenburg et al., 2020). These insights indicate that the diffusion and dissemination of innovations are inherently multi-level processes. In healthcare settings, the diffusion and dissemination of innovations is frequently hindered by a combination or barriers, including professional and organizational boundaries, incompatibility between information systems, complex regulatory constraints, and variation in local contexts. As a result, effective innovations in one context are difficult to transfer to others(Lennox et al., 2022; Parmar et al., 2022; Strohm et al., 2020). For innovations to move beyond their original context and achieve broader system impact, these boundaries must be ‘bridged’. Such bridging efforts are executed by intermediaries (i.e. healthcare professionals, managers, policy advisors) who function as communication channels within and across organizations. These intermediaries can foster the dissemination of innovation by playing a central role in a social system(Abi Saad et al., 2024). This act of bridging boundaries by an intermediary can be understood as ‘knowledge brokering’. Knowledge brokering has been recognized by previous scholars as important for inter-organizational collaboration(Cross et al., 2023; Yamanie et al., 2023). Although knowledge brokering has received considerable attention, how such brokering unfolds in healthcare networks, what intermediaries do in healthcare networks, and how they contribute to scaling innovation for transformation objectives, remains underexplored.

Inter-organizational Healthcare Networks

Because healthcare transformation is a system-wide, multi-level change process, it cannot be achieved by individual organizations acting in isolation; rather, it requires inter-organizational collaboration to reach system-wide scale. This inter-organizational collaboration can be organized in a healthcare network(Mervyn et al., 2019; Van Der Woerd et al., 2024; Willis et al., 2012). Healthcare networks can be understood as inter-organizational collaborations in which multiple organizations work together to achieve not only their own goals, but also a collective goal for the network as a whole (Hearld & Westra, 2022; Provan & Kenis, 2008). To foster inter-organizational collaboration the Dutch Ministry of Health has introduced a program – the Integral Care Act (in *Dutch:* Integraal Zorgakkoord, IZA) – to stimulate transformation, especially focusing on regional redesign of care (Zorgakkoord, 2022). With this act, healthcare transformation is positioned as a shared responsibility of hospitals, primary care providers, mental health services, and social welfare organizations. The objectives are, enhancing patient care, reducing pressure on healthcare professionals, strengthening data sharing, and promoting quality of life by more emphasis on preventive healthcare(Kemper et al., 2025; Peeters et al., 2024). These developments suggest that healthcare networks are seen as infrastructures through which coordinated actions may be mobilized and dissemination occurs to achieve healthcare transformation. Although healthcare networks are often presented as an enabling infrastructure, limited insight exists into how these networks actually contribute to achieving transformation objectives. More specifically, it remains unclear how collaboration within and across organizations translates into system-level transformation.

Networks consist of ‘actors’ (i.e., nodes), such as organizations or professionals, who are connected through ‘ties’, meaning links or interactions(Borgatti & Foster, 2003). Networks can be analytically differentiated into three types, based on their goal and function(Peeters et al., 2023):

Structural-oriented networks refer to multiple actors that are connected through informal ties and ongoing interactions between them. These networks do not possess clearly defined boundaries, formal governance arrangements, or predefined goals(Nowell & Milward, 2022). They can be understood as social structures and are often studied through social network analysis with the aim of mapping the network in a visual display and thereby studying linkages between actors. One example is the mapping of consultations among hospital physicians, in which researchers

visualize 'who consults whom' about complex cases and to study consultation patterns(Chambers et al., 2012).

System-oriented networks consist of actors and their ties, in relation to a specific service or policy domain without having a shared identity or jointly formulated goals(Nowell & Milward, 2022). An example of this type of network is the constellation of organizations and professionals interacting around a mental health system. Although their collaboration is not necessarily formalized, and thereby some actors do not identify themselves as members of a clearly bound network, each actor is nonetheless connected to the network. These networks can be studied based on connectedness or system-level outcomes, such as accessibility, continuity, or quality of care(Manzi, 2023).

Purpose-oriented networks are often established with clearly defined boundaries, shared objectives and members who explicitly associate themselves with the network (Nowell & Milward, 2022; Nowell & Kenis, 2019). The participation of purpose oriented networks is based on a common goal that cannot be achieved independently, which is why they are also referred to as goal-directed networks(Carboni et al., 2019). Purpose-oriented networks can bring together diverse stakeholders across organizational and sectoral boundaries and often constitute multi-level forms. To coordinate activities and work towards shared objectives, some form of network governance is required. Network governance refers to the arrangements through which resources are allocated and actions are coordinated across the networks(Provan & Kenis, 2008). Networks typically adopt a particular governance arrangement to structure these interactions, and selecting an appropriate governance framework, referred to as governance mode, is considered an important condition for the effective functioning of inter-organizational networks. Accordingly, research on purpose oriented networks has examined governance modes, interpersonal connections (e.g., trust, leadership), and determinants of network effectiveness(Hearld & Westra, 2022; Peeters et al., 2023; van der Weert et al., 2022)).

System-level change inherently unfolds within broader system-oriented networks, within which purpose-oriented networks are embedded. Consequently, focusing on a single analytical perspective captures only part of the underlying complexity(Tietschert & Westra, 2024). Nevertheless, for analytical clarity, this dissertation focuses on networks that most closely align

with the definition of purpose-oriented networks, as they consist of at least three healthcare organizations that aim to achieve system-level healthcare transformation.

Using inter-organizational healthcare networks to achieve healthcare transformation

Although the Dutch healthcare system is regarded as one of the best healthcare systems in Europe in terms of quality and accessibility(Powerhouse, 2025), it is similarly strained by rising demand of care, workforce shortages, and worries about financial sustainability (Werner et al., 2024). Healthcare networks, are viewed by Dutch policy makers as promising vehicles for achieving system-level healthcare transformation, as transformation requires inter-organizational collaboration(Zorgakkoord, 2022). Beyond merely collaborating across boundaries, healthcare networks also foster conditions necessary for the objectives to healthcare transformation. They help to address complex issues that cannot be resolved by a single organization (Van Der Woerd et al., 2024) by providing a platform for spreading innovations(Greenhalgh & Papoutsi, 2019), supporting the diffusion of knowledge on best practices(Abi Saad et al., 2024; Williams et al., 2021), facilitating organizational learning(Van Vooren et al., 2024) and building quality improvement capacity at the system level(Knight et al., 2022). Although healthcare networks are hold the potential to drive healthcare transformation, they also face challenges that hinder sustained collaboration. For instance, the continuity of the network activities often depends on the availability of resources, such as financial support and dedicated personnel, which may not always be guaranteed (Auschra & Sydow, 2022). In addition, participating organizations may simultaneously collaborate and compete, which can generate tensions and hinder collective actions(Romiti et al., 2020). These challenges make sustaining network actors' commitment to the network particularly critical, yet also difficult as tensions and changing priorities also affect commitment to the network(Henry & Möllering, 2023; Pedersen et al., 2024). Given the potential and challenges of healthcare networks, literature has sought to understand if there are conditions under which healthcare networks function effectively. Previous research identifies several requirements, such as an appropriate governance structure, a feasible network size, sufficient resources, shared aims such as knowledge sharing or joint activities, and shared values building trust, and reciprocity(Aunger et al., 2022; Cremers et al., 2024; Peeters et al., 2023). Collectively, this research has provided valuable insights into the conditions under which healthcare networks are more likely to perform effectively. However, while previous work

identifies which conditions should be in place, it offers limited insight into *how* these conditions are realized, enacted and sustained in practice. Ultimately, networks are constituted by actors (i.e., healthcare professionals, managers) who interact within and across organizational boundaries, thereby shaping how networks functions and whether collective objectives are achieved(Cunningham et al., 2012; Long et al., 2013). Increasing attention has therefore been directed toward the behavioral aspects of inter-organizational networks. Studies have examined relational collaboration and collaborative processes within healthcare networks(Belrhiti et al., 2024), mechanisms through which networks are coordinated and tensions are managed(Saz-Carranza & Ospina, 2011), and the social actions and interactions that shape networks(Tasselli & Kilduff, 2021). Together, this body of work seeks to understand how actors in networks actually work together in practice. Nevertheless, despite this growing interest in the behavior of network actors, this perspective warrants deeper examination in the context of healthcare transformation(Mervyn et al., 2019; Thijssen et al., 2023). From a behavioral perspective, transformation efforts are not only shaped by the presence or aspects of an innovation, but by the mediating factors such as behavior that facilitates the change that unfolds(Kash et al., 2014). Studying these behavioral aspects provides a deeper understanding of how actors in inter-organizational healthcare networks collaborate toward and contribute to healthcare transformation, thereby informing how these actors can be more effectively supported in their collaborative efforts.

Aim of this dissertation

This dissertation, therefore, focuses on the behaviors of actors who collaborate in inter-organizational healthcare networks toward system-level healthcare transformation. Specifically, it seeks to understand how actors collaborate within healthcare networks explicitly oriented toward achieving healthcare transformation, and how these behaviors can be supported to facilitate transformation processes. The overarching research question is: *How do actors collaborate within healthcare networks aiming for healthcare transformation?*

This dissertation adopts a qualitative research approach. By examining empirical data on actors participating in healthcare networks, it aims to generate insights into how actors collaborate in healthcare networks, how such networks are sustained over time, and how they contribute to healthcare transformation, including through the dissemination of innovations.

Outline of the dissertation

This dissertation comprises six chapters that collectively advance understanding of how actors collaborate and interact within healthcare networks to contribute to healthcare transformation. **Chapter 2** adopts an organizational perspective and examines the considerations involved in organizing an innovation (i.e., telemonitoring) aiming to transform healthcare processes by shifting patient care from the hospital to the home environment. Two organizational models for the implementation of telemonitoring were analyzed using the NASSS framework(Greenhalgh et al., 2017) to capture the different domains and considerations involved. **Chapter 3** shifts the focus to the network level, examining sustained collaboration of actors over time. Given that long-term commitment is essential for achieving transformation objectives but difficult to achieve, this chapter delves into reasons why commitment wanes over time and how this can be managed in the context of a network. These managerial efforts ultimately lead to a dynamic framework for network commitment. **Chapter 4** explores the roles actors assume when disseminating innovations across healthcare networks. By identifying these roles and the enacted behaviors and aligned activities, this chapter provides configurations of brokers needed in healthcare networks aiming to transform. **Chapter 5** translates network theories into a practice-oriented serious game. In this chapter, the development process of the serious game is described, and it presents the initial experience of playing the game in practice. The serious game is designed to bridge the research-to-practice gap through experiential learning and reflective discussions. In **Chapter 6,** the main findings of this dissertation are synthesized, highlighting their interconnectedness. In this chapter, implications for both research and practice are discussed.

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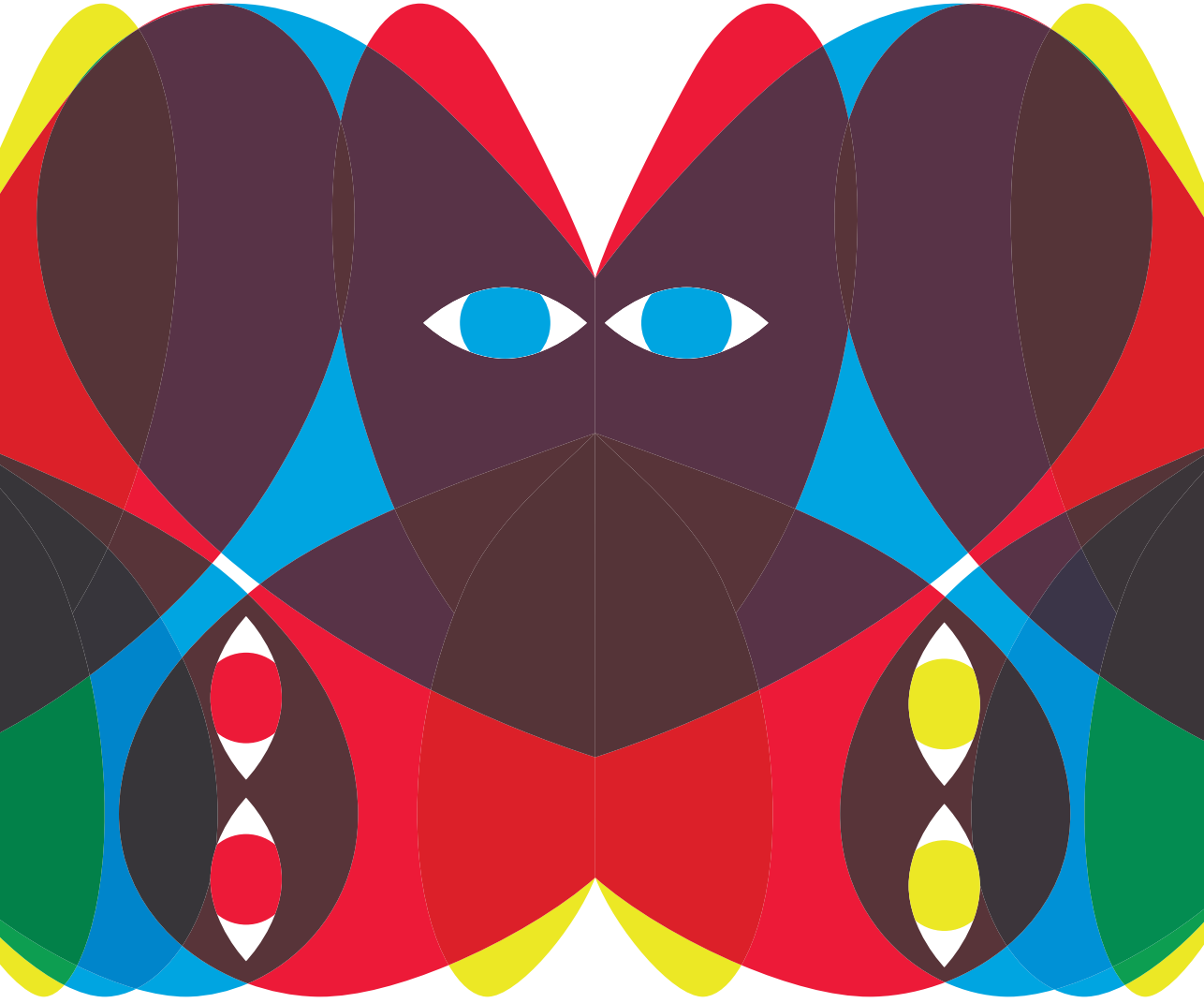
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Organizing Telemonitoring

Decision-making Between Centralized and Distributed Models in the Netherlands, Using the Non-Adoption, Abandonment, Scale-up, Spread, and Sustainability (NASSS) *Framework: a Case Study*

Chapter 2

Organizing Telemonitoring – Decision-making Between Centralized and Distributed Models in the Netherlands, Using the Non-Adoption, Abandonment, Scale-up, Spread, and Sustainability (NASSS) Framework: a Case Study

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Abstract

Background

Telemonitoring can be implemented using either centralized or distributed organizational models. However, few published studies explore which conditions make one model preferable over the other, or how to choose between these two.

Objective

This study aimed to investigate the decision-making factors across several domains (eg, technological, personal, and organizational) when selecting the telemonitoring model.

Methods

We conducted a multiple case study across 4 purposively sampled hospitals to gain a range of perspectives on organizational models for telemonitoring. Selection criteria included: (1) type of organizational model, (2) type of collaborating partners, (3) task division of handling notifications, and (4) it had to be implemented at scale, rather than being in an exploratory phase. Data was collected in a document study, 13 semistructured interviews, and a focus group. The topic list was based on the domains of the NASSS (non-adoption, abandonment, scale-up, spread, and sustainability) framework. Interviewees (n=13) were 5 project leaders, 2 tele-nurses, 4 health care professionals, and 2 clinical informaticians. Data analysis was performed iteratively and included reflective thematic analysis. A member-checking focus group was organized to verify and reflect on the findings.

Results

Various preferential factors based on the seven domains of the NASSS framework were explored for both centralized and distributed telemonitoring models: (1) Condition: the choice of objective, usually based on organizational strategy, determines whether telemonitoring will be centralized or distributed. (2) Technology: the preference for a model is determined by the anticipated number of notifications the application generates for a specific patient group. (3) Value proposition: the perceived cost-effectiveness and overall value to the patient shape the value proposition for each model. (4) Adopters: the new role of tele-nurse emerged in centralized monitoring centers (CMCs), necessitating new competencies, task redistribution, and shifts in responsibility. The importance of trust among staff became evident in the context of task redistribution. (5) Organization: CMCs are typically organized regionally, in partnerships or network arrangements, which can be time-consuming yet offer significant potential for impact. (6) Wider system: The existing Dutch reimbursement system does not incentivize CMCs because the payment structure is still based on a per-treatment model. (7) Adaptation over time: with advancements in technology, including artificial intelligence, organizing telemonitoring through CMCs is likely to gain popularity.

Conclusions

Our study highlights that when decision makers are choosing which telemonitoring model—centralized or distributed—to implement in their organization, deciding on the suitability of the model depends on multiple contextual factors. Our findings illustrate that decisions made for patient group selection, technology design, and value proposition significantly influence each other. It is therefore crucial for decision makers to understand these interactions and corresponding dynamics to better align their strategies with the operational realities of their organization.

Introduction

Telemonitoring outpatient and inpatient care (also coined remote patient monitoring, telehealth, and telemedicine) is a recognized solution to address healthcare challenges such as rising costs, staff shortages, and the need to improve cost-effectiveness, treatment quality, and reduce waiting times (Achelrod et al., 2017; Levine et al., 2020; Muigg et al., 2019; Scholte et al., 2023). Telemonitoring is defined as "the use of information technology to monitor patients at a distance"(Andrès et al., 2019, p. 204). Telemonitoring enables clinicians to maintain and adjust their patients' care plan by using remotely gathered data, such as vital signs, to proactively make medical decisions about a patient's care (Claggett et al., 2024). It involves the collection, transmission, evaluation, and communication of individual health data from patients to healthcare providers using technology. Because telemonitoring is widely touted to improve patient care while reducing staff workload and costs, governments worldwide stimulate it as a paramount innovation(Brunet et al., 2021; Huygens et al., 2021). While much research has focused on the positive outcomes of telemonitoring for patients and organizations(Farias et al., 2020; Leo et al., 2022; Taylor et al., 2021), less attention has been given to the organizational aspect of telemonitoring. Specifically, the considerations for various organizational models—centralized, distributed, or a combination of both (Dharmarajan & Chaudhry, 2016; Papoutsi et al., 2020). However, which model is preferable in a given context and how to choose between the models remains unclear.

In general, two organizational models are in place. First, a centralized organizational model, which places patient monitoring in a physical or virtual centralized monitoring center (CMC) and is primarily conducted by tele-nurses rather than physicians. CMC can involve monitoring patients across an entire healthcare organization, network, or even a region (Dharmarajan & Chaudhry, 2016; Shah & Kaltsakas, 2021). The literature reports notable advantages to a centralized organizational model, including improved efficiency and cost-effectiveness through economies of scale and pooled resources, which are especially beneficial in rural areas and alleviate staff shortages(Fairbrother et al., 2014; Thomas et al., 2023). The larger volume of cases in centralized telemonitoring permits 24/7 operation, instead of being confined to office hours in outpatient clinics(Brunet et al., 2021). Since 2019, structural financing for remote care (telehealth) was established in the Netherlands. Under specific conditions and for designated

diagnoses, hospitals became eligible to claim reimbursement for remote care through the existing Diagnosis Treatment Combination (DBC) system (Huygens et al., 2021). This reimbursement facilitated the digital transformation of healthcare, aiming for more efficiency in healthcare delivery. Studies have shown that patients are satisfied with centralized telemonitoring (Brunet et al., 2021; Fairbrother et al., 2012). Most professionals view centralized telemonitoring as favorable, although some are less acquainted with telemedicine, and harbor reservations (Brunet et al., 2021; Dyb et al., 2021). The second is a distributed organizational model in which professionals monitor their specific patient population(Papoutsi et al., 2020). Professionals believe they possess a better contextual understanding of their patients' data than tele-nurses who do not know a specific patient (Fairbrother et al., 2014). Some studies have shown that the doctor-patient relationship enhances patients' adherence to telemonitoring restrictions and therapy agreements. However, studies on the differences between centralized and distributed organizational models are lacking (Dharmarajan & Chaudhry, 2016; Fairbrother et al., 2014; Papoutsi et al., 2020)

Numerous studies, including several literature reviews, have explored the implementation of telemonitoring for patients with diseases such as hypertension, heart failure, diabetes, and chronic obstructive pulmonary disease (COPD) (Azevedo et al., 2021; Farias et al., 2020; Liljeroos & Arkkukangas, 2023). These studies highlight various organizational models and the challenges associated with the complexity of implementing telemonitoring (Heinsch et al., 2021). However, the challenges of organizing telemonitoring extend beyond adoption or implementation obstacles. They require a deeper exploration of different aspects, including context variables at the micro, meso and macro levels (Eze et al., 2020; Greenhalgh et al., 2017).

This is particularly relevant, as both centralized and distributed organizational models for telemonitoring can be implemented in a single organization or across multiple organizations, potentially spanning the entire care chain (Eze et al., 2020). To address this complexity, the NASSS (non-adoption, abandonment, scale-up, spread, and sustainability) framework provides a comprehensive lens, through which seven key domains are examined: condition, technology, value proposition, the adopter's perspective, organizational context, the wider context, and adaptation over time (Greenhalgh et al., 2018). Importantly, the framework does not imply a linear relationship between the domains but instead emphasizes their interconnectedness and

mutual influence (Tang et al., 2024). With this framework barriers and facilitators for implementation can be identified, and the complexity of each domain can be assessed (Abell et al., 2023; Gijsbers et al., 2023). Given this, our research question is as follows: which considerations are taken into account when choosing between centralized or distributed telemonitoring, following the NASSS framework?

Methods

Study Design

Using a qualitative research approach, we conducted a multiple case study to explore the factors hospitals consider when choosing between centralized and distributed telemonitoring models. The study complied with the Consolidated Criteria for Reporting Qualitative Research (COREQ, see Appendix 1)(Tong et al., 2007). The first author is a medical student in health sciences; the other authors are experienced researchers (PhD, associate professor and endowed professor). Ethical approval was secured from the Ethics Review Board of Tilburg University (Reference: TSB_RP741). Data storage is compliant with the General Data Protection Regulation (GDPR).

Setting

This study was executed in the Netherlands. This country has been implementing a series of policy measures aimed at facilitating the digital transformation of healthcare since 2012. Measures include the introduction of incentive grants, national guidelines, specific volume targets for hospitals and structural financing for remote care (telehealth encompassing telemonitoring) (Kroneman et al., 2016; Schiffelers et al., 2025; Zorgautoriteit, 2025). In the face of staff shortages, this has led to new forms of (hybrid) care, that aim to reduce the number of follow-up outpatient clinic visits for chronic patients, reduce hospital length of stay after surgery, etc. The Netherlands manages the health system through self-regulation among private entities: Health care services are provided by private providers and managed by private health insurers. Every individual in the Netherlands has the option to select their health care insurer and health care plan (Kroneman M, 2025). Since 2019, hospitals are eligible to claim reimbursement for remote care under specific conditions and for designated diagnoses, through the existing Diagnosis treatment combination (comparable to DRG) system, with costs covered under the statutory basic health insurance package. Hence, telemonitoring is covered by the Dutch health

insurance system (Huygens et al., 2021). In the Netherlands the availability of high-speed broadband internet and 4G mobile network are high and an estimated 90% of the Dutch people use this on a daily base. Still, healthcare organizations do not have the funds to upscale telemonitoring and therefore implementation progresses slowly.

Within this context, a purposive sample of teaching hospitals based on two organizational models (i.e. centralized monitoring and distributed monitoring) were selected. (See Appendix 2 and 3 for a visual representation of the centralized and distributed telemonitoring models). Hospitals employing telemonitoring were selected from a network of Dutch teaching hospitals (*Samenwerkende Topklinische Ziekenhuizen*). Given the relatively small number of hospitals in the Netherlands (69 non-profit hospital organizations), and the fact that only a few have implemented telemonitoring at scale, due to its relatively innovative nature, the selection of potential participants was constrained. To ensure comprehensive representation, all twelve early adopters of telemonitoring were put on a list. Project leaders responsible for telemonitoring in these hospitals were approached via email, which detailed the aim and design of this study. Four hospitals declined to participate (33%) citing as reasons: time constraints, or maternity leave. Of the hospitals willing to participate (N=8, 67%), we purposely sampled four that met the inclusion criteria outlined in Table 1, striving for a maximum variety of cases. An additional criterion was that the telemonitoring program had to be implemented at scale, rather than being in a pilot or exploratory phase.

We included two hospitals with primarily centralized telemonitoring (A and C) and two hospitals with predominantly distributed telemonitoring models (B and D). While B and D incorporated some centralized elements (10% and 9%, respectively, of their telemonitoring was conducted through a central unit) the vast majority (90%) were organized in a distributed manner across care providers. Additionally, in terms of collaborative partnerships, we included hospitals that operated independently without external collaboration (A), those that collaborated with general practitioners in organizing telemonitoring (B), and those that partnered with other hospitals (C and D). Finally, regarding role division in the monitoring process, we included hospitals where tele-nurses (A, B and C), nurse practitioners (B and D), and residents (D) were responsible for viewing telemonitoring alerts. This overview is shown in table 1. While the two distributed cases

(B and D) also implemented centralized elements, they were classified as predominantly distributed.

Table 1: An overview of the hospitals included on the basis of the selection criteria

Criterion	Hospital A	Hospital B	Hospital C	Hospital D
Organizational structure	Centralized	Predominantly distributed	Centralized	Predominantly distributed
Number of telemonitored patients	2,000	3,000 of which 300 (10%) centralized and 2,700 distributed	500	11,000 of which 1000 (9%) centralized and 10,000 distributed
Partnerships	None	GPs	Hospital network	Neighbor hospital
Role division of handling telemonitoring alerts	Tele-nurses	Tele-nurses (both nurses and nurse practitioners)	Tele-nurses (nurses with physical disabilities)	Tele-nurses (both nurses and nurse practitioners); residents during outside-of-office hours

Data collection

Data collection included a document study, 13 interviews conducted between March and May 2023 and a member-checking focus group held in May 2023. The researchers began by requesting implementation-related documents (e.g. implementation plans, current-state analyses, vision-related documents, or briefing materials for executive boards) from the project leaders of all four hospitals to study the organizational structures and challenges. Next, one researcher (NE) conducted 13 semi-structured interviews lasting between 30-60 minutes. The respondents were recruited via the project leader based upon criteria set by the researcher, including knowledge of telemonitoring and the respondent's involvement in the implementation process. Informed consent was obtained before the interview. The participants represented a diverse group

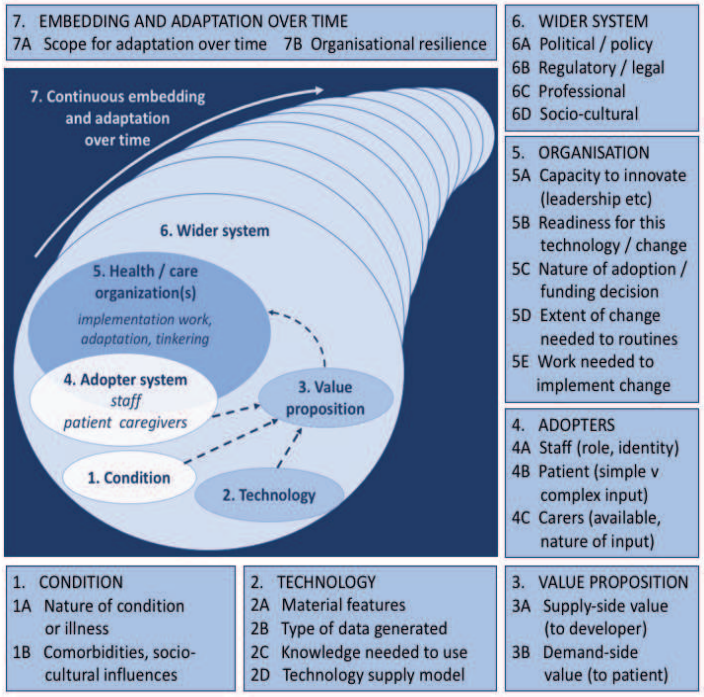
of healthcare professionals and the project leaders, including a clinical informatician, which ensured multiple perspectives. Their varied backgrounds allowed for comprehensive insights into technical, practical, and organizational aspects, thereby collectively addressing all domains of the NASSS framework.

Table 2: Interview participants (N=13)

Background	Sex (M: male, F: female)	Age (< 30 years, 30-39, 40-49, 50-59, ≥ 60)
Project leader	F (2) M (3)	1x <30 2x 30-39 1x 40-49 1x ≥ 60
Physicians	M (3)	2x 30-39 1x ≥ 60
Nurse practitioner	F (1)	40-49
Tele-nurse	F (2)	2x 40-49
Clinical informatician	F (2)	1x < 30 1x 40-49

Like previous studies that applied the NASSS framework to study telemonitoring (Dijkstra et al., 2019; Gijsbers et al., 2023; Hailu et al., 2024; Yakovchenko et al., 2021), we based our topic list (see Appendix 4) on this framework as well (Figure 1) (Greenhalgh et al., 2020; Greenhalgh et al., 2017). As the NASSS framework incorporates seven interrelated domains that influence the implementation of innovative technologies, we considered it helpful to gain an understanding of relevant considerations of centralized versus (predominantly) distributed monitoring. The seven NASSS domains are as follows: 1) condition or illness; 2) technology; 3) value proposition; 4) adopter system; 5) organization; 6) wider context; and 7) embedding and adaptation over time (Greenhalgh et al., 2017). Each domain can be defined by complexity (i.e. dynamics, unpredictability, and interdependency) and their influence on other domains

Figure 1: The NASSS framework (Greenhalgh et al., 2017)



The interviews were video recorded through Microsoft Teams and transcribed verbatim. Afterwards the transcripts were verified for accuracy by one researcher (NE). A one-hour focus group was subsequently conducted with the five project leaders to reflect upon our findings and enrich our insights by discussing the findings. This focus group was audio-recorded and transcribed verbatim. The participants mainly recognized and affirmed the results, thereby supporting the validity of our findings.

Data Analysis

The analysis was performed iteratively, ranging abductively between document analysis, transcripts (both interviews and focus group) and the literature (Bryant & Charmaz, 2019; Earl Rinehart, 2021). One researcher (NE) first open-coded the transcripts and documents via Atlas.ti 9. To ensure reliability, a second researcher blindly thematically coded three interviews to cross check coding. Afterwards, the whole research team discussed both codes up to consensus which resulted in a final code tree (see Appendix 5), which guided one researcher (NE) in the subsequent thematic coding(Braun & Clarke, 2023). Subsequently, selective coding categorized

the codes and connected these to the themes of the NASSS framework domains. Next, each domain got a code, and the data was analyzed by these codes to identify similarities and differences across the cases, which lead to an overview over complexities based on the criteria outlined in the NASSS framework. Finally, analysis and conclusions were discussed collectively (NE, MR, AW, MM). Overall, we applied in a reflective thematic analyses as described by Braun and Clarke ((Braun & Clarke, 2023), p. 2) "Reflexive TA [thematic analysis] approaches embrace researcher subjectivity as a resource for research (rejecting positivist notions of researcher bias (see Varpio et al (2021)), view the practice of TA as inherently subjective, emphasize researcher reflexivity, and reject the notion that coding can ever be accurate—as it is an inherently interpretative practice, and meaning is not fixed within data." Reflective thematic analysis was appropriate in this research, as we did not use the NASSS framework as a deterministic (i.e., implementation steps) or even predictive model, rather as a sentizing concept (conf. abductive research methodology) providing us a reflexive lens in our analysis to deepen our interpretation(Khurshid et al., 2026).

Results

This section presents the findings of this study, organized according to the seven domains of the NASSS framework. For each domain, we compared the considerations made between centralized and distributed monitoring models.

Domain 1: Selection Based on Patient Condition(s) and Telemonitoring Aims

The studied hospitals employed various telemonitoring strategies: 1) centralized in the CMC, and 2) a predominantly distributed model in which most monitoring occurred locally, though some centralized elements were also present (see Table 1). The CMC strategy focused on identifying conditions suitable for central telemonitoring and aimed to incorporate all eligible patients into the CMC model. In contrast, in the distributed model, with the majority being managed through a distributed model, patients were selected on the basis of the telemonitoring objectives and disease complexity.

Our analysis revealed two objectives: 1) To enhance patient self-management, which is especially relevant in chronic diseases. Self-management was achieved in an online process where telemonitoring resembles E-coaching, offering advice, and hospital staff intervened only if

advice was inadequate or if there were questions. Since most alerts do not require an immediate response, distributed telemonitoring is feasible because it can be performed alongside other tasks. Several respondents mentioned that distributed telemonitoring was feasible for low-complexity cases only, because of time limitations;. 2) To monitor vital parameters. If patient measurements deviate from preset ranges, alerts are generated, prompting notifications to staff. Most alerts require immediate attention, as the patient may need acute care. Therefore, centralized telemonitoring aligns better with this aim.

Domain 2: Technological features and number of notifications

In the Netherlands, two main vendors offer telemonitoring software applications to hospitals (Luscii and Sananet). All studied hospitals used both applications along with several additional applications to answer patient questions, often as part of their patient portal or an independent phone app. Consequently, healthcare staff used several applications. The visual and architectural design of these applications differed across hospitals. Our data reveals no relationship between the choice of software applications and the organizational model for telemonitoring.

Instead, our findings indicate that the intended telemonitoring objectives (i.e. Domain 1: self-management or vital parameter monitoring) and the work that needs to be done, especially the expected notification numbers, drive the selection of the organizational model. Vital parameter monitoring generates many alerts that demand a timely response. Alerts requiring urgent response impact heavily on the workload of the involved staff who must assess and filter alerts based on clinical relevance. Current software cannot distinguish between relevant and irrelevant alerts. The high volume of alerts cannot be managed alongside other tasks, necessitating either centralized monitoring or staff assigned to this function.

"The application captures most of the notifications or at least filters out the patients you don't have to see because they are in good health. The CMC eliminates another 80-90%. The nurses remove another 15% so that leaves the physician with zero to 5% patients to actually see." (Physician, hospital A)

In contrast, self-management provides less urgent alerts and according to respondents fewer alerts: *"Because the app encourages self-management, the number of alerts is very low […] We*

work in a team of three. I think about 1 FTE is assigned [to telemonitoring] for a population of more than 1,000 patients." (Project leader, hospital B)

In sum, the technology setup is not tied to the organizational model. However, the aims of telemonitoring affect the expected volume of alerts and anticipated staff workload, which in turn influence the choice of organizational model.

Domain 3: Influence of Efficiency and Knowledge on Value Propositions

Centralized and distributed telemonitoring offer distinct value propositions for both professionals and patients. The respondents indicated that in a centralized model, telemonitoring is assigned to dedicated tele-nurses in the CMC, allowing them to focus on telemonitoring tasks. Compared with a distributed model, their concentrated effort enables quicker response times compared to a distributed model (see Domain 2). Many respondents suggested that centralized telemonitoring operates more cost-effectively due to economy of scale. The benefits grow with more partnerships with other organizations or GPs (see Domain 5) and large numbers of patients are monitored. In contrast, respondents highlighted the cost-effectiveness of distributed telemonitoring models, as the telemonitoring tasks can be performed alongside other duties:

"[Nurses] in the outpatient clinic always have a spare moment between patients. They can answer a message. So, it is very energizing, and possible to do an 'in-betweenie'. So, the question is, how much capacity do you win if you centralize this?" (Project leader, hospital D)

Additionally, our respondents said that delegating tasks to (tele-)nurses in both distributed and centralized monitoring alleviates the workload of nurse practitioners (NPs) and physicians, giving them more time for complex patient cases. However, task delegation sometimes requires specialist knowledge, especially with urgent vital parameter monitoring (see Domain 1). Specialist knowledge of many diseases is hard to transfer to CMC nurses and NPs, making it crucial for staff in centralized telemonitoring organizational models to have direct access to doctors. Respondents indicated that transferring specialized knowledge and maintaining close communication with doctors is easier to organize in distributed telemonitoring. Consequently, distributed telemonitoring models provide patients with direct access to healthcare professionals who possess specialist disease knowledge and, in some cases specific knowledge about the patient. As one respondent said: "*This specific knowledge adds value for patients.*"

Thus, our data suggests that centralized telemonitoring is feasible for handling large patient and/or alert volumes (Domains 1 and 2), which require non-specialist knowledge, while distributed telemonitoring is preferable for alerts requiring specialist knowledge. Centralized telemonitoring is cost efficient due to economies of scale when managing many patients or high volumes of alerts, whereas distributed telemonitoring is more efficient as it requires no additional personnel.

Domain 4: Evolution of the Telemonitoring Adopter's Role

In both organizational models, monitoring staff required specific competences to incorporate the telemonitoring in their existing clinical workflows. Nurses took on a new role, expanded their responsibilities beyond those of traditional nursing. Consequently, the roles of NPs and physicians evolved, as now they supervise tele-nurses in their expanded responsibilities. In the cases we studied, the CMC tele-nurses were also responsible for developing telemonitoring clinical pathways for other medical conditions:

"I'm currently contacting physicians to determine which patient groups we can add to our monitoring program […] That's my primary task besides monitoring. We also write the workflow protocols when we start monitoring a new condition." (Tele-nurse, hospital A)

Respondents emphasized that this prominent role in organizing telemonitoring contributed to the growing enthusiasm for the tele-nurse role, which led to fewer personnel shortages in the CMC compared to other departments.

In addition, tele-nurses are taking on tasks that were previously performed by physicians and nurse practitioners. This shift in responsibilities requires a strong foundation of trust — particularly in the clinical judgment, decision-making and actions of tele-nurses. This is especially important when task distribution occurs across departmental boundaries, as is the case in centralized monitoring models. Central to establishing trust were collaboratively developed protocols, grounded in evidence-based medicine (EBM) guidelines. This joint development process ensured continuity by actively involving the original care providers (e.g. physicians and nurse practitioners) in shaping the clinical procedures. With this approach, confidence in the transfer of responsibilities was fostered and the transition of clinical tasks was supported. Additionally, our data indicated that trust was established through several approaches: 1) making

individualized care plans including patient-specific threshold for alerts, rather than relying on standard ranges for patients. This approach fostered the trust in clinical judgement of tele-nurses 2) developing new working routines, aligned with the task distribution. Clear communication about these new routines, particularly regarding responsibilities and alert management, helped building trust among professionals involved in the telemonitoring. 3) Project leaders fostered trust in centralized telemonitoring by facilitating disease-specific and training concerning the specific Electronic Medical Record to tele-nurses, enabling a competent transition of care. Responsibilities were transferred to the Coordinated Monitoring Center (CMC) gradually, beginning with administrative tasks and progressively expanding to the full spectrum of telemonitoring activities, allowing trust to develop through demonstrated capability. Furthermore, respondents mentioned that staffing the CMC with nurses from diverse specializations ensured access to specialist knowledge, thereby increasing confidence of colleagues in their ability to manage complex conditions and patients (Domain 2 and 3).

Thus, in both organizational models (tele-)nurses took on greater responsibility, under the supervision of NPs and physicians. Trust between professionals was crucial for this task redistribution, established through the development of evidence-based protocols, training, and clear guidelines, ensuring that (tele-)nurses could manage complex cases and alerts effectively.

Domain 5: Telemonitoring across Organizational Boundaries

Partnerships are a critical aspect of establishing CMC telemonitoring as efficiency depends on economy of scale. Collaborations can be either geographically bound/regional (hospitals B and D) or based on previously established (national) network structures (hospital C). In our study, partnerships were primarily formed in centralized telemonitoring programs, likely due to the more structured coordination and larger scale of these programs compared to the more fragmented distributed models. Consequently, the objective function as a regional CMC appeared to be connected to their initial partner strategy. In contrast, hospital C is piloting a network-based collaboration also aimed at expansion. This network partnership involves complementary task delegation as the participants strive to delegate tasks to and from other organizations. Respondents also noted the potential for complementarity of regional and network collaboration, as the following quote shows:

"In the case of a deviating measure [of a patient's vital signs], the CMC gets involved, prompting action. However, this action could potentially be delegated to a regional collaboration partner. The one does not rule out the other; they could work together very well." (Clinical informatician, hospital B)

Partnerships often allocate task delegation by (regional) partners to the CMC. However, respondents mentioned task delegation-related concerns about the freedom to comply or not with collaborative agreements and regional or network protocols. To address these concerns, hospitals B and D, having a majority of distributed telemonitoring cases, initially focused on regional initiatives, engaging all the partners (including GPs) in discussions on the challenges emerging from discrepancies between the protocols of the newly formed network and those of the established regional partnership.

To recap, partnerships are essential for CMCs to achieve efficiency through economy of scale. Collaborations can be regional or network-based, with CMCs benefiting from structured coordination, though task delegation between regional and network partners. However, this poses challenges related to protocol alignment and a need for making collaborative agreements.

Domain 6: Economic Context Impedes Using Telemonitoring to Solve Societal Challenges

Our respondents aimed to provide efficient care in the face of staff shortages and the need to meet the increasing demand for care due to more patients with co-morbidities and more elderly living at home. They feel telemonitoring can help address these challenges as it makes admitting patients or reoccurring outpatient clinic visits unnecessary. In the studied cases, one CMC employed nurses with physical limitations who were otherwise unable to provide direct patient care on the ward, demonstrating that telemonitoring allows these people to contribute to the workforce. By providing these new staff roles, telemonitoring, in both organizational models, supports workforce retention and efficiency.

In the Netherlands, both CMC and distributed telemonitoring are reimbursed under the same scheme. However, the current financing model within the Diagnosis treatment combination (similarities with DRG's systems) system is predicated on the substitution of physical care with remote care within the existing tariff structure. In practice, reimbursement rates for in-person care remain higher than those for remote services. Furthermore, hospitals are required to make

substantial upfront investments in digital infrastructure and personnel to support telemonitoring and remote care services. As a result, costs are incurred in advance of potential long-term benefits, and providers risk losing revenue from reduced volumes of billable physical consultations and hospital admissions. Given that hospital funding in the Netherlands is still partially based on production-related agreements—largely tied to physical service delivery—this shift towards more efficient, home-based care may inadvertently lead to a decline in institutional revenue, thereby creating a financial disincentive for scaling up telemonitoring:

"We have lots of telemonitoring and that costs us millions of euros [because we don't get fully reimbursed]. So, you're always thinking, what am I doing? I'm organizing my own downfall." (Project leader, hospital A)

Since there is no difference in reimbursement for centralized and distributed telemonitoring, these financial challenges are the same for all hospitals in this study.

Domain 7: Embedding and Adapting Telemonitoring Over Time

The CMCs in all hospitals are currently expanding, and many respondents anticipate an even broader role for telemonitoring in the future. Expected developments include more partnerships in CMC, extending the number of patient conditions monitored, and increased patient volumes.

"We're expanding to monitor more care pathways, and we're also aiming to increase the number of patients on each pathway." (Project leader 1, hospital C)

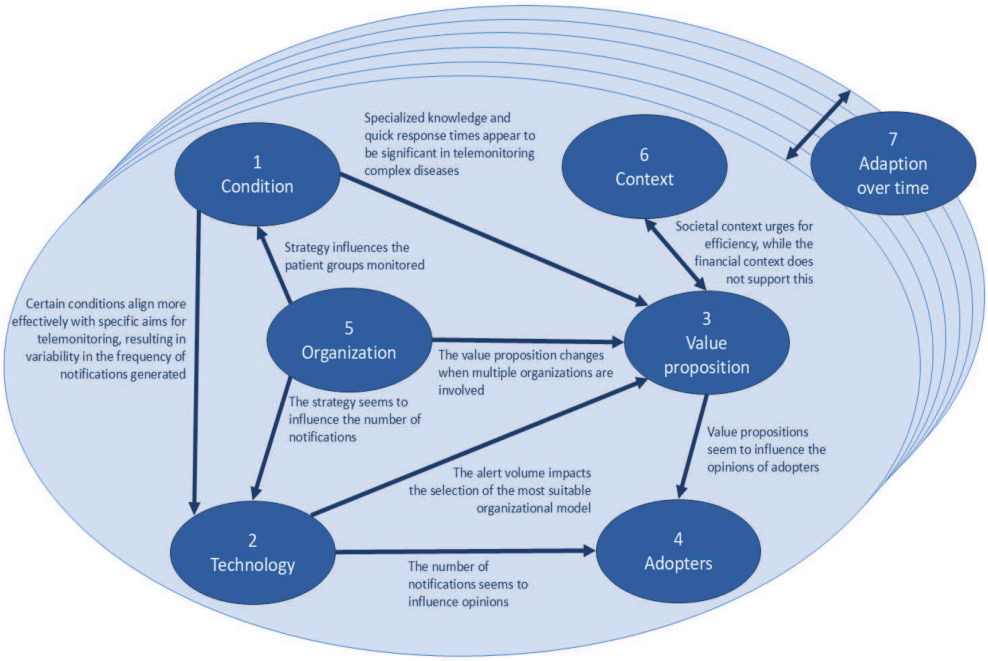
Some respondents suggest that advancements in ICT and artificial intelligence could facilitate this role expansion, especially in automating tasks such as distinguishing relevant from irrelevant notifications. This is particularly applicable to acute-care patients who require intensive monitoring. However, if automation leads to reduced numbers of notifications, it could also reduce the need for centralization.

NASSS Framework

Using the NASSS framework (Greenhalgh et al., 2017) enabled us to examine the domains while considering multiple decision-making factors. Figure 2 (below) illustrates the interdependencies found among the various domains. For instance, value proposition (Domain 3) is primarily based on the perception of cost-effectiveness and added value to the patient. It is also affected by the

selected patient group (Domain 1) and organizational strategy (Domain 5). The technology applied (Domain 2) affects how notifications are managed and handled, impacting the value proposition and opinion of adopters. When changes made in one area can affect other areas, interconnectedness underscores the complexity of decision-making in organizing telemonitoring.

Figure 2: Interactions between the domains of the NASSS framework (Greenhalgh et al., 2017)



Discussion

Principal findings

This multiple case study shows that the decision to implement telemonitoring, whether through centralized or distributed organizational models, involves a complex array of considerations that must be carefully weighed. A definitive argument in favor of either model cannot be made, as each option presents distinct advantages and challenges across different domains. However, our findings highlight that strategic decisions made early in the implementation process—particularly those related to the telemonitoring of objectives on the basis of patient groups—are crucial in determining the appropriate organizational model. These decisions, in turn, shape

possibilities related to personnel (e.g., hiring tele-nurses or educating outpatient clinic or ward staff, and the role physicians play), partnerships and the overall cost-effectiveness of telemonitoring.

Comparison with prior work

To date, many telemonitoring studies have focused on the design and development of the technology or the implementation of a specific telemonitoring care pathway (Farias et al., 2020; Leo et al., 2022; Taylor et al., 2021; Thomas et al., 2021). To our knowledge ours is the first study to systematically compare considerations related to centralized and distributed telemonitoring models.

Model follows strategy

First, we would like to address the significant role of the selected patient condition, encompassing both the type of patient group enrolled in telemonitoring and the complexity of their healthcare needs. The patient condition drives the subsequent considerations that together determine the appropriate organizational telemonitoring model. For example, programs targeting chronic conditions aiming for self-management, typically associated with lower alert frequency and lower clinical complexity, can be organized through distributed care models. Conversely, telemonitoring programs focused on vital parameter tracking, such as those in early discharge scenarios (Azevedo et al., 2021; Breteler et al., 2020; Farias et al., 2020; Liljeroos & Arkkukangas, 2023), having high alert volumes and a need for rapid response, make centralized models more appropriate in those cases (domains 1 and 2). This observation is consistent with the current literature, which suggests that prior to implementation, telemonitoring systems are evaluated for their anticipated impact on patient safety, staff workload and clinical usefulness (Glock et al., 2021; Liljeroos & Arkkukangas, 2023), all of which depend on the specific patient group intended for remote care. This initial strategic decision sets the foundation for the primary objective of telemonitoring, whether that be to enhance self-management (Glock et al., 2021; Nick et al., 2021) or to monitor vital parameters (van Rossum, 2023). Consequently, the selected patient condition and objectives influence the aims, and vice versa. Furthermore, the chosen aims directly affect the volume of alerts generated. For instance, a focus on vital parameter monitoring typically results in a greater frequency of alerts (Kokkonen et al., 2024) compared to a self-management approach. Our findings indicate that the volume of alerts also affects how and for

whom notifications are managed, ultimately shaping workload distribution (Taylor et al., 2015) and task division (Cuba Gyllensten et al., 2017; Gijsbers et al., 2022) among healthcare professionals. Clearly, the interplay between patient condition, strategic objectives, and alert management is critical in determining the appropriate organizational model for telemonitoring. The choice of objectives impacts personnel, capacity, resources, and partnerships, outcomes that affect healthcare delivery in the region. It is crucial not to overlook the need for planning at this level and decision-makers must be educated to consider all the dimensions and understand how their choices will ripple through the system when determining the best telemonitoring model for a patient. Looking ahead, the evolving role of artificial intelligence (A.I.) will likely have significant implications for the organization of telemonitoring (Domain 7). AI has the potential to support clinical decision-making by filtering alerts, identifying patterns, and prioritizing cases (Shaik et al., 2023). In this way, A.I. may reduce the need for centralized monitoring by enabling distributed care teams to manage alerts more efficiently alongside their routine tasks. Conversely, the increasing amount of data and complexity requires centralized systems, where specialized staff works with A.I. to manage the increasing data streams. While the direction of this impact remains uncertain, these technological developments will influence the suitability of different organizational models.

Personnel

In our case studies, the respondents' perceptions of the effectiveness of telemonitoring and its added value for patients played a significant role in choosing a model. Even in the absence of clear evidence supporting the superiority of one model over another, in terms of cost-effectiveness or patient benefit, respondents based their preference on subjective evaluations (Bell-Aldeghi et al., 2023; Scholte et al., 2023; Zhang et al., 2023). This is notable, particularly given that the attitudes of healthcare professionals (e.g., nurses and physicians) are a significant factor in the acceptance of telemonitoring in practice (Liljeroos & Arkkukangas, 2023) and as these professionals are regarded as the 'most important gatekeepers for telehealth services'(Whitten & Mackert, 2005). Thus, the attitudes and perceptions of healthcare professionals influence the implementation of telemonitoring, impacting not only local adoption but also broader upscaling (Gijsbers et al., 2022). Healthcare professionals also play an important role in deciding on the choice of telemonitoring aims in the process of selecting a suitable model.

This makes it essential that their decisions are not based solely on subjective judgments. Rather, they should be well-informed about the rationale behind selecting specific telemonitoring models.

In addition, implementing telemonitoring, whether centralized or distributed, is driven by the objective of increasing efficiency and addressing staff shortages (Levine et al., 2020; Scholte et al., 2023). As patients increasingly adopt self-management techniques (Oudshoorn, 2008; Trupia et al., 2021), and healthcare services evolve, the roles and tasks of healthcare professionals are undergoing significant transformation. The literature supports this shift, indicating that telemonitoring influences task division in healthcare organizations (Wannheden et al., 2022), resulting in the creation of new roles and responsibilities (Boonstra & Broekhuis, 2010) while potentially disrupting established professional roles (Ross et al., 2016). Given this knowledge, organizations must align their personnel preparation and organizational models accordingly. It is essential to equip staff for new responsibilities through targeted training programs that address the specific skills needed for telemonitoring (Banbury et al., 2023; Sidhu et al., 2023). Additionally, our findings show that the redistribution of tasks, particularly when tele-nurses assume responsibilities previously handled by physicians, was eased by collaborative efforts in developing protocols and workflows. Finally, the division of created tasks should be compatible with the organizational model and available resources. Therefore, when selecting a telemonitoring model, organizations should consider their capacity, resources, and personnel.

Partnerships, collaborations and networks

Our findings place key emphasis on the importance of partnerships and collaborations in organizing telemonitoring, particularly in the centralized monitoring context although both models may involve multiple organizations (Dharmarajan & Chaudhry, 2016; Eze et al., 2020). The participants acknowledged both the potential benefits of working with various partners and the challenges associated with delegating tasks among healthcare providers. However, the discussion focused on the division of tasks between providers and clinical pathway design, while the complexities of inter-organizational collaboration remained largely unaddressed. This oversight parallels a notable gap in the literature on organizing telemonitoring collaboratively. Defining responsibilities, establishing safety protocols, streamlining workflows, sharing knowledge and educating personnel are all important when multiple organizations participate in

telemonitoring (Liljeroos & Arkkukangas, 2023). While some studies touch upon inter-organizational collaboration among healthcare providers (Liljeroos & Arkkukangas, 2023), there is still insufficient exploration of the necessary governance and management frameworks required for telemonitoring collaboration in practice (Peeters et al., 2023; Provan & Kenis, 2008). This is concerning from a quality perspective, given that effective collaboration between care providers is essential for ensuring continuity of care (Thomas et al., 2021). Scholars suggest that successfully scaling telemonitoring on a regional or national level hinges on resources and reimbursement structures (Gijsbers et al., 2022). Both elements should be discussed when collaboratively organizing telemonitoring. Given that network theory offers valuable insights into managing networks with common goals, in this case regional telemonitoring implementation, we want to emphasize that scholars should not reinvent the wheel when there is a compelling opportunity to use this knowledge to navigate organizational boundaries effectively (Otte-Trojel et al., 2017).

Strengths and limitations

From a practical perspective this research contributes to a deeper understanding of the decision-making processes involved in telemonitoring services. The insights derived from this study offer valuable guidance for healthcare organizations seeking to implement or scale telemonitoring programs, or to design effective telemonitoring pathways with regional partners. From a theoretical standpoint, this study extends the application of the NASSS framework by examining organizational-level decision making across all NASSS domains. In doing so, we illustrate how the various domains interact and influence one another in the context of organizing telemonitoring. We acknowledge, however, three primary limitations. 1) While the NASSS framework provides a comprehensive approach to integrating diverse perspectives on implementing e-health technology, these categories may constrain data interpretation. Specifically, the framework tends to overlook the relational dynamics, for instance between caregivers and patients, despite the literature that supports the importance of including human interactions in implementation (Glock et al., 2021). Future scholars could benefit from utilizing NASSS-CAT tools (Greenhalgh et al., 2020). This combination allows for a theory-informed framework, supplemented by a pragmatic planning tool. 2) The limited exploration of ethical-legal considerations and data privacy in the context of telemonitoring may be attributed to the

specific respondent group chosen for inclusion. Issues related to data sharing, patient consent, and privacy must be addressed to ensure the ethical deployment of telemonitoring technologies (Liljeroos & Arkkukangas, 2023). These legal and ethical topics should be prioritized in future research to provide a more comprehensive understanding of the implications of telemonitoring on patient data and privacy rights. Another limitation lies in 3) the aim to contrast a centralized model with a fully distributed one. However, in practice, such clear-cut models are hard to find. As a result, we included two cases employing predominantly distributed models, where respondents also had experience with centralized approaches or used centralized models for specific clinical pathways. Although this hybrid reality (literature) reflects the complexity of studying real-world implementation, it blurs the distinction between the two models

Conclusions

This study provides insights into the complexities of decision-making involved in organizing telemonitoring and offers guidance to all stakeholders, including healthcare professionals, on understanding the considerations and consequences of the choices. It identifies specific rationales for selecting either centralized or distributed telemonitoring model, depending on patient needs, such as those requiring vital parameter monitoring, or on self-management. The volume of notifications generated also is a critical factor in determining the most suitable model. Additionally, perceptions of efficiency and the perceived added value to patients significantly influence decision-making. The study underscores the importance of considering technological, organizational and societal factors when choosing between centralized and distributed models. Notably, decisions made in early stages, primarily by physicians, can have far-reaching implications for personnel, resources and partnerships at a regional level. When starting out with telemonitoring, those in charge should recognize the interconnectedness of factors and carefully consider all seven NASSS domains.

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Chapter 3



Network Commitment

How do network coordinators in Dutch Healthcare networks maintain network commitment?

Chapter 3

A dynamic model to sustain the spark: How do network coordinators in Dutch healthcare networks maintain network commitment?

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Abstract

Context: In the Netherlands inter-organizational networks have been established to drive long-term healthcare improvement on a regional and national scale. Managing healthcare networks is challenging, especially in sustaining participants' active engagement. This study aims to empirically explore why participants' network commitment declined and how network commitment was managed by network coordinators.

Methods: We conducted an exploratory qualitative study using purposive sampling we held semi-structured interviews with representatives from 18 Dutch healthcare improvement networks.

Results: Respondents mentioned that allocated time and continued participant commitment was required to reach their goals. A key challenge was the decline in participant commitment over time due to misalignment of goals and needs, slow progress, lack of reciprocity, and resistance to change at the organizational level. Approaches to manage this were collaborative reassessment of goals and needs, expectation management, setting preconditions and fostering personal relationships.

Discussion: Our findings highlight the importance of strategic timing of managerial approaches and their interdependencies with social mechanisms. These insights contribute theoretically to Ring and Van de Ven's framework on developmental processes of cooperative interorganizational relationships and offer practical guidance for network managers aiming to maintain long-term commitment.

Introduction

Healthcare systems worldwide are under increasing pressure due to a variety of challenges, including a rising demand for healthcare services and their quality, cost containment, improving patient experiences, and ensuring a sustainable work environment for healthcare professionals(Hefner & Nembhard, 2021; Sikka et al., 2015). Due to their high complexity, these challenges cannot be addressed by individual organizations. Instead, they require collaborative approaches that bring together multiple organizations and stakeholders to develop integrated, sustainable solutions(Hearld & Westra, 2022; Peeters et al., 2023b). Consequently, inter-organizational network collaboration has become increasingly prevalent in public and private sectors(Yonek et al., 2010). They serve as platforms for joint problem-solving and provide channels for knowledge exchange and policy implementation(Malby & Anderson-Wallace, 2016; Mervyn et al., 2019; Provan & Kenis, 2008).

The Netherlands is no exception to these challenges and this collaborative trend. Various policy initiatives and structural reforms have encouraged the development of healthcare networks that facilitate integrated care service delivery to enhance patient safety and organize care closer to home(Van de Bovenkamp et al., 2017; Van Der Woerd et al., 2024). A practical example is a regional network focused on optimizing the care pathway for elderly patients living in vulnerable circumstances at home. Such an initiative demands collaboration between general practitioners, home care providers, emergency services, welfare, and local policymakers. The Dutch Ministry of Health offers funding to nation-wide programs to accelerate improvements via multi-organizational partnerships in networks aiming for shared learning (Knight et al., 2022). For example, the Healthy and Active Living Agreement (GALA) or the Integral Care Agreement(Peeters et al., 2024). Achieving such improvement goals requires the long-term active involvement of a wide range of stakeholders working in close collaboration. These actors must jointly assess existing practices, identify opportunities for improvement, and implement changes across multiple organizations. This change trajectory is inherently complex, as stakeholders' priorities and perspectives often differ and evolve over time. Therefore, this complexity requires more than an initial agreement; it depends on sustained commitment and shared ownership to drive and maintain meaningful change. In this paper we explore networks aiming to improve healthcare.

Inter-organizational networks and network commitment

Inter-organizational networks, including healthcare networks, enable organizations to pool diverse resources, share knowledge, and work toward a common goal(Provan et al., 2003). Research has shown that networks can improve care quality by enhancing care coordination through collaborative professional relationships(Cunningham et al., 2012). Also, networks enhance physician performance by fostering social capital(Malby & Mervyn, 2012). On a national level, networks can play a crucial role in implementing national policies, facilitating major service reconfiguration, and securing clinical engagement(Ferlie et al., 2010). For networks to be effective and attain their goals - particularly in the context of healthcare improvement-, networks must remain stable and foster sustainable collaboration(O'Toole, 2004; Provan & Lemaire, 2012). Sustainable collaboration relies on a foundation of shared values, trust, and effective communication, particularly supported by senior leadership(Castiglione & Lavoie-Tremblay, 2021). Additionally, Provan and Kenis emphasize the importance of goal congruence, trust, and governance in maintaining networks(Provan & Kenis, 2008). An additional critical factor for network sustainability is network commitment, which can be understood as an organization’s intention to stay in the network and actively contribute to make the collaboration a success(Milward & Provan, 2006). Network commitment encompasses an active engagement and psychological attachment(Clarke, 2006). High network commitment levels foster the quality of decision-making and maximize collaborative efforts and success (Castiglione & Lavoie-Tremblay, 2021; Milward & Provan, 2006; Provan & Lemaire, 2012) Moreover, it reinforces trust among participants, strengthens interpersonal and inter-organizational collaboration(Clarke, 2006).

The importance of network commitment for inter-organizational collaborative structures relates to one of the fundamental characteristics of inter-organizational networks: dispersed hierarchy and control(Grolman et al., 2025). In inter-organizational networks, decision-making is shared between legally autonomous entities and not unified within one organizational structure. Following Clarke(2006) , network commitment is, therefore, regarded as a coordinating mechanism to compensate for the lack of behavioral (process) control and traditional intra-organizational hierarchy.

Maintaining commitment at adequate levels among participants is far from easy. Causes for commitment decline include insufficient time and resources to execute tasks as needed, an

imbalance between the network and organizational goals (Shin et al., 2020), and a too centralized decision-making. This is reinforced when participation is voluntary, loosely coupled, not contractually enforced(Henry & Möllering, 2023), and simultaneously network goals are long-term(Cheng et al., 2004). In this paper we elaborate on network commitment of healthcare networks with long-term goals.

Managing networks

Managing healthcare networks has proved to be challenging, as it requires continuous coordination among multiple stakeholders, including healthcare professionals, hospital managers, insurers, and policymakers(Van Der Woerd et al., 2024). Network managers need to balance competing interests, allocate resources efficiently, and align long-term strategic goals(McGuire, 2002). Several risks can threaten network stability and may lead to network failure, such as micro-management, lack of institutional flexibility, limited collective strategy, insufficient knowledge sharing, and prioritization of individual interests over collective goals(Ospina & Saz-Carranza, 2010; Tunisini & Marchiori, 2020). Given these complexities, it is crucial to get a clear insight and understanding of the contributing factors to maintaining commitment and achieving the network goals(Milward & Provan, 2006). While existing research predominantly has focused on network effectiveness, including governance structures, role clarity, and shared purpose(McGuire, 2002) there remains a limited understanding of how to sustain network commitment over time(Hearld et al., 2019). This is particularly relevant because a deeper understanding of how networks function and evolve is vital for network managers aiming to maintain engagement(Cunningham et al., 2012).

This study aims to empirically explore if, and why the network commitment of participants declined and how network commitment was managed by network coordinators in Dutch healthcare improvement networks. By exploring the factors influencing the development of network commitment and the approaches coordinators used to maintain engagement, this research will provide insight into the management of network commitment within the Dutch healthcare context. Ultimately, the findings will contribute actionable recommendations for network managers seeking to enhance participant engagement and ensure network sustainability.

Methods

To gain an in-depth understanding of how network commitment may decline, and how this is managed by network coordinators in Dutch healthcare improvement networks, we conducted an exploratory, qualitative study using semi-structured interviews. This study was part of a commissioned research project called "Time to Connect", which aimed to enhance network collaboration to enhance patient safety in Dutch hospitals and private clinics. We followed the consolidated Criteria for Reporting Qualitative Research (COREQ) to report the study (see Appendix 1). Ethical approval was secured from the Ethics Review Board before study commenced [blinded for peer review]. Data storage is compliant with the GDPR.

"Time to Connect"

The nationwide patient safety program "Time to Connect" focused on some of the most prevalent safety risks in the Netherlands, including anticoagulation care, frail elderly care, and multidisciplinary care for complex cases. The program fostered resilient behavior of healthcare professionals by offering collaborative learning and transference of positive deviance practices through networks in which reflection-and-improvement sessions were facilitated. One example of inter-organizational collaboration aimed for quality improvement was the establishment of a network to optimize the care (pathway) for frail elderly. This network required the involvement of general practitioners, care and welfare providers, emergency services, and local policymakers on organizational and municipality level. The reported study was undertaken to support the development of the 'Time to Connect' program. By studying the evolvement of network commitment in other national programs, insights were gained into how to establish vibrant and sustainable networks.

Inclusion criteria

To ensure a diverse and representative sample, we used a maximum variation sampling which is one of the purposive sampling methods described by Patton (2002). We started by mapping existing Dutch healthcare networks that operate(d) at either regional or national level and aim(ed) for improving healthcare. The network improvement goals varied and included enhancing patient safety for a specific patient group, strengthening shared-decision making for patients, or improving operational management (e.g., reduction of waiting times, development of

care pathways etc.). To ensure a comprehensive overview, we sampled networks that varied in size, participation requirements, funding, leadership and governance modes, and anticipated outcomes. Exclusion criteria included networks comprising fewer than three organizations, networks focusing solely on knowledge exchange without broader improvement goals, short-term inter-organizational projects, or newly established networks.

Data collection

The recruitment period spanned from February to September 2023. Interviewees were required to hold a formal leadership or managerial role in the networks (e.g., director, program leader, project manager, or coordinator), ensuring they had direct experience with network functioning. Additionally, we interviewed network advisors who had previously participated in networks that suited our inclusion criteria. Table 1 provides an overview of the respondents' characteristics and network-specific attributes, including types of professionals involved as participants, funding structures, and governance models. Contact persons of eligible networks were contacted by email inviting them to participate. The invitation outlined the purpose of the study and included an informed consent form. Recruitment continued until thematic saturation was reached, resulting in a total of 18 interviews with responsible managers of Dutch healthcare networks. One network program manager declined participation, due to maternity leave.

Two researchers (DvdS, MR) conducted the semi-structured interviews online, using Microsoft Teams. The interviews followed a predefined topic guide (see Appendix 2) that stemmed from a literature search on barriers and facilitators for healthcare improvement in inter-organizational networks. Before each interview, respondents provided verbal informed consent, which was audio-recorded. Interviews were automatically transcribed verbatim using the transcription tool in Microsoft Teams. Afterward, transcripts were manually checked for accuracy and pseudonymized by removing personal identifiers.

Data Analyses

Transcripts were analyzed using inductive thematic content analysis following Braun and Clarke's six-step framework(Braun & Clarke, 2006). The analysis was conducted using the analysis software Atlas.ti.24. First, one researcher (DvdS) read, and openly coded the transcripts of four interviews. These initial codes were used to form an initial coding tree consisting of four

preliminary themes and (sub)concepts. By axial coding, the remaining interviews were coded using the coding tree by assigning axial codes and by adding new open codes, concepts and sub-concepts. Throughout the entire analysis process, researchers from different disciplines (DvdS, MR, AWJ) discussed the coding tree up to consensus. Gradually, in close collaboration we finalized the coding tree. We validated the coding tree during a session with employees of the "Time to Connect" program. After 18 interviews, thematic saturation was reached.

Results

The representatives of the networks aiming for healthcare improvement all mentioned that their network required financial and personnel resources, but most importantly time. As one respondent noted:

> "*Arranging a network is so complex. It's not just the issues that require collaboration, but the collaboration itself takes time, as well as organizing it.*" (*P7: Network coordinator)*

Coordination of network management tasks was often entrusted to an appointed project leader, also referred to as a network coordinator. Depending on the nature of the network, this coordinator could be a medical professional, a manager of one of the participating organizations, or an external party. This person facilitated connections between organizations, motivated participant contribution, and disseminated valuable lessons among participants.

A key network management challenge mentioned by these coordinators was the declining commitment of participants over time. Even though commitment to the network was present at the start of the network, over time, network participants often became less engaged. In the following section, we elaborate on 1) the main reasons for participants' decline in network commitment; and 2) the strategies or interventions used by the network coordinator to counteract this decline or to restore commitment.

Reasons for declining network commitment of participants

Generally, the initial commitment of participants to actively engage within the network was strong, often driven by an intrinsic sense of urgency for healthcare improvement and a genuine desire to improve the care quality and safety. Additionally, some network participants were

motivated by funding opportunities, while others engaged due to external requirements, such as mandates from healthcare insurers or government policies. However, in many cases, network commitment eventually declined.

One of the main reasons for this decline was the misalignment between the network's objectives and the evolving needs of its participants. Although a common goal was agreed upon at the start of the network to foster alignment and engagement, discrepancies emerged as the network progressed. As the organizational priorities and expectations shifted, some participants experienced a growing disconnect between their needs and the overarching network aims, ultimately leading to decreased involvement.

A second reason for network commitment decline arose when participants did not experience immediate progress toward reaching the defined goals, particularly in networks with inherently lengthy processes. The slow pace of progress, often due to complex, multidisciplinary challenges, led to declining motivation and commitment over time. This was particularly evident among network members who got involved in the early stages of the network. In contrast, participants who joined an already operational network often experienced quicker results, reinforcing their commitment to the network. The following quote illustrates this:

> *"So, those who joined later saw results immediately, which is great. Naturally, they were highly motivated by this, whereas people from the first hour, the initial five healthcare organizations had to work quite hard to achieve these results. At some point, you realize you need to invest extra energy to keep them [early participants] motivated. It's a long-term process, and it needs speed, but ultimately you get a better outcome together than going it alone. You make more progress with collaboration, really. Still, the first healthcare organization had to go on a long journey. Now we have the results it's okay, but in that preceding phase, it was a bit challenging."* (*P5: Managing director of a network*)

A third key reason for declining commitment among network participants was a lack of reciprocity in the collaboration within the network. Many participants joined the network because of the opportunity to exchange knowledge, such as sharing best practices, experiences, and insights. This knowledge exchange was considered crucial for initial commitment. However,

over time the knowledge sharing between participants proved to be unbalanced. Consequently, the overall commitment weakened. When participants experienced that sharing their knowledge was not answered by getting something in return, they became less inclined to actively continue their sharing behavior. The quote below illustrates how ongoing reciprocity is needed for commitment:

> *"When you can find those things elsewhere, [active participation] becomes redundant, so to speak. Well then, perhaps it's less worthwhile to invest effort in it, because, again, a network is built on reciprocity. If you invest time in bringing about something and taking something out of it, you need ongoing reciprocity. Otherwise, at some point, the costs outweigh the benefits."* (*P8: Network coordinator*)

This lack of reciprocal engagement was also present when some participants joined the network solely to acquire insights for their organization or to secure funding, without actively contributing to the network. This behavior was sometimes attributed to opportunism, or to work-related pressure, as network participation is often an additional responsibility and task on top of the existing workload.

Lastly, resistance to change within participating organizations contributed to declining network commitment. While organizations were initially eager to collaborate on the objective of improving care, challenges arose when new working practices developed, which required changes within the organizations. In some cases, employees within participating organizations resisted change due to increased workloads, disruption of routines, or financial constraints. This internal pushback sometimes led participants to become less engaged.

Managerial Approaches for dealing with network commitment decline

Network coordinators used various approaches to manage their network and to prevent a decline in participants' network commitment. One of the approaches was regular assessment of the network objectives to ensure they remained aligned with participants' evolving needs. To identify rising discrepancies between the network's goals and the needs of its members, network managers conducted periodic evaluations, either through surveys or in-person discussions. When misalignments were detected, adjustments could be made to realign the objectives and maintain

commitment. This quote exemplifies that adjusting objectives is needed to solve a problem, but also to keep participants committed:

> *"Our goal is not to just keep the network active. We're really trying to solve a problem. But when it comes to keeping a network effective over time? Yeah, how do we do that? I believe it's by not adhering too rigidly to the chosen format or sticking to it indefinitely, right? [...] With everything you do and every time you come together, just ask critically, why are we doing this? So, you don't end up with people sitting at meetings only because they've been doing it for ten years already and everybody has lost interest, but yeah, it's on the agenda."* (*P10: Managing director of a network*)

Another approach to maintain commitment was managing participants' expectations, particularly for early-stage participants. By clarifying and stressing at the outset, that goal attainment takes time, and yield long-term benefits, participants are less likely to become discouraged when immediate results are not emerging. It was helpful to explain that participating can ultimately be beneficial to both the network and the participating organizations. In addition to expectation management, highlighting successes – even incremental ones – was an effective way to reinforce or re-establish motivation. This reassured participants that their contributions were making a difference, strengthening their willingness to stay engaged.

Ensuring reciprocity within the network was another crucial approach. Network coordinators employed various measures to foster mutual knowledge sharing and shared responsibility. Some networks set certain preconditions for participation, such as expected contributions (e.g., financial, in-kind, free flow of knowledge) or mandatory attendance at key meetings. Others enhanced engagement by rotating network meeting hosts, encouraging participants to suggest agenda topics and thereby fostering a sense of ownership by every member. The reciprocal engagement was advanced by trust-building among the participants. To build this trust, it was crucial to have transparency about individual benefits of participation, as well as the potential collaboration challenges.

A personal approach of the network coordinator towards the network participants and fostering inter-organizational connections were also needed when resistance to change arose at the organizational level. Creating and maintaining personal connections helped to create a form

of accountability and ownership for continued collaboration. Personal connections were mainly established during social events, hosted by the network managers.

> *"I reckon the most important aspect is that we know who's who and what we all do. So, we're constantly getting a clearer idea of people, and we keep on getting better at finding each other. That's really how a network works. You can connect as organizations, but if you don't know how to find the right person or don't have their number, or you don't see each other often enough, then too little actually happens. It comes down to, once you know someone well, you can rely on them. You must pay extra attention [to personal contacts], organize extra meetings, almost informally. We need this to actually achieve things."* (*P6a: Network researcher*)

Furthermore, involving senior leadership, such as the participating organizations' board members, proved to be a crucial strategy for overcoming organizational resistance to change as well. As board members often played a key role in decision-making processes, this higher-level support helped to prevent resistance and disengagement.

> *"If you look at the organizational level, what is helpful, is that we have a well-structured board that is truly committed to what we are doing in our pilot and actively promote it within their own hospital. That's one important factor. However, of course, it is not enough to only have engagement at that level. You see that it takes time to also embed this awareness at the lower levels—to really get it into people's minds that there is something like [network name] and that they can benefit from it"* (*P5: Managing director of a network)*

Discussion

Collaboration in networks of healthcare providers is primarily driven by the desire to improve healthcare delivery or care quality and safety(van der Schors et al., 2021). With these objectives, maintaining commitment over time is essential for sustaining collective efforts, attaining common goals, and ensuring continued progress(Ansell & Gash, 2007; Kramer, 2014/6/13; Shin

et al., 2020). While previous literature has acknowledged the importance of network commitment (Clarke, 2005, 2006; Morgan & Hunt, 1994) and identified several influential factors such as trust, shared purpose, and governance structures (Andrésen et al., 2012; Clarke, 2006; Kramer, 2014/6/13; McGuire, 2002; Page, 2010; Scott, 1987), there remains limited empirical insight into how network coordinators manage network commitment in practice. This study addressed this gap by exploring how network coordinators in Dutch healthcare improvement networks approached the challenge of declining network commitment. Table 2 provides an overview of the identified reasons for declining network commitment, alongside the corresponding approaches used to address them.

Table 2: Reasons for declining network commitment and managerial approaches	
Reason for declining network commitment	
R1	Rising discrepancies between network objectives and participants' needs
R2	The slow pace of progress
R3	The lack of reciprocal engagement
R4	Resistance to change at the organizational level
Managerial approach	
A1	Identify discrepancies through periodic evaluations and adjust objectives if necessary
A2	Manage the expectations of participants and celebrate (small) successes
A3	Set preconditions to foster equal contribution, create ownership and build trust among participants
A4	Include senior leadership of the participating organization and foster personal connections and

To position and demarcate this study's theoretical contributions, we make use of relevant reviews studies that recently have been published in the field of healthcare networks. The scoping review by Carmone et al(2020), 2020 offers a thorough conceptualization of healthcare networks and a mapping of their activity domains. The healthcare networks investigated address complex problems, all aiming for system wide changes, which fall in the so-called 'learning and

adaptation' domain. The relevance of this domain is acknowledged; still, this area is understudied, as this scoping review found the lowest number of insights in this domain. This observation makes this study of healthcare networks dealing with complex problems therefore timely and relevant. Additionally, a systematic literature review by Van der Weert(2022), showed the fragmented nature of the scientific insights on healthcare network and the mixed empirical findings on the relationship between network structures and governance modes on the one hand, and healthcare network performance at different levels on the other hand. The authors(van der Weert et al., 2022) observed that the literature predominantly focuses on healthcare networks' structural aspects, whereas intermediate processes such as involvement and commitment attract far less scholarly attention. Furthermore, network commitment already captivated academic curiosity in the past. Following the collaborative governance framework (Belrhiti et al., 2024), network commitment is regarded as an integral part of collaborative dynamics. More specifically, network commitment is conceptualized as a dimension of shared motivation together with mutual trust and understanding, and internal legitimacy. These collaborative dynamics are the engine that drives Collaborative Governance Regimes, such as healthcare networks, to collaborative action. However, Belrhiti et al.(2024), found that most studies concentrate on commitment building at the early formation stage of healthcare networks. How network coordinators manage network commitment is, however, an unexplored area, which need scholarly attention in light of problem complexity and the stable and sustainable engagement required to address it. By providing an overview over the reasons for declining network commitment and the approaches used to address these, we offer new insights.

Our theoretical contribution builds on and extends Ring and Van de Ven's theoretical framework concerning the developmental processes of cooperative interorganizational relationships(Ring & Van de Ven, 1994). The framework outlines three cyclical stages of interorganizational cooperation. Stage one, negotiations, is when the expectations, roles, and resources are aligned. Stage two, commitments, includes choosing the approach, governance structure, and trust-building. The third stage, execution, involves executing these commitments through actions. Given the central and enduring role that this renowned framework attributes to network commitment, makes the framework particularly suitable for conveying the study's theoretical contribution.

Figure 1. *A dynamic model for network commitment decline and managerial approaches*

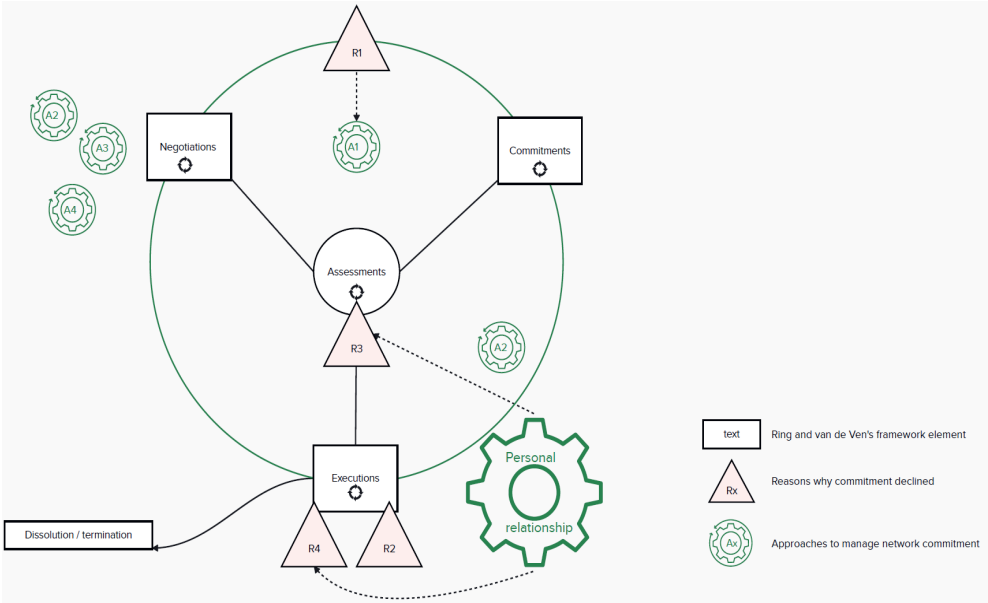


Figure 1 emphasizes the interdependency between managerial actions in different stages and their social mechanisms. We argue that network participants' needs may evolve, potentially leading to misalignment (R1) with the network goals(Auschra & Sydow, 2022). This affects goal attainment, network effectiveness, and weakens network commitment, as even the perception of misalignments creates dissatisfaction among participants with the network and reduces commitment(Andrésen et al., 2012; Haas, 2023; Morgan & Hunt, 1994; Provan & Kenis, 2008). In the framework, these tensions are positioned between the negotiating and commitments stage and ask for a reflective cycle between negotiation and commitment stages, focusing on assessing goals and needs as one approach to managing commitment(A1).

By emphasizing the importance of strategic timing in managing decline of network commitment we call upon specific managerial actions in one stage in order to be effective in other stages and maintain the commitment. For instance, during the execution stage, a perception of slow progress (R2) may arise. One way to manage this is by highlighting early wins (A2) in the execution stage to counteract perceptions of slow progress, build confidence, and motivate subsequent accomplishments. This could lead to higher commitment(Peeters et al., 2023a; Scutchfield et al.,

2021). The management of expectations (A2) should however begin when joint goals and expectations are established in the negotiation stage. Additionally, lack of reciprocity (R3) especially arises in the execution stage. Bi-directional knowledge sharing is crucial for engagement in healthcare networks. To facilitate reciprocity, network coordinators can establish a set of preconditions(A3), which need to be introduced in the negotiation stage. Lastly, in the execution stage resistance to change (R4) can arise at the organizational level when several collaborative cycles have passed. Involving board-level leadership and securing mandates (A4) in the negotiation stage are helpful. In the negotiation stage, network coordinators should assess whether the most relevant stakeholders are involved, as this is key for effective network functioning. Through these examples, the adjusted Ring and Van de Ven's framework(Ring & Van de Ven, 1994)demonstrates that managing network commitment in healthcare improvement networks is not a linear process, but rather one of anticipating challenges across different stages.

Interdependencies

In addition to mapping the reasons for network commitment to decline and the corresponding managerial approaches across the stages, our study also expands on the role of personal relationship building over time. While the original Ring and Van de Ven's framework(Ring & Van de Ven, 1994) emphasizes that repeated cycles of negotiation, commitments, and execution strengthen interpersonal relationships, this study shows how this process is as a turning wheel, activated through ongoing collaboration.

Our figure pictures repeated cycles of negotiation, commitment, and execution in which interpersonal relationships and trust-building play a role in mitigating two sources of declining network commitment: resistance to change at the organizational level and a lack of reciprocity. Participants are more likely to share information and knowledge when they trust each other, and information sharing is not a one-way effort. Conversely, when participants perceive a lack of reciprocal benefits, especially over time, they tend to disengage, share less, and gradually lose trust, leading to reduced commitment to the network(Thomson & Perry, 2006). However, such relationships do not develop instantly as they must be built gradually through repeated collaborative cycles and require active engagement from participants throughout(Ring & Van de Ven, 1994). As such, personal relationships are both an outcome of ongoing interaction and a

critical condition for preventing network commitment from declining. This feature underscores the interdependent nature of managing network commitment in healthcare networks.

Limitations

One limitation is that our study did not comprehensively explore the various levels at which network commitment operates. Existing literature indicates that commitment can manifest at the individual, organizational or network level(Dunham et al., 1994). While some of our respondents shared their experience of commitment at different levels, our analysis did not delve into how these levels of commitment interact or influence one another. Future research should focus on understanding the interplay between commitment at the individual, organizational, and network levels. Such insights will provide a better view of network dynamics and enable even further the development of targeted network strategies.

Conclusion

Our study focused on how network coordinators of Dutch healthcare improvement networks managed the network commitment of participants. Using an exploratory design we have identified why network commitment declines and which approaches network coordinators used to manage this. We have incorporated these reasons and approaches into Ring and van de Ven's framework(Ring & Van de Ven, 1994) emphasizing the importance of strategic timing of managerial approaches and the interdependency with social mechanisms. Additionally, we have visualized how personal relationships are both an outcome of ongoing networks and a critical condition for preventing network commitment from declining. These insights provide both a theoretical contribution as actionable recommendations for network managers.

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Chapter 4



Brokerage Behavior in Healthcare Networks

A Qualitative Study on Knowledge Exchange and Innovation Dissemination

Chapter 4

Brokerage Behavior in Healthcare Networks: A Qualitative Study on Knowledge Exchange and Innovation Dissemination

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Submitted

Abstract

Background

Healthcare Networks provide a vehicle for collective learning, improving care quality, exchanging knowledge and disseminating innovations. Individuals within healthcare networks play a critical role in facilitating this process by bridging organizational boundaries, also referred to as brokerage. Understanding brokerage behavior enables networks to disseminate innovation more efficiently across organizational boundaries. This study builds on previously identified broker roles by Gould and Fernandez and aims to explore how actors collaborate as brokers in healthcare networks aiming to disseminate innovations across organizational boundaries.

Methods

This qualitative case study was conducted within a network of 27 hospitals, drawing on observations, semi-structured interviews and a focus group. Data were analyzed thematically following Braun and Clarke's framework.

Results

Based on the typology of Gould and Fernandez, five brokerage roles were examined, each enacting distinct activities within the healthcare network and requiring competencies to fulfill their broker role; *Coordinator*: connects employees internally and requires communication skills and innovation expertise. *Gatekeeper*: acquires and assesses external knowledge, relying on networking skills and understanding organizational challenges. *Representative*: shares innovation and builds alliances, drawing on research experience and strategic collaboration skills. *Liaison*: bridges organizational boundaries, using social and coordination skills. *Cosmopolitan*: connects teams across departments, requiring project management and interdisciplinary knowledge.

Conclusion

While most brokerage research in healthcare networks focuses either on brokers' structural positions or on their enacted behaviors, this study integrates both perspectives. Building on the five brokerage roles conceptualized by Gould and Fernandez, we examine how actors as brokers, occupying distinct network positions, enact role-specific activities to facilitate the dissemination of healthcare innovations. Although these roles may appear to involve overlapping activities and competencies, their enactment is highly context-dependent and requires differentiated skill sets. Recognizing the distinct brokerage roles and their context-specific competencies, enables

healthcare networks to configure brokerage roles and the networks' ability to disseminate innovations effectively.

Introduction

Healthcare delivery is increasingly organized across multiple providers and care settings, including the patient's home, thereby requiring sustained collaboration and coordination across organizational boundaries. Such coordination is frequently organized in inter-organizational collaborations, commonly referred to as healthcare networks(Peeters et al., 2023; van der Weert et al., 2022). Healthcare networks can be defined as collaborations of at least three organizations that jointly pursue a shared goal(Provan & Kenis, 2008), such as improving the quality of care for elderly patients regionally(Brown et al., 2016; Van Der Woerd et al., 2024). Beyond serving as structures for optimizing care delivery, healthcare networks also function as platforms for collective learning and knowledge exchange(Knight et al., 2022). By connecting diverse professional groups and organizational domains, they enable participants to access otherwise unavailable expertise, compare practices, and engage in joint problem-solving(Van Vooren et al., 2024). Through interactions between actors within the network they create conditions for mutual learning, exposure to emerging innovations and ultimately enable the spread of innovations across organizational boundaries(Leis, 2025; Lennox et al., 2022). This is particularly relevant as many innovations remain confined to their local context. While local innovations may generate value for individual organization, its broader impact depends on the exchange across organizational boundaries(Greenhalgh & Papoutsi, 2019).

Adoption, implementation, dissemination and diffusion

To understand how innovations move within such networks and across organizational boundaries, it is necessary to distinguish between several related but conceptually distinct processes. In short, adoption refers to the decision of an individual or organization to begin using an innovation(Greenhalgh et al., 2017). Implementation encompasses the planned process of integrating an innovation into existing routines and workflows within a specific context. This typically focuses on what happens after the initial adoption decision(Scarbrough & Kyratsis, 2022). Dissemination denotes the intentional and targeted distribution of information and materials of an innovation to defined audiences. Diffusion, in contrast, describes the more passive and often informal spread of an innovation across a social system(Scarbrough & Kyratsis, 2022). Spreading involves the deliberate replication of an innovation across additional sites or units, enabling broader adoption under comparable conditions(Greenhalgh & Papoutsi,

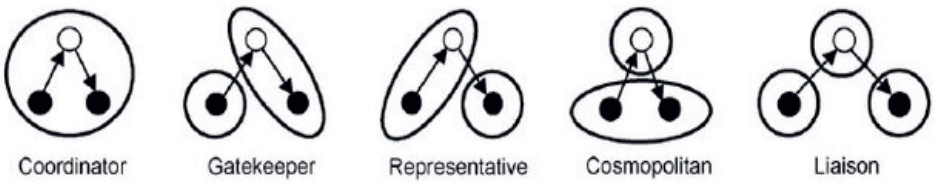
2019). Finally, scaling refers to coordinated efforts to expand the reach and systemic impact of an innovation so that it benefits a larger population(Greenhalgh & Papoutsi, 2019). This chapter focuses on how innovations are disseminated within healthcare networks.

Actors as brokers

While healthcare networks provide the infrastructure for disseminating innovations, thereby amplifying their potential across the healthcare system, the actual knowledge exchange depends largely on individuals (e.g., actors) within the network who connect disparate and disconnected groups across organizational boundaries(Cunningham et al., 2012). These individuals, commonly referred to as 'brokers', play a critical role in facilitating knowledge exchange, translating insights across contexts, and ultimately enabling the dissemination of innovative practices throughout the network(Cross et al., 2023; Kislov et al., 2016; Long et al., 2013; Scarbrough & Kyratsis, 2022). Research has traditionally examined brokers from a structural perspective, focusing on *where* they are positioned in a network. Long et al. (2013) however argue that understanding brokers as a purely structural phenomenon is only one side of the coin; the other side is understanding the behavioral aspects of brokerage, meaning what brokers actually *do*, how they interact and how their actions contribute to the dissemination of innovations within healthcare networks(Cunningham et al., 2012). Gould and Fernandez (1989) have developed a typology of five different broker roles, each defined by the broker's position in the network (e.g. within the organization or between organizations), direction of the information exchange, and some behavioral aspects (e.g., connects, mediates, transfers). The ellipses of Figure 1. correspond to organizational boundaries, and the open points represent the broker positions. The broker as *coordinator* occurs when all three actors belong to the same organization, and thus, information is brokered within a single organization. Thus, the *coordinator* acts as the local broker. The broker, as a *gatekeeper*, gets information from an actor from another organization and shares this knowledge with actors in their own organization. The broker, as a *representative* transfers information from outside their organization to an actor from a different organization. The broker, as a *cosmopolitan* mediates information between two actors from the same organization, while the broker belongs to a different organization. The broker, as a liaison, transfers information between two actors from distinct groups without having prior allegiance to either(Gould & Fernandez, 1989; Neal et al., 2015).

Figure 1 Visualization of five distinct broker roles of Gould and Fernandez (1989) visualization by Kirkels and Duyster (2010)

- Coordinator: enhances interaction between members of the group he belongs to
- Gatekeeper: absorbs knowledge from a group and passes its to the group he belongs to
- Representative: diffuses knowledge of the own group to another group
- Cosmopolitan (Itinerant): mediates as an outsider between members of the same group
- Liaison: enhances as an outsider interaction between different groups



Although the position of a broker in the network determines the access to other groups, it does not in itself guarantee knowledge exchange, adoption or dissemination of innovations. Structural positions create the potential for brokerage; the actual dissemination of innovations depends on whether and how individuals interact in those positions(Yamanie et al., 2023). Therefore, a sole focus on the structural position of brokers provides only a partial explanation of how innovations move across healthcare networks. Accordingly, increasing attention has been directed toward the behavioral aspect of brokerage, emphasizing the activities brokers enact(Bornbaum et al., 2015; Kislov et al., 2016; Turnhout et al., 2013). Yet, focusing on behavior without considering the position of the broker seems equally incomplete. Moreover, brokering activities are highly context-specific as the actions required to transfer and translate knowledge depend on the setting and its stakeholders(Dobbins et al., 2009). This chapter therefore examines the five distinct broker roles, previously identified by Gould and Fernandez(1989), within a healthcare network established to foster innovation dissemination. The research question is: In what ways do brokers collaborate in healthcare networks tpo disseminate innovations across organizational boundaries?

Despite growing recognition of brokerage in healthcare, empirical evidence on behavioral manifestation of broker roles in healthcare networks remains limited(Cross et al., 2023). By identifying brokerage behavior in this context this study aims to advance the understanding of what brokers do to enable innovation dissemination. Identifying such behavior is a necessary

step towards recognizing, supporting and ultimately cultivating brokerage activities, thereby accelerating innovation dissemination in healthcare networks(Gaid et al., 2021).

Methods

This exploratory case study was carried out in a Dutch nationwide inter-organizational network of 27 teaching hospitals collaborating in four well-established (lasting for at least five years) thematic networks: 'high clinical care', 'acute care', 'academic research', and 'innovation'. In each network, one or more representatives from every hospital are participating. This study concentrated on one network aimed at facilitating, and scaling technological, social, service, and/or process innovations to enhance the quality and safety of care. The five broker roles of Gould and Fernandez (1989)serve as our conceptual lens to understand how individuals facilitate knowledge exchange and innovation dissemination across organizational boundaries. By using both structural and behavioral aspects in their typology. This allows us to differentiate between different broker roles within the network and to examine the distinct activities they enact in each role.

Data collection

Empirical data included 10 hours of observations at network meetings, followed by 32 semi structured interviews, and by a focus group. The observations provided us with an understanding of the interactions between the network actors and grounded the dynamics and objectives of the network in a practical context. The interviews were intended to gain a deeper understanding of whether the brokers (e.g. individuals in the network), do within the context of this healthcare network aiming to disseminate innovations and exchange knowledge. The focus group allowed us to validate our initial findings and adjust or deepen them. Ethical approval was secured from the Ethics Review Board of Tilburg University (Reference: TSB_RP741) before study commencement. Data storage is compliant with the GDPR. The study adheres to the COREQ checklist (Appendix A).

All participants were informed prior to the start of the study and provided consent for the observations, the interviews and focus group. Following the participants' written consent, we conducted semi-structured interviews with at least one representative from each participating hospital (n=32). Based on a literature search and our observation analysis, we created a topic list

including topics like adoption(Aunger et al., 2022; Greenhalgh & Papoutsi, 2019), knowledge exchange, and diffusion of practices within the network, and brokerage activities (Gould & Fernandez, 1989; Neal et al., 2015) (see Appendix B). The interviews were conducted online (MR), using Microsoft Teams, and transcription commenced immediately. Transcripts were reviewed for accuracy, with adjustments focused on typographical corrections rather than alterations to the content of the responses. Pseudonymization of the data followed transcription, excluding respondent names, hospital references, and other affiliations. Video files were securely deleted after transcription.

Data analysis

The pseudonymized transcripts and thick descriptions were analyzed using reflexive thematic analysis, following Braun and Clarke (Braun & Clarke, 2006; Byrne, 2022)supported by the Atlas.ti software. One researcher (MR) established familiarity with the data through repeated reading and initial scanning (Riessman, 2002). Two researchers (MR en AMW) independently conducted the in-depth analysis, involving coding and theme generation of five transcripts. All the researchers discussed the coding schemes up to consensus, and in the next phase, one researcher (MR) coded all the transcripts beyond surface semantics, applying latent-level coding to identify the underlying assumptions and concepts. The analysis proceeded in two phases. First, a deductive approach was used to identify and analyze the activities associated with each of the broker roles. Each broker role was depicted to capture its distinct activities, interactions and knowledge exchange. This coding step was verified by a research assistant and was followed by minor adjustments. Second, following an inductive approach, the capabilities needed to enact the brokering activities emerged from the date (see Appendix B for an overview of the data analysis per broker type, illustrating the activities and corresponding competences).

Following coding at the latent level, we validated our findings through a focus group session (N=22) to discuss our findings and gain more in-depth information(Birt et al., 2016). During this session, participants self-assessed which brokerage roles they most frequently enacted (see Appendix C), followed by a discussion of the extent to which they recognized and related to the different roles.

Results

Guided by the five formulated broker roles (Gould & Fernandez, 1989), we organized our findings according to these roles. We found that each role captures a particular aspect of brokerage in the network, and we enriched them by identifying role-specific tasks and illustrating how the different brokers undertake these activities. These roles are not always bound to a single person, as professionals may simultaneously enact multiple broker roles, and several people can execute tasks of a particular broker role. We found no evidence that the broker roles are confined to any single profession or a specific background; they may be taken up by healthcare professionals, advisers, department managers, or board members.

The coordinator role and its activities

According to Gould and Fernandez (1989), the main activity of the broker coordinator role is to connect employees from different departments of their organization to work on the topic of innovation. Our respondents described this role in the same manner. Multiple respondents mentioned the importance of organizing events to generate innovative ideas within the organization, share these ideas, and foster new collaborations that support the innovation process from an early idea onwards to embedding it in practice. The coordinator acts as an ambassador to promote innovation among staff. The importance of this role is shown in the quote below.

> *[We have] an ambassador on the ward, who addressed this problem. Someone who embraced this [the innovation] and motivated the team to adopt it. It's part of the social innovation that is essential to make the implementation of an innovation succeed. On another ward, you don't get the same spirit and people will easily resist [adopting the innovation]. So, we need these ambassadors. (R2)*

Other core tasks include providing advice, services, or knowledge on innovation methodology. In the pilot phase of an innovation project, the coordinator advises on methods to develop an innovation and provides an overview of who needs to be involved for which purpose at which moment (i.e., stakeholder management). The coordinator also supports practicalities during the innovation process, such as obtaining funding for the innovation. For top management, the coordinator assists in drafting the innovation strategy. To fulfill these activities within the organization, respondents emphasized the importance of communication skills, which help

reduce resistance to change and motivate staff to adopt and embed innovations. In addition, the coordinator needs an understanding of the organizational culture to navigate dynamics and tailor their approach accordingly. As one respondent explained:

> *Working with nurses is very different; their focus is naturally on patient care, engaging them [with the innovation], therefore, it requires a different approach. We have to explain to them the importance of this innovation. But in the end, whether it is a product, an app or a different way of working, innovation always comes down to people. (R2)*

This quote highlights the cultural awareness and adaptability that are required. When supporting staff on their innovative projects, specific knowledge of research methods and the ability to prepare business cases were helpful. For providing strategic support, an awareness of the available resources and ongoing innovative initiatives was considered relevant

The gatekeeper role and its activities

The gatekeeper is responsible for acquiring knowledge on innovations from outside their organization and passing this information on to actors within their organization(Gould & Fernandez, 1989). According to our respondents, the gatekeeper acquires outside knowledge at social events (e.g., conferences, network affiliations) or via social media (e.g., WhatsApp, LinkedIn). They are inspired by colleagues working in other hospitals and through conversations with private commercial companies offering innovations. Assessing new information and innovations is an essential task in the gatekeeper's role. They assess the relevance of information for their organization (e.g., applicability, usability, feasibility). When determining whether an innovation is suitable for adoption and implementation, some organizations use formal criteria, whereas others have a steering group to assess innovations. The respondents mentioned the importance of receiving certain information (e.g., business cases or research outcomes) from other organizations, as this helps them present an innovation and convince others to adopt it. In particular, gaining practical insights, the do's and don'ts, of the implementation process from other organizations is seen as highly valuable, as it helps prevent reinventing the wheel and accelerates the innovation process. The following quote shows the perceived benefit of using the experience of other organizations:

> *If another hospital has already put effort into designing and implementing [the intervention], and we haven't, it's definitely useful to swap knowledge so we don't have to reinvent the wheel, which only costs time, money, and personnel. When we can use other people's knowledge, that's a big advantage. (R52)*

To acquire and assess innovations, respondents mentioned that strong networking skills, specific expertise, and intra-organizational communications skills are relevant to identify external information, evaluating the fit by comparing organizational contexts, and ensure the appropriate individuals within their own organization. The following quote illustrates both the awareness required to stay informed about developments and the contextual knowledge needed to assess the feasibility of adopting an innovation.

> *It is already challenging to map all the ongoing innovation projects within our own organization, let alone to know what happens across the country, or even Europe. ".." In an ideal scenario we would adopt a promising innovation, for instance when we have similarities in ICT structure, but in reality, the annual schedule is already packed with projects. Implementing a new innovation requires substantial time [in this example] for the ICT department but also from other staff. That is why we have become more critical when we see a promising innovation. (R31)*

The representative role and its activities

In contrast to the gatekeeper working 'outside-in', the representative works 'inside-out'. The main task of the representative is to share their organization's knowledge and innovations with actors in other organizations. The following quote highlights the representative's activity to share their learnings with peers.

> *For example, with [specific innovation] we were one of the first in the Netherlands to implement it. Many hospitals came to observe, and they have since adopted similar systems. Within our network collaboration, we've given numerous sessions, and people have definitely copied the way we've done things.(53)*

Our data shows various approaches to sharing knowledge with external actors. Academic publishing is commonly used in the Dutch healthcare sector, to share knowledge on innovations with peers. The respondents also mentioned using social media, mainly LinkedIn, to share news

of achievements and initiatives. Some organizations have assigned their communication department to share successes (mainly online) and distribute knowledge on innovation as well.

Additionally, the individual in the representative role interacts and negotiates with a range of partners, including public institutions (e.g., academic medical centers, universities, healthcare inspectorate), other hospitals or healthcare providers in the region, as well as commercially driven companies, including larger corporations and small to medium-sized enterprises (e.g., technology firms, IT vendors, suppliers). Interacting with these external partners consists of creating new alliances to collaborate in innovation processes or continuing existing collaborations. Most of the respondents are approached by companies, and only some of them act on the offer to connect. The main reason for this behavior is the distrust regarding any commercial motives, or sometimes because of a preferred technological supplier. Respondents mention that reciprocity of exchanging knowledge and experiences makes answering questions of external actors worthwhile, even though they can be time-consuming. The following quote shows that the actions of a representative are driven by a genuine desire to improve patient care.

> *I don't think there are any incentives or benefits at all [in sharing knowledge with each other]. When I see the potential [of an innovation] for multiple factors, including patient care, I would share it with others, only on intrinsic motivation, with the knowledge that others will adopt this new way of working. But apart from that, there is no incentive at all.(R9)*

> *When I am a frontrunner with something, I enjoy sharing it. I think people generally like sharing things too. It's not about our hospital, it's about ensuring that patient care, in general is well organized. I assume most people feel the same way. That said, offering something in return could actually be effective, as it might encourage people to participate more actively. (R31)*

In the second quote, "intrinsic motivation" is mentioned, a concept frequently used by our respondents when discussing the representative role. This suggests that these activities are often informal and not explicitly outlined in job descriptions. Tasks like sharing knowledge and advising colleagues in other organizations are driven by individuals' willingness to contribute beyond formal duties, reflecting their voluntary commitment to the success of the innovation

network. According to respondents, this knowledge-sharing role requires a humble approach and the ability to provide thoughtful advice to others.

The liaison role and its activities

The brokerage activity in a liaison role is mainly being a bridge between actors that may otherwise have limited or no direct access to each other's innovation knowledge(Gould & Fernandez, 1989). The liaison, is described by our respondents as a third party that connects people, and transfers knowledge between two actors from distinct organizations (see Figure 1). Additionally, the liaison role serves as a connector by facilitating and fostering communication between actors. Multiple respondents mentioned delegates from healthcare insurance companies as an example in the Dutch context, acting as a third party by gathering knowledge on innovations from different organizations and spreading it to others.

> *Our biggest healthcare insurance company gathers innovations and good practices. They collect innovations and transform it into an infographic, for instance, and then spread it among their healthcare organizations.(R9)*

As the quote shows, these liaison roles possess the ability to interpret contextual nuances and translate specific knowledge into a broadly usable format. Employees in these organizations can act as liaisons, as their broad connections within the network enable them to identify frontrunners and they can recognize similarities in innovation processes across organizations. Through that, they can determine which actors may benefit from each other's support.

The cosmopolitan role and its activities

The broker activity in a cosmopolitan role serves as a connector of actors within the same organization, while not being part of this organization(Gould & Fernandez, 1989). Such connections are particularly valuable when individuals or teams from different disciplines work on related or the same projects. According to respondents, this role facilitates communication and collaboration from distinct domains (e.g., healthcare professionals with the IT department). In a Dutch cross-sector alliance with both public and private commercial partners, delegates from a private commercial company were mentioned acting as a project manager and serving to connect employees. Similarly, consultants and the staff from the supporting unit of the overarching organization of all hospitals, were mentioned as fulfilling the cosmopolitan role in

the Dutch context. In order to do so, the cosmopolitan must be able to identify the relevant actors, communicate effectively with different groups, and navigate different professional languages, for example, translating between technical (e.g., IT) and clinical (e.g., medical terminology) domains.

Discussion

While healthcare networks, as inter-organizational collaborations, are recognized as a 'vehicle' for knowledge exchange and innovation dissemination (Leis, 2025; Lennox et al., 2022), empirical insight into how this dissemination is enacted by actors collaborating in these networks, acting as brokers, remained limited. As outlined in the introduction, brokers can be studied structurally, by examining the brokers' position in a network or behaviorally, by examining the activities enacted by the broker. Much of the existing literature has emphasized either the structural or behavioral aspects, often treating these perspectives in isolation. Consequently, leaving the other perspective overlooked. Building on the typology of Gould and Fernandez(1989), this chapter advances knowledge on brokerage in healthcare networks by integrating the structural perspective of the five different broker roles and the behavioral perspective by examining the distinct activities of each role in a healthcare network and how these activities contribute to innovation dissemination. Furthermore, the capabilities required to enact the brokerage activities emerged from data synthesis, thereby illuminating not only what brokers do, but what enables them to do it well.

Activities

Previous research has predominantly conceptualized brokerage behavior in generic sets of activities. Brokers are frequently described as facilitating the flow of information and expertise(Kislov et al., 2016), or their activities are categorized into 1)'information management', involving the sharing of knowledge and the provision of expertise. 2)'linkage and exchange', fostering connections between people and contextualizing knowledge for different stakeholders, and 3)'facilitation', encompassing the translation of knowledge into action(Turnhout et al., 2013; Ward et al., 2009). Some have also included a fourth activity category, coordination, involving the orchestration of collaboration and alignment among network participants(Brown & Duguid, 1991; Wenger, 1998). Our findings show that the different broker roles enact specific activities and that brokerage in this context cannot be seen as

a generic set of activities nor can they be understood detached from their structural position. Our primary contribution lies in specifying the distinct activities associated with each of the five broker roles within healthcare networks (Gould & Fernandez, 1989). These activities are manifestations of brokerage behavior which is what they *do* within healthcare networks to facilitate innovation dissemination (Bornbaum et al., 2015) and are also shaped by their position and context in which they operate. For example, coordinators may act as ambassadors who actively promote an innovation within their organization, whereas gatekeepers assess the usability and relevance of an innovation before introducing them internally. Although these roles both fall under the concept of brokerage, they require analytical and practical differentiation. The implications for practice are threefold. First, as brokerage in healthcare networks often occurs implicitly(Kislov et al., 2016), making the different broker roles explicit can legitimize the activities. Formalization can occur in the form of job descriptions or designated positions(Crowley, 2014; Knight et al., 2020) Second, recognizing that broker roles differ in their activities underscores the need for brokers to tailor their broker approaches to the specific audiences they engage with(Van der Graaf et al., 2019). Third, organizations should avoid assigning brokerage responsibilities to a single designated individual. Rather, brokerage behavior should be understood as a process operating through configurations of brokers in which broker roles are complementary and collectively contribute to the dissemination of an innovation within the network(Van der Ven et al., 2025; Waring et al., 2013, p. 85).

Competences

A tentative second contribution suggests that different broker roles in healthcare networks aimed at disseminating innovations require a distinct set of competences to fulfill their broker activities (Cannavacciuolo et al., 2015). These competences include communication and networking skills, as well as context-specific expertise, such as the ability to navigate organizational and professional boundaries. While social skills are the foundation for all broker roles, (Kislov et al., 2017; Ward et al., 2009), and may therefore be regarded as generic skill set for brokerage, our findings show that the emphasis of these competencies varies across roles. In other words, just as the brokering activities differ for each broker role, the way in which competencies are needed also depends on each role. For instance, the *coordinators* rely on social skills to motivate colleagues and reduce resistance to change, whereas *gatekeepers* rely on their ability to establish

external connections (e.g., social skills) and access relevant information from outside the organization. *Liaisons* and *cosmopolitans*, in turn, use their social competence to align agendas and connect actors across organizational boundaries. Acknowledging this role-specific competencies is essential for strategically identifying, positioning, or training individuals within healthcare networks (Ward et al., 2009).

Having established that different broker roles are associated with distinct activities and therefore require different or multiple competencies, it is necessary to further unpack what is labeled as networking skills. In the context of innovations dissemination, networking skills extend beyond interpersonal communication or relationship building. It encompasses the ability to acquire, assess, translate, and mobilize knowledge across organizational and professional boundaries. Moreover, the understanding of individuals of "who knows what" within the network is foundational for the development of a transactive memory system in the network(Argote & Guo, 2016; Borgatti & Foster, 2003). A transactive memory system is a shared understanding of the distribution of expertise across individuals in the network. Such a system enhances the networks capacity to efficiently distribute specialized knowledge, coordinate actions and transfer innovations. By acknowledging both the different competencies required for the five broker roles and broader benefits of networking skills of individuals, this chapter also shows how competences of individual brokers can contribute to the collective capacity of the network. Developing and facilitating these competencies, through training, may thus strengthen the networks' ability to disseminate innovations effectively(Cannavacciuolo et al., 2015).

Conclusion

Healthcare networks as inter-organizational collaboration hold significant potential to facilitate the dissemination of innovative practices across organizational boundaries. This study contributes to a deeper understanding of how actors, as brokers, collaborate within a healthcare network aiming to disseminate innovations. Drawing on Gould and Fernandez' foundational typology, we empirically examined how different broker roles are enacted in the context of innovation dissemination in healthcare. Our findings show that each broker role, with a specific structural position in the network, contributes to innovation dissemination through distinct brokerage activities. Consequently, distinct activities require different competences to fulfill their broker roles in the network. By highlighting the behavioral and structural nature of different

broker roles, we provide insights to brokerage processes in healthcare networks. The differences in activities and competencies should be acknowledged to maximize the capacity of the network to disseminate innovations across organizations.

Limitations

While the empirical approach enabled an in-depth exploration of brokerage behavior and the validation of our configurations are strengths to this study, this study also has several limitations. First, the study focused on inter-organizational collaboration, which limited the exploration of intra-organizational processes that are also important in innovation activities(Obstfeld, 2016). Future research could benefit from a multi-level perspective, examining both inter- and intra-organizational processes. Second, the specific competences were not explicitly included in the study's initial scope but emerged inductively during data analysis. Although the identified competences align with established competency frameworks(Podmetina et al., 2018), and were confirmed during data validation, this inductive emergence limits the depths with which competences were explored and warrants further research. Third, the findings reflect a context-specific understanding of brokerage behavior in Dutch healthcare networks aimed at innovation dissemination. While the combined perspective on structural position and behavioral aspects of brokers provides a useful lens for studying actors as broker roles, contextual factors influence how brokerage manifests. Researchers should therefore remain attentive to the context dependency of these findings.

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"Care to collab?"

A serious game to experience brokerage behavior in healthcare networks

Chapter 5

"Care to collab?" A serious game to experience brokerage behavior in healthcare networks

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Ethical Approval

Ethical approval was secured from the Ethics Review Board of Tilburg University (Reference: TSB_RP741).

Abstract

Background: Inter-organizational collaboration has become crucial in healthcare as complex challenges require coordinated efforts across organizational boundaries. Individuals, acting as brokers, play a pivotal role in bridging organizational boundaries by coordinating, transferring and translating knowledge across organizations. However, these brokers are often unaware of the different broker roles they enact, limiting their ability to collaborate effectively.

Intervention: We developed a serious game to help healthcare professionals and managers recognize and experience brokerage behavior within a simulated healthcare network. This paper describes the design and the initial insights from playing the game in practice.

Method: We formulated learning objectives and a game based on multiple 'open triads' as network structure to encourage players to engage in different brokerage roles, described by Gould and Fernandez. The serious game development was followed by a series of try-outs including reflection sessions in which players reflected on the experienced collaboration efforts and brokering behavior.

Results: Gameplay lasted 15-25 minutes, during which players engaged in different forms of brokerage behavior. As the game progresses, players employed different brokering strategies to overcome barriers and work collaboratively towards common goals. As designed, several tensions emerged when players experienced conflicting goals or forms of (competitive) network dynamics. Subsequent reflection sessions deepened the understanding of how individual and collective goals shape brokering behavior and vice versa, and how this can influence inter-organizational collaboration.

Conclusion: The application of the serious game demonstrated its potential to foster game-based learning on brokerage behavior and its influence on inter-organizational collaboration. During gameplay, players enacted different brokerage roles and were also engaged in broader network dynamics, such as boundary spanning. Through gameplay and reflection, players recognized boundary roles and overcame typical counterproductive network behavior, such as 'siloing'.

Introduction

Inter-organizational collaboration has become increasingly important in healthcare due to growing systemic pressures – such as the increasing complexity of care deliver, the rising demand for healthcare services, workforce shortages, and financial constraints (Hefner & Nembhard, 2021; Kaats & Opheij, 2014). Consequently, contemporary healthcare delivery increasingly involves multiple specialists, diverse care settings, and coordination with non-healthcare entities (Van Klaveren et al., 2025). Effective collaboration across organizational and professional boundaries can avoid fragmented services and ensures care continuity and quality. Yet, in practice, network collaboration is frequently challenged by organizational boundaries. These boundaries can obstruct the flow of critical information necessary for achieving collective goals and thereby hinder the exchange of knowledge across organizations (Lunkka et al., 2022; van der Ven et al., 2025; Waring et al., 2021). Individuals in networks, such as healthcare professionals, can bridge these boundaries and play a pivotal role in cross-boundary collaboration (Kislov et al., 2016). This paper describes a serious game, developed to support this cross-boundary collaboration.

Facilitating communication and transferring knowledge across boundaries is called 'brokerage' (Halevy et al., 2019). Brokerage is also described as the act of connecting actors who would otherwise remain unconnected (Granovetter, 1973). While healthcare professionals conduct brokerage behavior daily, they are often not fully aware of their brokerage position in the network, nor are they familiar with the impact of their brokerage behavior (Knoben et al., 2018; Turnhout et al., 2013). Their limited understanding of brokerage hinders effective and efficient disseminate knowledge and coordination of collaborations, potentially contributing to fragmented care delivery. As highlighted by Williams et al. (2021) a key challenge for healthcare professionals is "to identify *who* is undertaking brokerage behavior and there is a need to understand where and when network brokering might occur, by whom and for whom"(Williams et al., 2021, p. 25).

Scholars distinguish five types of brokerage roles, each associated with distinct activities shaped by an individual's network position (Gould & Fernandez, 1989; Halevy et al., 2019; Neal et al., 2015). When all actors belong to the same organization, the *coordinator* acts locally, brokering information internally. The *gatekeeper* acquires information from another organization and shares it with actors in their organization. Conversely, the *representative* brokers information

from their organization to actors in another organization. When belonging to a different organization, the *cosmopolitan* brokers information between two actors within the same organization. The *liaison* brokers information between actors from two distinct organizations while being affiliated with a third organization. Additionally, in networks, brokerage roles emerge from structural positions that connect otherwise disconnected actors or groups. Brokers enable information flow, coordination, and translation across organizational and professional boundaries. The type of brokerage enacted depends on who is connected to whom and where the broker is positioned relative to organizational boundaries (Kirkels & Duysters, 2010). Together, these five brokerage roles shape how knowledge circulates and collaboration unfolds in inter-organizational networks.

Because healthcare professionals engage in brokerage behavior daily, both in their organizations and across organizations, in formal and informal networks, it is essential to recognize and understand the different types of broker roles. Especially relevant since they may exhibit multiple broker roles depending on the context (Brass, 2009). For example, a healthcare professional participating in a network meeting might act as a gatekeeper by gathering information, simultaneously acting as a representative by disseminating knowledge, or as a liaison by facilitating communication between organizations. Unawareness of the different broker roles might trigger challenging behavior that undermines collaboration (Melo & Bishop, 2020; Pedersen et al., 2024), such as (I) an inward orientation, also known as 'siloing', in which the broker remains stuck in the internal *coordinator* role, limiting its willingness to collaborate across organizational boundaries(Bento et al., 2020); (II) a non-reciprocal orientation, in which the broker solely engages as a *gatekeeper* to gain information or resources from partners without contributing in return(Swärd, 2016); and (III) inside-out framing, in which the broker, acting as a representative, shares information solely from the senders' perspective, failing to translate insights to the partner's context (Williams et al., 2021). Hence, awareness and understanding of these varying roles and the corresponding activities are essential for fostering effective brokerage behavior that supports collaboration.

Experiencing the different brokerage roles and associated behaviors can equip professionals with insights and supports the competence development needed for effective and efficient collaboration across organizational boundaries (Argote & Guo, 2016; Wegner et al., 2022). Thus, understanding brokerage roles and activities is essential for brokerage and the prevention of

collaboration-hindering practices. One way to foster such experiential understanding is through serious games, which offer a promising approach for enabling professionals to engage with the diverse activities associated with brokerage behavior within a safe learning environment. Serious games, as an educational tool, aim to create interactive learning environment in which learners actively shape their learning process(Rutledge et al., 2018). These games have proven effective in enhancing management and decision-making skills among participants (Alshehhi et al., 2024; Collignon & Sana, 2020; Hauge et al., 2012; López et al., 2021). Beyond general skill development, serious games have been demonstrated to be valuable to foster a deeper understanding of complex constructs such as social network structures, social capital, and organizational change processes (Carreira et al., 2017; Trefalt, 2014). The reason for this is that serious gaming enables engagement in real-life scenarios, offering an experiential learning through which individuals acquire knowledge, skills and values via direct experience and reflection rather than through passive reading or listening. This experiential learning is particularly well-suited for developing behavioral understanding and for cultivating social competencies (Bonesso et al., 2015; Olejniczak et al., 2020).

Building on evidence on serious games and the importance of enhancing effective inter-organizational collaboration through healthcare professionals' brokerage behavior, we developed a serious game to provide healthcare professionals with experiential learning on brokerage behavior. The game illustrates and enables players to understand how brokerage behavior influences the dissemination, translation, and transformation of knowledge (Grosser et al., 2019; Kwon et al., 2020; Obstfeld, 2016; Williams et al., 2021). Additionally, the game should serve as a reflection tool, enabling players to reflect on how they collaborate in their current healthcare networks. This paper outlines the design of the game and presents the first experiences and observations from practice.

Methods

This study aims to familiarize healthcare professionals with brokerage behavior using a serious game simulating inter-organizational healthcare collaboration. Ethical approval was secured from the Ethics Review Board of Tilburg University (Reference: TSB_RP741). To ensure the serious game effectively facilitated experiential learning, we started by formulating learning objectives using Bloom's taxonomy (e.g., remember–understand–apply–analyze–evaluate–reflect) covering multiple levels of cognitive engagement (Bloom et al., 1964).

1) Players understand how inter-organizational boundaries hinder collaboration in healthcare networks. They learn to apply strategies to bridge these boundaries and reflect on how such barriers manifest in their own contexts.
2) Players understand the concept of brokerage behavior and can differentiate between the five distinct brokerage roles and their associated activities. They learn to identify the required competencies to effectively enact each role.
3) Players apply brokerage theories to analyze their own professional networks, evaluating when and where brokerage behavior occurs. They reflect on how their own behavior facilitates or hinders collaboration.
4) Drawing on insights gained through gameplay and reflection, players are able to optimize their brokerage behavior to support more effective collaboration in their own networks

These learning objectives outline the intended aim of the serious game and guided the subsequent design process. In the following section, we outline the design steps through which these objectives were translated into the game's structure. The serious game development was guided by the 'simulations and gaming' principles of Van de Westelaken and Peters (Van De Westelaken & Peters, 2011). The process of developing a game simulation can be divided into three main phases.

1) The system analysis phase involves constructing a detailed representation of the setting, including the actors, relevant contextual factors, and their interrelationships, resulting in an overview that informs the formulation of gaming elements. We conducted a targeted literature search on brokerage behavior within inter-organizational networks to identify theoretical components to be translated into gaming elements. Drawing on Williams (2021), we integrated brokerage as a process

of transferring, translating and transforming knowledge across domain x. For coordination challenges, inherent to multi-actor networks, we build on classic conceptualizations of Burt (2005), Gould and Fernandez (1989) and Kislov (2017) but also incorporated more recent studies of brokers as relational actors with broker activities, broker skills and brokers as boundary spanners (Baas et al., 2023; Yamanie et al., 2023). Although power and hierarchy are features of brokerage within networks, we excluded power relations or structural dominance patterns in this game (Obstfeld, 2014; Trefalt, 2014).

2) During the design phase, we selected system components and translated them into gaming elements. Additionally, determining how and to what extent each element will be incorporated into the simulation.

3) Finally, in the development phase, these components were elaborated into scenarios, roles, and character functions. We tested and refined the game iteratively through staged tests.

Following gameplay, the debrief and reflection session constitute a critical learning component. The reflection session is intended to let players actively relate in-game experiences to their daily practice and to bridge the gap between theoretical boundary behavior concepts and real-world application, reinforcing the learning experience, which is in line with the ultimate learning objectives (Carreira et al., 2017; Kolb, 2014; Peters & Vissers, 2004).

Data collection, analysis, and iterations

We tested the serious game in various settings to examine user engagement and evaluate whether it met the predefined learning objectives. Participants were recruited through convenient sampling and included healthcare managers, network coordinators, professionals, students, and scholars at academic conferences. We purposively sampled a range of different testing environments, from small, focused workshops (n=6; the game's minimum group size) to larger-scale demonstrations during academic conferences (n=82), where multiple games were played simultaneously. To evaluate the usability of the game and the perceived attainment of the learning objectives, we tested the game using by an open questions questionnaire. This questionnaire was administered at a key point in the development process to capture players' experiences. This was complemented by qualitative insights gathered through facilitators' field

notes and thick descriptions of direct observations. All data was thematically analyzed using in a reflective stance the five steps of Braun and Clarke (Byrne, 2022).

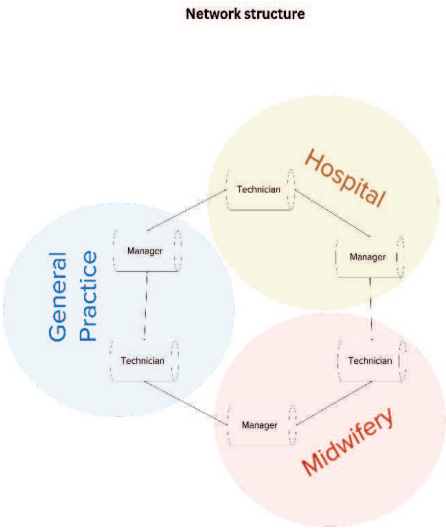
Results

This section describes 1) the serious game development and 2) observed brokerage behavior during gameplay and 3) emerging themes from the reflection sessions.

Game development

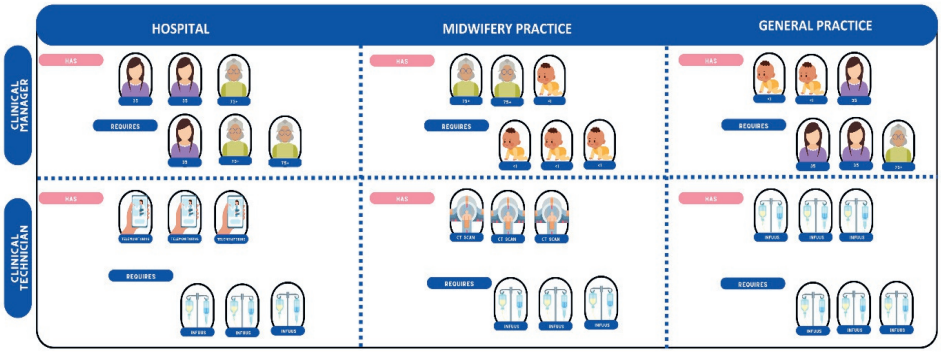
Serious game development started with a system analysis including actors and contextual factors. To integrate inter-organizational brokerage behavior, we started with the context of a regional healthcare network and the aim that players must collaborate across organizational boundaries. This led to the narrative for the game scenario: *there is a looming crisis in which both patients and medical equipment are misallocated. Only through inter-organizational collaboration players can coordinate the appropriate redistribution of patient and equipment cards*. Next, we designed a network structure that would encourage interaction between at least three 'organizations'(Provan & Kenis, 2007), for the game scenario we chose for a *hospital*, a *midwifery practice*, and a *general practice*. Brokerage, in its most basic form, involves bridging gaps by connecting actors who are otherwise unconnected, often referred to as an 'open triad' (Granovetter, 1973). To stimulate bridging behavior, as articulated in learning objective 1, we designed a network structure with multiple open triads, creating configurations in which not all actors are directly connected. In the game each of the three organizations had a *clinical manager* and a *clinical technician*. This resulted in a minimum of six players, which were not allowed to communicate with everyone (see Figure 1).

Figure 1. *Network structure; Circles represent organizational boundaries, and arrows indicate communication pathways.*



To stimulate collaboration across organizational boundaries in the game and to promote knowledge transfer, each player was assigned with an individual goal, such as collecting a set of specific patient cards (e.g., three elderly patients). The cards necessary to complete individual goals were deliberately distributed among other players with whom direct communication was restricted. Thereby nudging collaboration between players. Figure 2. Illustrates the initial distribution of cards across players ("has") and the corresponding individual goals ("required").

Figure 2. *Card distribution at start of the game ("has"). Including the individuals goals on their character cards ("required").*



The combination of the network structure, the communication constraints and individual goals, place every player in a distinct broker position. For instance, players need to negotiate on behalf of others or to act as intermediaries between disconnected actors. Next, we listed specific behavioral activities of different brokerage roles (Gould & Fernandez, 1989) and translated them into gaming elements. The players who negotiate on behalf of others act out the *gatekeeper* role, and when acting as intermediaries between disconnected actors they act out either the *cosmopolitan* or *liaison* roles. Table 1 outlines the gaming elements designed to provoke key activities of each distinct broker role.

Table 1

Gaming elements per broker role (Gould & Fernandez, 1989)

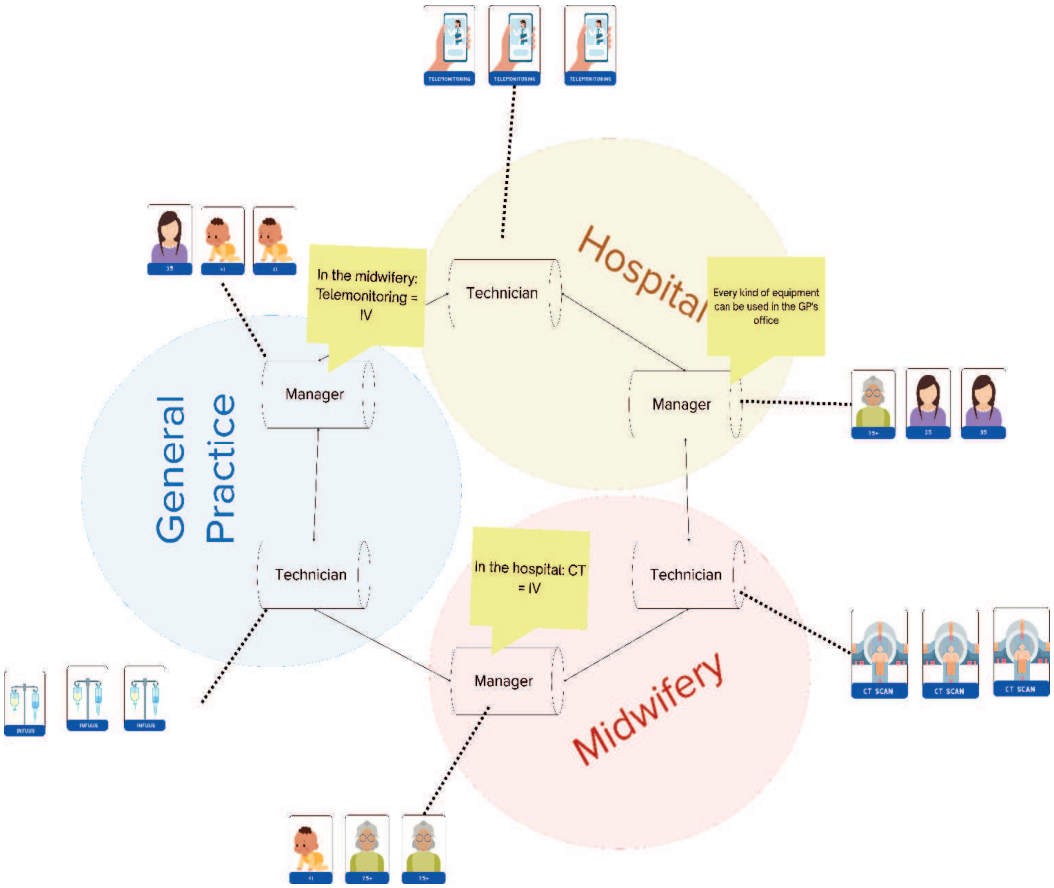
Broker role	*Activity*	*Gaming element*
Coordinator	Collaborating with intra-organizational partners	Players need to collaborate within the same organization Each players has a personal goal
Gatekeeper	Searching for information (outside in) Assessing information Transferring information	A player only completes their goal by receiving 'it' from another player Players have to communicate and transfer 'on behalf' of a colleague
Representative	Spreading information (inside-out) Negotiating with inter-organizational partners	Players start with cards they do not personally need for their goal. There is information on personal cards that they do not directly need to attain their goal

		Players have to communicate and transfer 'on behalf' of a colleague
Cosmopolitan	Coordinating inter-organizational information flow Facilitating collaboration Translating information	There is key information on cards of players that helps others to complete their goal. No power position.
Liaison	Coordinating inter-organizational information flow Translating information	There is key information on cards of players that helps others to complete their goal. Incorporating a puzzle/riddle so that placing information in a different context asks for translation of the information.

To incorporate translation skills, requiring players to adapt the meaning and application of information to different organizational contexts (van Grinsven & Heusinkveld, 2023), into the game we created a perceived shortage of an equipment card: all *clinical technicians* have the same individual goal (see Figure 2): *obtain three IV's (intravenous fluids)* each, while only three IV cards were available instead of the nine required. Information needed to translate equipment into the correct context was distributed in the instruction cards of fellow players. For example, the instruction card of the *clinical manager* at the *general practice* indicates that the alternative for *IV's* at the *midwifery practice* is by using "*telemonitoring*" instead. As a result, players need to identify their goal, acquire key information and translate this into their context to achieve their individual goal (see appendix A for the full set of instruction cards). Figure 3 shows the distribution of the key information.

To prevent game dynamics hindering information flow, such as players deliberately withholding information or cards, a neutral environment was designed, by deliberately excluding hierarchical imbalances, power dynamics (e.g., 'doctor versus 'nurse'), and competitive elements (e.g., financial incentives).

Figure 3. *Distribution of key information. The yellow labels indicate the character cards on which key information is located.*



Playing the game and observed brokerage behavior

The game set-up requires a minimum of six players and is scalable in multiples of six. Any additional players (e.g., a seventh or eighth player) assumed an observer role during gameplay.

Each player starts with a set of three cards, being patient (i.e. infant, adult, elderly) or equipment (i.e., IV, radiology, telemonitoring) cards. Figure 2 illustrates the initial setup for the card distribution and Appendix A includes all character cards with instructions. The game concludes when all players have successfully achieved their personal goal, indicating effective coordination and collaboration across their network. The duration of gameplay varied between 15-25 minutes (excluding reflection).

The game enabled players to engage in brokerage behavior and to develop an understanding of the range of activities associated with distinct brokerage roles (learning objective 2). Throughout gameplay, we observed brokerage behaviors corresponding to each of the identified broker roles. For the ***coordinator*** role, both *clinical managers* and *clinical technicians* often began by identifying their goals and initiating communication with their colleagues within the same healthcare organization (i.e., *hospital, the midwifery practice or general practice*) to align individual goals and discuss strategy. After identifying their goals and communicating with their colleague in the same healthcare organization, it did not take long to start interactions with other players from other organizations, shifting from the coordinator role to the gatekeeper role.

As for the ***gatekeeper's*** role, both *clinical managers* and *clinical technicians* began by identifying with whom they were permitted to communicate and whether these connections were relevant to reach their individual goals or their colleagues' goals. After identifying the 'right' player with relevant cards for them, players frequently engaged in active negotiations and initiated card exchanges. Negotiations were sometimes on behalf of their partner, because of the communication constraints. Negotiations, in most cases, resulted in an instantaneous exchange of cards, either because the players (e.g., the *clinical technician* at the *hospital*) holding the desired card explicitly requested "something in return right away", or because the gatekeeper (e.g., the *clinical manager* of the *general practice*) had suggested this and framed it as a "mutually beneficial transaction". As part of their negotiation strategy, some gatekeepers introduced notions of economic value: , "a CT scan is of considerable value compared to an IV", to persuade other players to card exchanges, even though economic value was not an explicit game element. These interactions illustrated how players, in their role as gatekeepers, actively facilitated card exchanges and used negotiation strategies to achieve goals, and helped their other players of the same organization, often relying on direct reciprocity by requiring something in return.

Because cards and information exchanges require both a source and a recipient, not only was the gatekeeper's role observed but also the ***representative*** role throughout the game. When receiving information, players evaluated its relevance either to themselves or to other players, all being part of one network collaboration in the scenario. Similarly, before agreeing to a card exchange, players assessed whether the card was relevant to their goals. If not, the exchange was declined, or the exchange involved cards of no (perceived) value, sometimes with the promise "to exchange a better card later".

Tensions regarding card exchange arose when the gaming element of a shortage of IVs emerged. Since all *clinical technicians* shared the same individual goal of acquiring IV cards (see Figure 3), both they and the *clinical manager* acting on their behalf simultaneously searched for and were approached by others seeking the same cards. This dynamic often shifted players into a more competitive gatekeeper role, rather than adopting a collaborative stance of a representative role. Players became increasingly hesitant, and at times unwilling, to trade or disclose IV cards they had. These tensions was eventually resolved when players possessing key information revealed that: i.e., in certain organizational contexts, alternative equipment (e.g., a CT scan) could serve the same function as an IV. Since this contextual key information was not on the *clinical technicians'* character cards, conflict resolution required a degree of trust and persuasion from other players. The following quotes show how the game sometimes resulted in frustration:

"[*The game was] Frustrating because people don't believe you.*" (player 2 at conference, August '24)

This moment prompted renewed collaboration and highlighted the importance of information translation across organizational boundaries.

The ***cosmopolitan*** and ***liaison*** brokerage roles were both actively reflected in gameplay, particularly through coordinating information and facilitating card exchanges. This brokerage behavior was essential to the game's progression, particularly during the IV equipment shortage, leading to conflicting goals and tensions among players. Because we placed the information required to solve this issue on the *clinical managers'* cards, this information needed to be passed along, as only this information reframed how equipment cards could be interpreted across organizational contexts. The identification of the key information generally occurred at a later stage during gameplay, once tensions regarding the IV shortage emerged and players struggled for

some time with the realization of conflicting goals. After this identification, the *clinical managers* explained the rationale behind the exchanges and persuaded others to act, thereby facilitating card exchange, sharing key information, and persuading players to exchange cards. A subtle distinction between the cosmopolitan and liaison could be observed in terms of whom each sought to persuade.

Another noteworthy observation was that, particularly as the game progressed and the tensions emerged, some players deviated from the communication boundaries prescribed by the rules, employing inventive workarounds to address the communication barriers and discuss the issues more efficiently. They did that to varying degrees, as some of the players began speaking aloud during interaction with other players, making their conversation accessible to all players, which enabled them to overhear information. In some cases, players openly displayed their character cards by putting the cards on the table, thereby making their character, individual goal, and holding cards visible to the entire play group. During the reflection, these players acknowledged that they intentionally disregarded the original communication rules. They emphasized that this strategy facilitated more efficient coordination, as it allowed them to clearly identify how to organize card exchanges and recognize the goals of the *clinical technicians*, making it evident that a collective effort was needed to address the problem of IV shortage and to ultimately 'solve' the scenario. This transparency facilitated the coordination of cards, ultimately contributing to the game's successful completion.

Reflection sessions and emerging themes

The serious game and subsequent reflection session served as a tool to discuss current collaboration practices (ultimately learning objectives) and how their behavior hinders or facilitates knowledge exchange within their healthcare networks (learning objective 3).

"[the game was] Fun and chaotic and fostered communication and quick decision making" (player 1 at conference, August '24)

During the reflection session, players first discussed how they performed in the game and what factors contributed to successful completion. This discussion transitioned into a comparison with experiences from daily practice. The central theme that emerged was the tension between individual and collective goal attainment. Players observed that in the game, some participants

disengaged after reaching their own goal, still unaware that they held key information on their cards essential for others to succeed. This lack of awareness was attributed to limited knowledge of other players' goals, and as a result, these players did not recognize their continued role in helping the group. This game experience was seen as mirroring everyday contexts where individuals may unintentionally obstruct collaboration by focusing solely on their individual or organizational goals instead of the network goals. Additionally, the tensions arising from conflicting goals (e.g., all *clinical technicians* pursuing IVs as an individual goal) and mutual mistrust hindered game completion, as players were reluctant to hand over their IV cards. Coordination of the card exchange improved when both individual goals and collective goals were explicitly identified and communicated. Either through the cosmopolitan and liaison roles players took upon them, or due to deviating from the rules (e.g., laying the cards open on the table, talking loudly). This transparency helped to build trust, particularly among those holding IV cards, and enabled more efficient coordination of the cards. This process of 'puzzling it together' was recognized in daily practice and players highlighted the importance of understanding others' goals to achieve the collective goal. This constant awareness about 'who am I interacting with, why and what is my role in this interaction' and 'what is their goal and connection to me' was a very valuable reflection element. The following quote shows how the game raised awareness of the need to identify individual goals and to be aware of which role you take on:

"*What do I want to get from someone and what do I have to give this person*" (session with healthcare managers, May 30th 2024).

Iterations

Based on the participant feedback expressed in the questionnaire and our observations and reflections during gameplay, several iterations were made to improve clarity and engagement. One important revision involved refining the formulation of the scenario and individual goal, including the critical information required for successful game completion. In the initial version, these elements were embedded in a dense narrative text on top of the card, which hindered players' ability to identify their individual goal. By describing this information in a separate text on the bottom of the card, more emphasis was put on this key information. Moreover, we encountered some challenges in selecting neutral terminology to encourage knowledge sharing

without explicitly directing player behavior. Although we aimed to avoid overly transactional language (e.g., "exchange" or "trade"), some degree of implicit reciprocity proved unavoidable due to the nature of the gameplay. See Appendix B for the iterations of the game.

Discussion

Given that many healthcare professionals engage in brokerage roles without recognizing them (Kislov et al., 2016), this serious game offers an engaging environment to experience their brokage activities and to reflect on their implications for practice. This study aimed to familiarize players with disseminating and translating knowledge and to consider when brokering occurs, what role they take on in inter-organizational interactions, with whom they interact, and for whose benefit (Argote & Guo, 2016; van der Ven et al., 2025; Williams et al., 2021). This serious game, together with collective reflection, enabled players to understand how brokerage behavior affects inter-organizational collaboration. Initial testing cycles showed that successful game completion depended on several dynamics, including how quickly players identified and shared key information, the level of trust established among them, and the extent to which they adhered to the game's rules. Complementing gameplay, the reflection sessions encouraged participants to connect these experiential insights to their own professional practice, fostering greater awareness of their current brokerage behavior within networks. By combining experiential learning with guided reflection, the game enabled bridging the theory-to-practice gap for brokerage behavior in healthcare networks (Collignon & Sana, 2020). This makes the game particularly relevant for training professionals who work in inter-organizational collaborations.

Network theories

While the design of the serious game primarily drew on brokerage theories, including the conceptualization of five distinct brokerage roles (Gould & Fernandez, 1989), and associated activities (Turnhout et al., 2013), and required competencies (Neal et al., 2015), a particularly encouraging outcome of the observations and reflection was that players engaged in a broader range of collaborative brokerage behavior. For example, players began reaching out to others early in the game, activating the gatekeeper role as they tried to obtain information across organizational boundaries. This suggests that the initial focus on the own organization transitioned rather quickly into an 'outward orientation' (de Jong et al., 2023). This is noteworthy, as inward orientation is a well-documented tendency in inter-organizational

collaboration and often limits the achievement of network goals (Cremers et al., 2024). In playing this serious game, the players appeared to overcome this tendency rapidly. This outward orientation enabled more effective coordination and progress toward collective aims. Such behavior aligns with prior research showing that gameplay enables participants to observe, reflect on, and adapt their behavior, shifting from pursuing individual to collective goals (Gao et al., 2024). Players themselves reinforced this during reflection, where they noted that their effective collaboration began with clear identification of their goals, followed by an effort to understand other players' goals, and ultimately the strategy development that allowed all parties to achieve their goals. These steps are similar to the identification, reflection, and coordination mechanisms known to support boundary crossing (Akkerman & Bakker, 2011; Bakker & Akkerman, 2019).

Overcoming tensions

Although the game was intentionally designed to minimize competitive dynamics by excluding hierarchical elements, economic values, and power positions, several tensions still emerged during gameplay. One of the first tensions that arose was when some players achieved their individual goals early in the game, which at times reduced their motivation to continue contributing to the goals of other players. Yet, the successful completion of the game required ongoing participation. These players had to be convinced to not only achieve their own goal. This illustrates that even without explicit competition, and despite having a shared goal as part of the scenario to be played, individuals may still prioritize their goals (e.g., being the first to achieve the goal) over collective outcomes. Such subtle competitiveness can undermine collaboration and reduce individuals' willingness to continue contributing. This observation aligns with prior research showing that competitive behavior can be present even when goals are fully compatible (Hafenbrädl & Woike, 2015). A second tension emerged when a perceived shortage of cards led to the impression that individual goals were in direct conflict. In this situation, players often withheld resources unless they could receive cards immediately in return. Out of fear of losing valuable cards, players exhibited this competitive behavior at the expense of collective interest. Similarly, the inside-out framing behavior became visible when players evaluated information or cards solely from their own perspective, rather than considering their potential value for others. Notably, although these challenging behaviors were present and

initially hindered collective progress, players ultimately overcame them through mechanisms of trust and communication. For example, when the players who lacked key information (e.g., the *clinical technicians*) had to rely on the information and guidance of others regarding how the cards should be exchanged. This required trust, not only in the knowledge but also in the intentions of the other players. Trust was fostered through transparent communication about individual goals and, in some cases, by placing the cards face-up on the table. Although in real-world collaboration such openness is often more difficult to achieve, in the context of the serious game, this proved to be an effective strategy for making collective goals explicit and discussing strategy. When players made their goals and intentions visible, they were perceived as more trustworthy by others, thereby increasing the willingness of fellow players to hand over valuable cards. This interplay between trust and communication in these interactions reflects well-established enablers of knowledge sharing (Aunger et al., 2022; Borgatti & Cross, 2003; Burt, 2000; Greenhalgh, 2004; Long et al., 2013; Meijer, 2009). More broadly, building trust is widely recognized as a critical prerequisite for initiating and sustaining effective collaboration in networks (Long et al., 2013; Peeters et al., 2023a, 2023b; Shin et al., 2020) and has previously been identified as a challenge inherent to brokering (Kislov et al., 2017). Through gameplay, players experienced that knowledge exchange is not purely structural or transactional but mostly relational, shaped by perceived intentions, building trust by transparent communication, and shared goal attainment.

Limitations

We employed a systematic design process to develop game elements grounded in brokerage theory, resulting in a well-functioning and engaging serious game (Peters & Vissers, 2004; Van De Westelaken & Peters, 2011). As with any serious game, certain real-world complexities were deliberately abstracted to create a playable and focused learning experience. While the game effectively incorporates key concepts related to brokerage behavior, it does not address all aspects of real-world collaboration. For example, power dynamics, such as hierarchical structures or authority imbalances, were deliberately excluded from the game design to prevent these factors from overshadowing the three learning objectives. Nevertheless, because power asymmetries are often deeply intertwined with brokerage processes, especially in healthcare

networks, this aspect may warrant separate attention (Burt, 2013; Kwon et al., 2020; Obstfeld, 2016). Game instructors could consider addressing this topic during the reflection.

Additionally, the game was developed as a tool for experiential learning, containing four stages: engaging in an experience, reflecting on that experience, conceptualizing new insights based on the reflection, and ultimately applying those insights in real-world practice (Bonesso et al., 2015; Kolb, 2014). While the game effectively facilitated the first three stages, we did not collect data on whether players applied their acquired understanding to daily practice. Additionally, no pre- and post-intervention measurements were conducted to assess changes in knowledge, attitudes, or behavior, an important area for future research. Also, an opportunity for future research could be to play a second round, allowing players to apply new strategies (Kolb & Kolb, 2009)

Conclusion

Although healthcare professionals engage in brokerage behavior daily, many lack a clear understanding of the theoretical foundations and the range of activities associated with this behavior. The developed serious game offers an engaging way for healthcare professionals to experience brokerage behavior, such as knowledge transfer, translation, and information coordination. Beyond experiential learning, the game also functions as a reflection tool, allowing players to assess their behavior and discuss mechanisms that facilitate or hinder collaboration within inter-organizational networks they are part of. Importantly, gameplay revealed that players not only conducted brokerage behavior but also used other collaborative approaches, linked to boundary spanning, in achieving all goals and ultimately the goals of the serious game. Additionally, players showed that through gameplay, challenging behaviors that undermine collaboration, including competitiveness and inside-out framing, were overcome, and the central role of transparent communication in fostering trust became evident.

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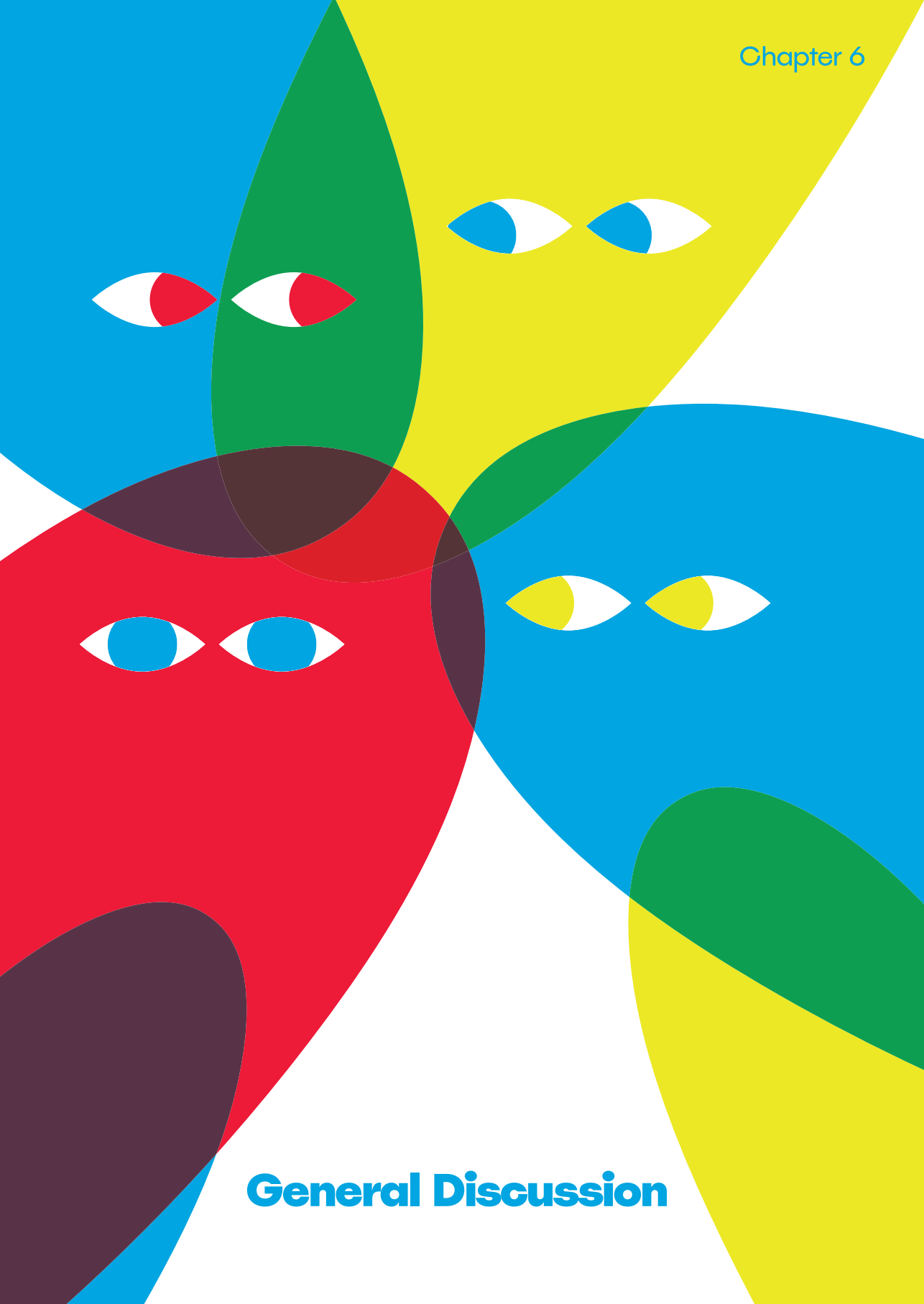
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Chapter 6



General Discussion

Chapter 6 Discussion

In response to growing challenges, such as increasing healthcare demand, rising expenditures, and persistent workforce shortages, there are strong pressures to rethink how healthcare is organized, financed, and delivered (Doebbeling & Flanagan, 2011; Hefner & Nembhard, 2021). The Dutch government considers healthcare transformation imperative, recognizing that improvements in efficiency or effectiveness alone will be insufficient(Zorgakkoord, 2022). Achieving transformation at the national level extends beyond redesigning care within individual organizations, it requires sustained inter-organizational collaboration, through which healthcare organizations collectively learn, innovate, and disseminate innovative practices across organizational boundaries (Sony et al., 2023). Healthcare networks, as inter-organizational collaborations, are therefore seen as a vehicle through which such collaborative transformation efforts can be pursued(Van Vooren et al., 2024). Although prior research has identified conditions associated with effective healthcare networks and conditions that enable large-scale transformation (Peeters et al., 2023; Sony et al., 2023), comparatively less attention has been devoted to the behavioral dimension of healthcare networks (Belrhiti et al., 2024). Yet healthcare networks are not merely governance arrangements, nor do they come to life simply because conditions are established. At their core, healthcare networks consist of actors (e.g., professionals) who interact related to shared network objectives and enact collaboration through their everyday practices(Long et al., 2013). This dissertation extends existing knowledge on the conditions required for effective healthcare networks by providing additional insights into how actors collaborate within networks aiming to advance healthcare transformation and whether this behavior can be supported. Specifically, this dissertation examines how actors make decisions when considering different organizational models for organizing innovation (**Chapter 2**), what motivates their active engagement in healthcare networks, how such engagement can be sustained over time (**Chapter 3**), and how actors diffuse and disseminate innovations across organizational boundaries (**Chapter 4**). Furthermore, we developed a serious game to support healthcare professionals to experience network behaviors and reflect on their own practices (C**hapter 5**). The game also shows counterproductive behaviors that can undermine collaboration across organizational boundaries and behavior needed overcome this (**Chapter 5**). Collaboratively, these insights on actors' behavioral interactions in healthcare networks, advance the understanding of how collaboration in healthcare networks unfolds. This understanding

consequently underscores that behavior within healthcare networks should not be overlooked in either research nor practice. Rather, behavior in healthcare networks requires anticipation and management to support progress, especially when aiming towards healthcare transformation. In the subsequent sections, the main findings regarding actors' behaviors in healthcare networks will be highlighted.

Perceptions of actors influence organizational innovation choices

Chapter 2 examines the considerations underlying the choice of how to organize an innovation such as telemonitoring. Telemonitoring involves the remote monitoring of patients' health status, such as heart rate, blood pressure, and oxygen status(Claggett et al., 2024). By shifting elements of care from the hospital to home settings, telemonitoring has the potential to reorganize where and how care is provided. This can improve self-management, reduce unnecessary admissions, and alleviate pressure on healthcare capacity(Huygens et al., 2021). These outcomes directly address several faced by challenges health systems face and align with multiple objectives in the Integral Care Act(Zorgakkoord, 2022). Organizations may opt for a centralized monitoring center, a model that substantially reshapes care design, task redistribution, and regional collaboration. Alternatively, they may choose a distributed model, which can preserve established workflows but enhance them when implementing telemonitoring technology. Each organizational model has a distinct value proposition and may be appropriate depending on the contextual fit. Although the range of relevant considerations can be presented in the form of a structured checklist, our findings indicate that the choice of an appropriate organizational model is ultimately shaped by the interplay of considerations related to patient condition (e.g., suitability for remote monitoring), the implications for alert management, and alignment with strategic objectives (C**hapter 2**). Our research shows that these considerations are shaped by the perceptions and value judgements of especially healthcare professionals, which aligns with previous work showing that their attitudes (value, believes and aligned activities) influence both the decision to adopt an innovation and how it is implemented(Liljeroos & Arkkukangas, 2023). Our findings further indicate that healthcare professionals begin by identifying clinical pathways they consider suitable for remote monitoring, a choice often guided by patient-centered objectives and perceptions of the added value of telemonitoring **(Chapter 2)**. While this approach may appear intuitive, such decisions have broader implications, as they influence

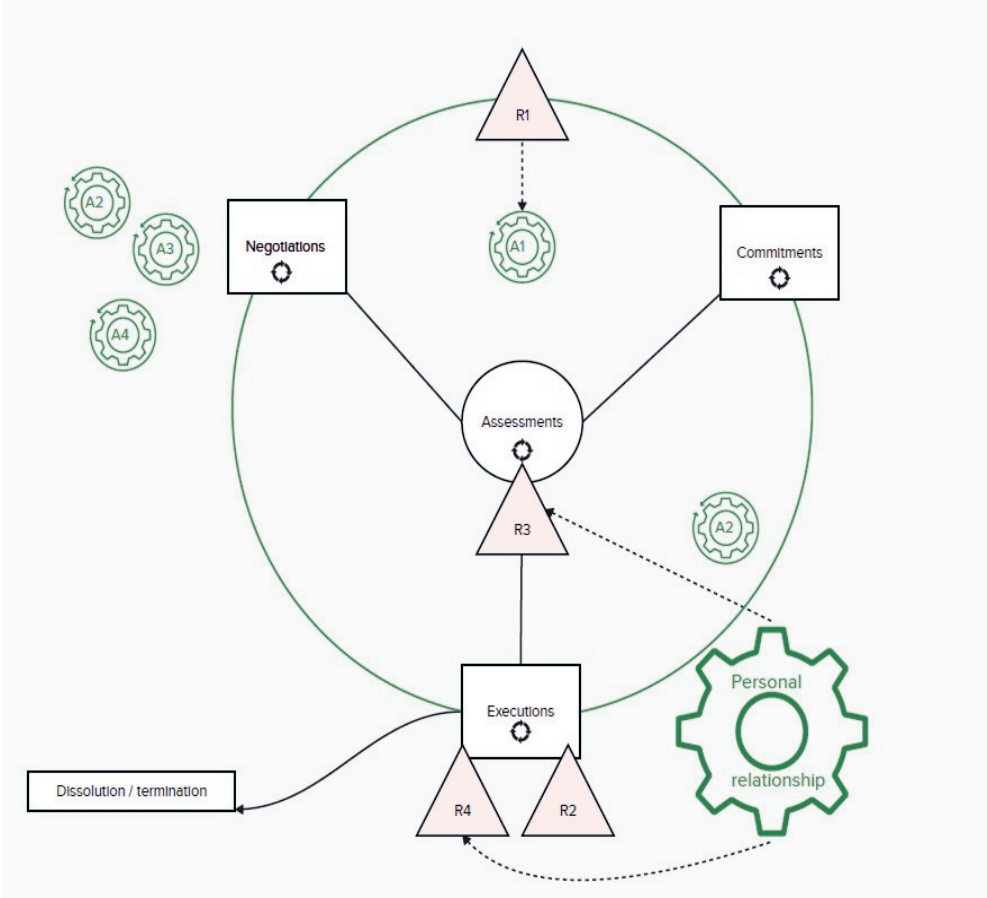
organizational processes (e.g., workflow, use of capacity) and affect regional coordination of care (e.g., what is expected of network partners). Thus, healthcare professionals' perceptions and value judgements influence not only whether an innovation is adopted, but also the organizational model, with consequences or the organizational level and inter-organizational care coordination. It is therefore important that professionals involved in these decisions are aware of the wider organizational and inter-organizational consequences of their choices. Findings from **Chapters 2 and 4** further suggest that decisions regarding innovations, such as the selection of organizational models, rely on specific competencies of decision makers (i.e., healthcare professionals or managers). These include knowledge of existing workflows, an understanding of organizational culture, and awareness of professional's attitudes towards shifting responsibilities. Taken together, this chapter shows that the perceptions and value judgments of healthcare professionals influence not only the adoption of innovations but also organizational choices, such as the selection of organizational models for implementation. Decision makers must therefore be aware of how their attitudes and judgements shape the selection of organizational models. In addition, decision makers should possess the competencies necessary to assess which model fits their organizational context best and to ensure alignment on the professional, organizational and network level. When such competencies are limited, decision-making processes may benefit from specific training or decision-making tools(Dubromel et al., 2020).

Actors' commitment to the network requires continuous management

Although healthcare networks are often established with the aim of improving collaboration and enabling transformation, ensuring that these networks function effectively remains challenging. Previous research has identified that several conditions are important for effective healthcare networks, such as aligning goals, selecting appropriate governance modes, formalizing task distribution, and establishing mechanisms for knowledge sharing and trust(De Pourcq et al., 2019; Peeters et al., 2023). While these conditions provide an important foundation for collaboration, these conditions do not automatically ensure that networks will perform as intended. As **Chapter 3** demonstrates, collaborative efforts may still stagnate despite any formal arrangements if the behaviors of participating actors are not anticipated or continuously managed (C**hapter 3**). One focal point in this regard is the long-term commitment of network actors. Sustained commitment is particularly critical for healthcare networks aiming for transformation,

as such processes unfold over an extended period and require consistent engagement(Willis et al., 2012). Sustained commitment enables continuity of collaborative efforts, allowing network actors to coordinate actions, disseminate innovations, and develop interpersonal relationships, all necessary for effective collaboration(Castiglione & Lavoie-Tremblay, 2021; Provan & Lemaire, 2012). Yet, because healthcare transformation unfolds over an extended period, the network will inevitably encounter obstacles that put the collaboration at risk(Shin et al., 2020). Building on the foundational work of Ring and Van de Ven(1994), **our dynamic model** provides a framework of why actors' network commitment tends to decline at different phases of the network and outlines which managerial approaches should be used to address these challenges **(Chapter 3)**. Figure 1 illustrates the cyclical stages through which networks evolve, as conceptualized by Ring and van de Ven (1994). In the first stage, *negotiation*, network actors align expectations, roles, and resource contributions. The second stage, *commitment*, involves actors selecting an appropriate collaborative approach, establishing governance arrangements, and initiating processes of trust-building. The third stage, *execution*, concerns the enactment of these commitments through actions. Across all stages, interactions between actors are characterized by an ongoing interplay between formal arrangements and informal relational processes. Building on this model, our contribution lies in identifying specific reasons (R) why the commitment of network actors may wane, as well as the approaches (A) of network coordinators to prevent or address this. Furthermore, our findings in **Chapter 3** explain that going through repeated cycles contributes to the development of interpersonal relationships among network actors (illustrated as wheel). These relationships themselves can mitigate reasons that would lead to diminishing network commitment.

Figure 1. A dynamic model for network commitment and managerial approaches. R= reason for decline of commitment A= Managerial approach to sustain commitment



Our dynamic model suggests that network commitment is not a static condition that is either present or absent. Rather, it evolves over time and requires ongoing management. For example, failure to celebrate successes (R2), conduct periodic evaluations of network objectives and members' evolving needs (R1), or continuously facilitating knowledge-sharing (R3) can undermine engagement after a while in the network. Our findings in **Chapter 3** show that network actors must experience tangible and immediate value from their participation, whether through visible progress or meaningful knowledge exchange. **Chapter 4** further highlights how knowledge exchange can be facilitated in healthcare networks. When the added value of network participation is not perceived, according to the respondents (**chapter 3**), actors fall back into

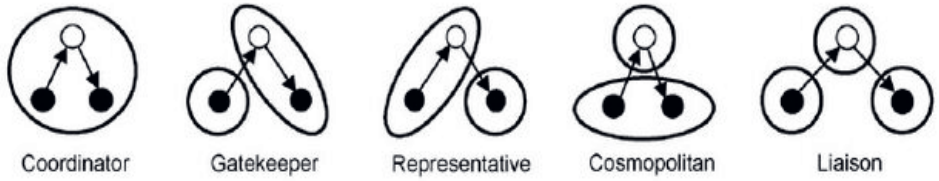
focusing on organizational priorities, exhibiting inward-oriented behavior that is counterproductive to collective efforts, a pattern that is further elaborated in **Chapter 5** as counterproductive behavior. Thus, this dissertation underscores that while upfront arrangements for networks are important, after initiating the network the relational processes start. Over time, actors' commitment to the network may decline, endangering the collective efforts and the achievement of network objectives. Commitment must therefore be continuously managed so that healthcare networks can maintain momentum and sustain their collaboration toward healthcare transformation.

Dissemination of innovations depends on actors' brokerage behavior

C**hapter 4** shows that the dissemination and adoption of innovations within healthcare networks are shaped by actors' behaviors. Whether innovative practices or knowledge is shared, accessed, translated, and mobilized across organizational boundaries depends on how individuals engage in the network, which ultimately determines whether innovations These findings align with previous research, where diffusion is seen as a social process at different levels (Van Lunenburg et al., 2020) and further highlight that dissemination is enacted through distinct roles within the network. These roles, conceptualized as broker roles by Gould and Fernandez (1989), can be distinguished based on their structural position, that is, *where* they are situated in the network (e.g., within the organization, between organizations)(Long et al., 2013). Broker roles can also be characterized by a set of activities, each contributing in its own way to dissemination of innovations in the network(Williams et al., 2021). The *representative* shares expertise and actively engages with network partners, the *gatekeeper* acquires, assesses, and transfers relevant information into the organization, and the *coordinators* operate internally to coordinate innovative practices. Additionally, the *cosmopolitan*, as an external actor, facilitates intra-organizational collaboration, and the *liaison* connects organizations by translating and transferring knowledge across boundaries. Figure 2 illustrates the five brokerage roles.

Figure 2 Visualization of five distinct broker roles of Gould and Fernandez (1989) visualization by (Kirkels & Duysters, 2010)

- Coordinator: enhances interaction between members of the group he belongs to
- Gatekeeper: absorbs knowledge from a group and passes its to the group he belongs to
- Representative: diffuses knowledge of the own group to another group
- Cosmopolitan (Itinerant): mediates as an outsider between members of the same group
- Liaison: enhances as an outsider interaction between different groups



Collectively, these broker roles form the backbone of continuous dissemination of innovations within the network, thereby contributing to healthcare transformation objectives. In **Chapter 4** we identified a distinct set of activities enacted by each broker role in the context of innovation dissemination within an inter-organizational healthcare network of multiple hospitals. Our findings show that different brokers enact different forms of behaviors, each contributing in their own way to the dissemination of innovations. Chapter 4 further argues that actors within healthcare networks need to be aware not only of their position within their organization but also of their broader role within the network and the healthcare system. Such awareness enables actors to contribute to dissemination of innovations and, in doing so, to collective transformation efforts. Recognizing and formalizing broker roles within the network can support this process(Van Vooren et al., 2024), shifting brokage in healthcare from an implicit and incidental function to a more deliberate and actively supported practice(Podmetina et al., 2018). However, the mere presence or positioning of actors does not automatically translate into effective knowledge exchange and innovation dissemination. Dissemination mechanisms must be deliberately activated and guided by individuals with the appropriate skills(Macciò & Cristofoli, 2017; Van der Ven et al., 2025). As **Chapter 4** further shows, while role clarity and role awareness are important, enactment of the roles also depends on the competencies required to perform broker activities. As different broker roles perform distinct activities within the

dissemination process in the network, they also require specific competencies, including contextual awareness, translation capabilities, and networking skills (**Chapter 4**). Thus, **Chapter 4** indicates that enactment of different brokerage behaviors by actors is crucial for the dissemination of innovations within the network and underscores the importance of role awareness and competencies required to collaborate as actors within an inter-organizational network.

Experiencing behavior through a serious game

Building on the theoretical and empirical findings of **Chapter 4**, a serious game was developed as a practical tool to support healthcare professionals experience and reflect on brokerage behavior within networks. The serious game in **Chapter 5** aims to enhance role awareness in practice by enabling participants to recognize different brokerage roles and their behaviors. In doing so, it also addresses counterproductive behaviors that hinder collaboration and knowledge exchange in healthcare networks. For example, behaviors such as maintaining silo's(Bento et al., 2020), exhibiting non-reciprocity(Swärd, 2016), or adopting an inside-out framing (e.g., failing to translate insights to the receiver's context (Williams et al., 2021)) are known to constrain knowledge exchange and network collaboration, thereby hindering progress towards network objectives. **Chapter 5** outlines the development and iterative refinement of the game and investigates the behaviors that emerge during gameplay, particularly how counterproductive behavior is overcome. In doing so, **Chapter 5** illustrates how actors' behaviors can either strengthen or undermine collaborative efforts in healthcare networks(Melo & Bishop, 2020; Pedersen et al., 2024).

Taken together, the findings across these chapters indicate that the behavioral dimension should not be treated as secondary to formal conditions. Rather, behavior within healthcare networks requires anticipation and continuous management, as the function of such networks is ultimately shaped by the actions and interactions of the actors involved. Healthcare professionals therefore need to be aware that, in addition to their clinical or managerial responsibilities, they shape decisions regarding innovations with organizational implications and contribute to healthcare transformation through brokerage behavior within and across organizations. To effectively enact such behavior, actors require competencies, both within their organization, to make well-informed decisions, and in inter-organizational collaboration, to contribute to and benefit from

the network. At the same time, collaboration within networks inevitably encounters challenges that may jeopardize collective efforts. These challenges must be anticipated and continuously managed, including the recognition and mitigation of counterproductive behavior.

Going through network phases

An important aspect of healthcare networks aiming for healthcare transformation is the temporal nature of these inter-organizational collaborations as both transformation unfolds and networks mature over time (Charlesworth et al., 2016; Hearld & Westra, 2022). This makes healthcare networks progress through phases that shape both their functioning and managerial needs (**Chapter 3**). For example, the dynamic model (Figure 1.) illustrates that different phases of network development require different management approaches and that network commitment requires continuous management. However, this temporal dynamic extends beyond commitment alone. As networks mature, our findings suggest that other behavioral dimensions likewise evolve. One example is knowledge exchange, particularly the nature of knowledge about innovations required by network actors, which shifts as the network progresses through its phases. In the early phase of the network, individuals get acquainted, learn to identify where expertise resides, and learn about other innovative practices. This access to new knowledge, which they would otherwise not obtain (**Chapter 4**), generates immediate value for network members and, in turn, creates initial commitment of actors to the network (**Chapter 3**). As networks transition to a phase where innovations are being implemented, knowledge demands become more specific and context-sensitive, shifting toward practical guidance and insights into, for example, the organizational implications of selecting innovation models (**Chapters 2**). Thus, as network actors go through cycles of collaboration, knowledge needs evolve, which requires continuous attention. When knowledge exchange is not coordinated or facilitated, imbalances may emerge between contributors (e.g., representatives) and recipients (e.g., gatekeepers) in the network (**Chapters 3 and 4**). In such situations, actors primarily enact gatekeeper behavior, extracting information for their own organizations, while others enact representative behavior, investing time and effort in supporting the network but receiving limited reciprocal benefit (**Chapter 4**). This imbalance can lead to the perception of non-reciprocity, which ultimately affects the network commitment of actors and affects collaborative efforts (**Chapter 3 and 5**). So, as both the demand for knowledge and its nature evolve as networks go through multiple

phases, this process requires continuous management to support the networks capacity for collective learning and healthcare transformation(Van Vooren et al., 2024). For example, by facilitating reciprocal behavior between actors and ensuring that relevant knowledge is connected and shared at the right time. Finally, just as the nature of knowledge exchange changes over time, so too does the prominence of the different broker roles within the network. Because broker roles are neither static nor tied to a single individual but are context dependent(Battilana, 2012), their relevance and enactment appear to shift across phases. In the early phases, when actors from organizations primarily seek to gather information and aim to identify relevant expertise within the network, the *gatekeeper* role is particularly salient for organizational learning(van Rinsum et al., 2021). Meanwhile, *liaison* and *cosmopolitan* broker roles play a critical role in locating expertise across organizational boundaries and connecting appropriate actors (**Chapter 4**). As the network matures and actors engage in repeated collaboration cycles, interpersonal connections strengthen and the ability to identify others' expertise rises (**Chapter 3**). In this phase, the added value of *liaison* roles shifts from merely 'connecting actors' to coordinating actions, supporting in re-aligning objectives, and translating knowledge across contexts (**Chapters 3 and 4**). Moreover, when transformation efforts progress and workflows change, resistance to change may emerge at the organizational level (**Chapter 3**). This is the phase at which the *coordinator* role gains importance, not only within the organization acting as ambassador for the innovation (**Chapter 4**), but for the whole network, as resistance to change at the organizational level can undermine broader network commitment (**Chapters 3**).

Adopting a temporal view (i.e., acknowledging that behaviors evolve over time and across different phases of the network) therefore highlights that as healthcare networks evolve through collaboration phases, actors' behaviors, roles, knowledge needs also evolve, requiring continuous anticipation and, where appropriate, management. Examining these temporal dynamics in greater depth would be a valuable perspective in future research.

Concluding

Healthcare systems face growing pressures that collectively necessitate healthcare transformation. Achieving transformation requires more than the development of local innovations; it depends on redesigning care delivery at scale and disseminating innovations across organizational boundaries. Healthcare networks provide a 'vehicle' for doing so, enabling

organizations and professionals to coordinate actions, learn from one another, and mobilize innovations across networks. However, while formal arrangements and conditions can be established to support these processes, their presence does not guarantee that networks will achieve healthcare transformation. Ultimately, the functioning of healthcare networks is shaped by the actors within them, making it essential to understand the behaviors through which they collaborate.

This dissertation therefore empirically examined the behavioral aspects of actors collaborating in healthcare networks aiming for healthcare transformation. The findings demonstrate that actors' behavior within healthcare networks require anticipation and continuous management, as the function of such networks is ultimately shaped by the actions and interactions of the actors involved. Actors (i.e., healthcare professionals) influence decisions regarding innovations with (inter-)organizational implications and play a broader role in contributing to healthcare transformation through brokerage behavior within and across organizations. To enact their behavior effectively, actors require competencies to both support well-informed decision-making and in inter-organizational collaboration to contribute to and benefit from the network. At the same time, our findings show that collaboration within healthcare networks inevitably encounters challenges that may jeopardize transformation efforts. Such challenges must be anticipated and managed, including the recognition and mitigation of counterproductive behaviors that can be present in networks and hinder inter-organizational collaboration. Furthermore, this dissertation highlights the importance of adopting a temporal view when studying actors' behavior in healthcare networks aiming for transformation. Transformation unfolds over time, during which needs, goals, behaviors and roles evolve.

This dissertation advances understanding of how actors collaborate within healthcare networks aiming for healthcare transformation and provides insights into the behaviors that shape these collaborations. It also offers actionable knowledge for researchers, network managers, policymakers and healthcare professionals on how such behavior can be mitigated, facilitated or managed.

Limitations and future research

This dissertation demonstrates that brokerage roles are critical for innovation dissemination, knowledge exchange and collaboration, particularly when the activities of different broker roles

are enacted. While our findings and previous literature advocate for the formalization of broker roles(Van der Ven et al., 2025), less is known about the extent to which actors consciously recognize and enact these roles. Future research should examine how role awareness affects the effectiveness of innovation dissemination and knowledge exchange within healthcare networks. Role awareness can be fostered through formalization (e.g., explicitly defining brokerage roles and responsibilities) and governance arrangements or using our serious game with subsequent reflection on the different roles (**Chapter 5**). Formalization can potentially enhance accountability and responsibility(Dewi & Riantoputra, 2019), thereby fostering individual ownership of the collective growing pressures that healthcare systems face. This could be an interesting measure to empirically test.

Although this dissertation demonstrates that brokerage is critical, particularly when these roles are enacted, it did not explicitly examine how power positions shape collaborative efforts or brokering activities in healthcare networks(Grolman et al., 2025). Power dynamics did not emerge as a dominant theme in Chapter 3, nor in other chapters. Moreover, in the development of the serious game, power was deliberately excluded to maintain the focus on collaborative behaviors in healthcare networks and role awareness. This omission is nevertheless noteworthy, as power asymmetries are widely recognized as influential in inter-organizational collaborations(Dewulf & Elbers, 2018; Noyes, 2022; Wong et al., 2017). Power dynamics may affect whose knowledge is valued and accessed, and whether knowledge is shared at all (Long et al., 2013). Future research should therefore investigate how power dynamics affect decision-making of organizational models for telemonitoring, how power affects network commitment of network actors, and whether it influences innovation dissemination in healthcare networks, for instance, through the “not invented here syndrome”(Huynh et al., 2023). Such research should conceptualize power explicitly, rather than conflating it with counterproductive behavior. While certain counterproductive behavior may be rooted in power asymmetries, such behavior can also arise unintentionally, from limited awareness, and is not necessarily reducible to dominance or unwillingness to contribute to the network. Future scholars should focus on the analytical distinction between power dynamics and other behavioral mechanisms and how these affect collaboration in healthcare networks.

Additionally, as this dissertation highlights the importance of adopting a temporal perspective when studying or managing healthcare networks with long-term objectives, this aspect warrants more research (**Chapters 4 and 6**). While time inherently emerges as a theme, the temporal view has not yet been treated as a focal analytical dimension in network research related to transformation(Hearld & Westra, 2022). Future research should examine the duration and sequencing of different network phases. Gaining deeper insight into temporal patterns, or which contextual factors influence these trajectories, would enhance our understanding of when managerial approaches are most effective. Thereby supporting more timely guidance in managing healthcare networks.

Finally, and closely related to the previous limitation, this point concerns the methodological perspective adopted in this dissertation. A strength of this research is that it builds on empirical data to understand how actors collaborate in healthcare networks and how their behavior shapes network functioning. Such empirical insights are particularly valuable when studying complex transformation processes. However, given the temporal nature of collaboration in healthcare networks, future research could benefit from methodological approaches that more explicitly examine which behaviors are effective for whom, in which contexts, and how collaborative dynamics evolve over time. For example, ripple effect mapping could help visualize how network collaboration develops over time, uncovering both intended and unintended effects and is particularly valuable for assessing the systemic impact of changes, offering insights into how a single intervention can shape broader organizational ecosystems (Emery et al., 2015; Nobles et al., 2022). Similarly, realist evaluation could be used to examine how underlying behavioral mechanisms such as trust-building influence transformation objectives and how these mechanisms evolve over time as well as in different contexts(Dalkin et al., 2015; Rycroft-Malone et al., 2011). Applying such approaches would further deepen understanding of the dynamic processes through which healthcare networks contribute to healthcare transformation.

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6

Summary

Healthcare systems in many western countries are confronted with intertwined pressures that collectively jeopardize their long-term sustainability. Population ageing, rising multimorbidity, increasing costs, and workforce constraints constitute a complex, interdependent set of challenges for which no single organization or policy instrument provides an adequate response. Sustaining the affordability, accessibility, and equity of healthcare systems requires fundamental change in the way that care is organized, delivered, and financed. This change extends beyond incremental efficiency gains as it requires a system-wide multi-level change process that, through innovation, affects multiple organizations and care providers with the aim of improving efficiency, care quality and patient outcomes. This process is commonly referred to as healthcare transformation. Because healthcare transformation is inherently a system-wide process, it cannot be achieved by individual organizations acting in isolation. It requires collaboration of multiple organizations that coordinate actions across organizational boundaries. Inter-organizational healthcare networks, in which multiple organizations collaborate towards a collective goal, have emerged as a vehicle to enable such coordination. In the Netherlands, these healthcare networks have been promoted through the Integral Care Act (Integraal Zorgakkoord). The Integral Care Act positions regional healthcare networks as an infrastructure for advancing transformation, emphasizing collaborative governance across hospitals, primary care providers, mental health services, and social welfare organizations.

Healthcare networks hold significant potential: they provide platforms for the spread of innovations, facilitate knowledge exchange on best practices, support organizational learning, and build quality improvement capacity at the system level. However, they also face considerable challenges. Recurrent difficulties include sustaining active engagement over extended periods, managing tensions and competitive interests, ensuring sufficient resources and maintaining alignment among diverse stakeholders. These challenges underscore the importance of behavioral aspects of collaborating in healthcare networks. Networks are not merely governance arrangements or formal structures; at their core, they are constituted by actors (i.e. healthcare professionals and managers policymakers) who interact within and across organizational boundaries, thereby shaping whether collective objectives are ultimately achieved. While prior research has substantially advanced the understanding of the structural and governance dimensions of healthcare networks, it has offered comparatively limited insight into how the behaviors of actors shape network functioning and whether these behaviors can be actively supported to advance transformation objectives. It is precisely the behavioral dimension that remains underexplored, and which forms the central focus of this dissertation.

This dissertation examines several behavioral aspects of actors collaborating in inter-organizational healthcare networks oriented toward system-level healthcare transformation. The overarching research question is: ***How do actors collaborate within healthcare networks aiming for healthcare transformation?*** This dissertation draws on qualitative empirical research conducted across Dutch healthcare networks. Because healthcare transformation unfolds across

multiple levels (i.e., network, organization, and individual) and through the interactions between them, this dissertation addresses collaboration of multiple levels. The chapters provide insights into several behavioral aspects that shape whether and how healthcare networks collaborate towards their transformative goals.

Chapter 2: Organizing telemonitoring

This chapter addresses the organizational level of healthcare transformation, focusing on the decisions involved in organizing a digital health innovation: telemonitoring. Telemonitoring, defined as the use of technology to monitor patients remotely, restructures care delivery by shifting elements of care from hospital to home settings. As such, it addresses several of the systemic challenges described above, including unsustainable hospital capacity, rising costs and staff shortages. Understanding *how* organizations decide to implement telemonitoring is therefore directly relevant to healthcare transformation.

Two principal organizational models were studied: a *centralized* model, in which patient monitoring is concentrated in a physical or virtual centralized monitoring center staffed predominantly by tele-nurses, and a *distributed* model, in which professionals monitor their own specific patient populations within existing workflows. This chapter applies the NASSS (Non-adoption, Abandonment, Scale-up, Spread, and Sustainability) framework to analyze decision-making across seven interconnected domains: condition, technology, value proposition, adopter system, organization, wider context and adaptation over time.

The findings reveal that the behavior of actors determines which organizational model is pursued and which are not. This chapter illustrates that the choice between organizational models is profoundly shaped by the perceptions and value judgements of key decision makers, in particular, healthcare professionals. Decisions made in the early phases of implementation, often driven by clinical considerations and perceptions of added value, carry far-reaching organizational consequences: they determine task redistribution, influence workflows, and shape the scope and nature of inter-organizational partnerships at a regional level. Centralized monitoring centers, for example, require the establishment of a new professional role (i.e. the tele-nurse) and necessitate governance arrangements across multiple organizations, creating both coordination challenges and significant systemic potential. The chapter concludes that decision-makers must possess competencies that extend beyond clinical expertise; they must be equipped to assess organizational fit, anticipate inter-organizational implications, and evaluate contextual alignment across all relevant NASSS domains.

Chapter 3: Sustaining Network Commitment

In this chapter, the focus shifts from the organizational to the network level, examining the conditions under which sustained collaboration among network actors can be maintained over time. Since healthcare transformation is a gradual process, it often unfolds across multiple years

and thus requires continuous engagement of diverse stakeholders. Yet, sustaining this engagement is a persistent challenge that healthcare networks face. Network commitment, which is the intention to remain in the network and actively contribute to its collective objectives, is widely recognized as an enabler of network effectiveness. However, the conditions under which commitment declines and the managerial approaches to address such decline, remain poorly understood.

Through an exploratory qualitative study involving representatives from Dutch healthcare improvement networks, this chapter identifies reasons for declining network commitment: (1) rising discrepancies between network objectives and the evolving needs of participating organizations; (2) perceptions of slow progress; (3) a lack of reciprocal engagement; and (4) resistance to change at the organizational level. In response to each of these challenges, corresponding managerial approaches were identified: collaborative reassessment of goals and needs; expectation management and the celebration of incremental successes; the establishment of preconditions that foster equal contribution and build trust; and the engagement of senior leadership alongside deliberate cultivation of personal relationships.

The findings are then synthesized into a dynamic model of network commitment, building on and extending Ring and Van de Ven's framework of developmental processes in cooperative inter-organizational relationships. The model emphasizes that managing network commitment is not a linear process but a cyclical one, requiring different behavioral responses at different stages of network development. Crucially, the model highlights the role of interpersonal relationships as both an outcome of sustained collaboration and a mitigating factor against commitment decline. The chapter contributes by providing empirical insight into the active management of network commitment and offers actionable guidance for network coordinators seeking to sustain collaboration toward healthcare transformation.

Chapter 4: Brokerage Behavior

Healthcare transformation is typically realized through innovations as they are widely recognized as essential drivers of system-level change. Yet despite the proliferation of innovations at the level of individual organizations and departments, healthcare systems continue to struggle with the same persistent challenges. A principal explanation lies in the predominantly local character of many innovations: developed within specific organizational contexts, they are rarely transferred successfully across institutional and professional boundaries. Without effective diffusion and dissemination, innovations remain isolated improvements rather than catalysts for system-wide change. The challenge of scaling innovations across organizational boundaries has brought attention to the role of *intermediaries* (e.g. individuals such as healthcare professionals, managers, and policy advisors) who function as bridges between disconnected actors and organizations. This act of bridging, often conceptualized as knowledge brokering, has been identified as a critical but underexplored mechanism in the dissemination of innovations within and across healthcare systems. This chapter argues that this is not only a structural problem but a behavioral one: whether

and how innovations are shared, assessed, translated, and adopted depends on the behavior of the individuals who occupy key positions in the network.

Drawing on a qualitative case study conducted within a Dutch nationwide network of 27 teaching hospitals, and building on the five brokerage roles conceptualized by Gould and Fernandez (1989), this chapter examines how actors enact specific brokerage behaviors to facilitate the dissemination of innovations across organizational boundaries. The five roles (i.e. coordinator, gatekeeper, representative, liaison, and cosmopolitan) each occupy a distinct structural position in the network and enact a characteristic set of activities. Beyond identifying the activities associated with each broker role, the chapter inductively identifies the competencies required to enact these roles effectively. The chapter concludes that brokerage in healthcare networks should be understood not as the activity of a single designated individual, but as a collective process enacted through configurations of complementary broker roles. Formalizing and deliberately cultivating these roles through role clarity, training, and governance holds significant potential for strengthening the capacity of networks to disseminate innovations at scale.

Chapter 5: A Serious Game "Care to Collab?"

The fifth chapter translates the theoretical and empirical insights of Chapter 4 into a practice-oriented, experiential learning intervention: a serious game specifically designed to enable healthcare professionals and managers to recognize, experience, and reflect upon brokerage behavior within a simulated inter-organizational collaboration. The game, titled "Care to Collab?", structures a simulated regional healthcare network comprising three organizations (a hospital, a midwifery practice, and a general practice), with a minimum of six players. Through a combination of constrained communication pathways, individually assigned goals, and deliberately distributed information cards, the game places each player in a distinct position and challenges them to collaborate across organizational boundaries to resolve a shared crisis scenario. The game was tested across a range of settings.

The results demonstrate in this chapter that the game elicited diverse brokerage behaviors, surfaced tensions arising from competing individual and collective goals, and prompted recognition of counterproductive behaviors including organizational siloing, non-reciprocity, and inside-out framing. Through gameplay and guided reflection, players not only enacted different broker roles but also developed greater awareness of the dynamics that undermine collaborative efforts. The chapter concludes that the serious game offers a promising and accessible tool for bridging the research-to-practice gap, facilitating both experiential learning and reflective insight into the conditions that enable or constrain collaboration in healthcare networks.

Discussion

The four empirical chapters are not to be seen as isolated studies but as interconnected inquiries into behavioral aspects of actors collaborating in healthcare networks aiming for healthcare

transformation. Taken together, these findings advance a consistent argument: the functioning of inter-organizational healthcare networks is ultimately shaped by the actions and interactions of the actors within them. Decision-making at the organizational level carries organizational and inter-organizational consequences, underscoring the need for well-informed decision-making. Network commitment is not a given but will be challenged over the time, requiring continuous management and anticipation. Brokerage behavior determines whether innovations disseminate across the network and must therefore be recognized, formalized and supported. Moreover, counterproductive behaviors must be identified and addressed before they undermine collective efforts.

Since healthcare transformation is a gradual process, time emerged as a theme through out this dissertation. This chapter argues that adopting a temporal perspective is indispensable for understanding how behaviors, roles, and managerial needs change as networks mature and as the nature of knowledge demands shifts across phases. In the early phases of a network's lifecycle for example, actors are primarily engaged in forming relationships, identifying where expertise resides, and accessing knowledge that would otherwise be unavailable. This initial exposure to new knowledge generates immediate value, which motivates commitment and fuels engagement. As networks mature and move toward implementation phases, knowledge demands become more specific and context-sensitive, requiring practical guidance on the organizational implications of innovation choices. Simultaneously the prominence of broker roles shifts and the reasons for decline in network commitment, as discussed in Chapter 3.

Concluding

This dissertation advances understanding of how actors collaborate within inter-organizational healthcare networks aiming for healthcare transformation. Through four empirical studies, it demonstrates that behavioral aspects of network collaboration are not secondary to structural conditions. Behavior of actors shape healthcare network functioning and whether they reach their transformation objectives. Healthcare transformation requires more than establishing networks and formulating collective objectives; it depends on the ongoing, well-supported, and collaborative behavior of the actors within them. Decision-making on innovation carries (inter-) organizational consequences; networks commitment is challenged by the behavior of network members and requires continuous management; brokerage behavior determines whether innovations cross organizational boundaries; Counterproductive behaviors, if left unaddressed, risk undermining collective efforts.

The dissertation offers contributions to both academia and practice. For researchers, it advances theoretical frameworks of network commitment, brokerage, and innovation dissemination, and calls for a more explicitly temporal approach to network research. For practitioners (e.g., network managers, healthcare professionals, and policymakers alike) it provides actionable insights into how collaborative behaviors can be supported, counterproductive dynamics can be mitigated, and healthcare networks can be sustained in their pursuit of system-level transformation.

Nederlandse samenvatting

Introductie

Ons zorgsysteem wordt al langere tijd geconfronteerd met onder andere vergrijzing, toenemende zorgkosten en een groeiend arbeidstekort. Deze uitdagingen zorgen er gezamenlijk voor dat het huidige zorgsysteem onder druk staat en dat de wijze waarop de zorg georganiseerd, geleverd en gefinancierd wordt fundamenteel moet veranderen. Deze verandering vereist meer dan incrementele verbetering van processen, dit vraagt om zorgtransformatie. Onder zorgtransformatie verstaan wij een systeemverandering die meerdere organisaties, domeinen, professionals en patiënten raakt, en waarbij de kwaliteit en efficiëntie van de zorg worden verbeterd door bijvoorbeeld zorginnovaties. Zorgtransformatie vereist daarom een samenwerking tussen domeinen en organisaties die gezamenlijk afstemmen hoe zij hun activiteiten anders kunnen inrichten en coördineren. Een samenwerking tussen drie of meerdere organisaties die een gemeenschappelijk doel hebben noemt men zorgnetwerken. Deze zorgnetwerken bieden, naast coördinatie van taken ook de mogelijkheid om van elkaar te leren, kosten te delen en innovaties op te schalen. Zodoende draagt samenwerken in zorgnetwerken bij aan de verbetercapaciteit op systeemniveau, mits deze samenwerking effectief is én blijft. De afgelopen jaren is er onderzoek gedaan naar effectieve zorgnetwerken, waarbij een gezamenlijk doel, onderlinge communicatie, kennisdeling, meetbare afspraken en betrokkenheid bij het netwerk belangrijke factoren zijn. Tegelijkertijd kent samenwerking in zorgnetwerken ook uitdagingen: het is moeilijk om structurele financiering te krijgen, de netwerk doelen en behoeften goed af te stemmen en de betrokkenheid van partijen te waarborgen, stuk voor stuk cruciale voorwaarden voor zorgtransformatie. Bestaand onderzoek richt zich vooral op bestuurlijke afspraken, maar zorgtransformatie komt uiteindelijk tot stand door hoe professionals samenwerken: hun acties en interacties bepalen of de gezamenlijke doelen daadwerkelijk worden behaald. In Nederland worden zorgnetwerken gestimuleerd door o.a. het Integraal Zorgakkoord (IZA) dat regionale netwerken aan moet sporen om tot zorgtransformatie te komen. Om de samenwerking in zorgnetwerken gericht op zorgtransformatie te kunnen stimuleren, helpt het om te begrijpen *hoe* professionals samenwerken in zorgnetwerken. Juist deze gedragsaspecten van samenwerken in zorgnetwerken vormt de focus van dit proefschrift. De overkoepelende onderzoeksvraag luidt: *Hoe werken actoren samen in zorgnetwerken die streven naar zorgtransformatie?*

Hoofdstuk 2: Het organiseren van Telemonitoring

Een zorginnovatie die de manier van organiseren en leveren van zorg in Nederland ingrijpend veranderd is ‘telemonitoring’. Door inzet van technologie kan de patiënt op afstand gemonitord worden, waardoor de ziekenhuiszorg verschuift naar de thuisomgeving. Dit verandert niet alleen de zorginhoud, maar ook hoe organisaties hun processen, rollen en samenwerkingsverbanden moeten inrichten. De beslissing om telemonitoring te implementeren is daarmee niet alleen een technische keuze, maar raakt aan bredere vraagstukken over organisatieverandering en zorgtransformatie. Inzicht in hoe professionals beslissingen maken biedt kansen om meer te

begrijpen over mechanismen achter zorgtransformatie. Dit hoofdstuk onderzoekt daarom welke overwegingen een rol spelen bij de implementatie van telemonitoring.

Het hoofdstuk gaat in op twee bestaande organisatiemodellen om telemonitoring te organiseren: een *gecentraliseerd* model, waarbij er op een (fysieke of virtuele) centrale plek monitoring van meerdere patiënten plaatsvindt door o.a. tele-verpleegkundigen, en een *gedistribueerd* model, waarbij professionals hun eigen patiëntenpopulatie monitoren binnen bestaande werkprocessen. In dit hoofdstuk wordt het NASSS-raamwerk (Non-adoption, Abandonment, Scale-up, Spread, and Sustainability) toegepast om de overwegingen voor een bepaald model te analyseren langs zeven domeinen: aandoening, technologie, waarde propositie, adoptie, organisatie, context en adaptatie gedurende een langere tijd.

De bevindingen in dit hoofdstuk laten zien dat de keuzes tussen organisatiemodellen sterk worden bepaald door de percepties en waardeoordelen van betrokken zorgprofessionals. Beslissingen die vroeg in het implementatieproces worden genomen, vaak gedreven door klinische overwegingen en verwachtte meerwaarde van telemonitoring, hebben organisatorische gevolgen. Deze beslissingen bepalen namelijk de herverdeling van taken, beïnvloeden werkprocessen en samenwerkingsverbanden met zorgaanbieders in de regio. Daarom moeten professionals die besluiten over organisatiemodellen van telemonitoring over de juiste competenties beschikken die verder reiken dan klinische expertise. Professionals moeten in staat zijn om keuzes te beoordelen op organisatorische en inter-organisatorische geschiktheid.

Hoofdstuk 3: Betrokkenheid in het netwerk behouden

Zorgtransformatie is een geleidelijk proces dat voortdurende betrokkenheid van netwerkleden vereist. Netwerkcommitment – de intentie en activiteiten van netwerkleden om actief bij te dragen aan het netwerk om gezamenlijk doelen te bereiken – is dan ook een belangrijke voorwaarde voor netwerk effectiviteit. Tegelijkertijd blijk het in de praktijk een grote uitdaging en is het behouden van netwerkcommitment over langere tijd voor veel netwerken moeilijk. In dit hoofdstuk verschuift de focus van het organisatieniveau naar het netwerkniveau en wordt onderzocht hoe betrokkenheid van netwerkleden bij het netwerk gedurende langere tijd kan worden behouden.

De voornaamste redenen voor afnemende betrokkenheid die zijn geïdentificeerd worden in dit hoofdstuk beschreven: 1) De netwerkdoelstellingen en behoeften van netwerkleden lopen toenemend uiteen. 2) De voortgang verloopt vaak té traag. 3) Er is een gebrek aan wederkerigheid. 4) Er is weerstand tegen verandering. Ook zijn er manieren geïdentificeerd om hiermee om te gaan zoals: De doelen en behoeften evalueren en aanpassen, verwachtingsmanagement toepassen en successen vieren, het stellen van randvoorwaarden, het betrekken van leiderschap en mandaat en tot slot het faciliteren van persoonlijke relaties. Deze bevindingen komen samen in een dynamisch model, voortbouwend op het werk van Ring en Van de Ven. Dit model benadrukt niet alleen dat langdurig samenwerken in een netwerk geen lineair maar een cyclisch proces is, maar ook dat verschillende stadia van samenwerken om andere

interventies vraagt. Dit hoofdstuk levert een theoretische bijdrage door empirisch inzicht te bieden in langdurige betrokkenheid in zorgnetwerken en biedt concrete handvatten voor netwerk coördinatoren die de langdurige samenwerking in netwerken willen bevorderen.

Hoofdstuk 4: Verbindend handelen

Zorgtransformatie vraagt om innovaties die de organisatie en financiering van de zorg fundamenteel veranderen. Ondanks de groeiende hoeveelheid aan zorginnovaties in zorgorganisaties blijven zorgsystemen worstelen met dezelfde hardnekkige uitdagingen. Een reden hiervoor ligt in het overwegend lokale karakter van veel zorginnovaties. Deze worden ontwikkeld binnen een specifieke zorgcontext en zelden met succes verspreid naar buiten deze context. Terwijl verspreiding naar andere organisaties juist bijdraagt aan zorgtransformatie. In dit hoofdstuk wordt onderzocht hoe innovaties worden verspreid in een zorgnetwerk van 27 ziekenhuizen. In het bijzonder ligt de focus op de rol van professionals (actoren) die fungeren als schakel tussen organisaties. De actoren die een schakel zijn in het netwerk worden ook wel *brokers* genoemd en het leggen van contact tussen twee andere actoren, verspreiden van informatie en faciliteren van samenwerking wordt *brokerage* genoemd. Eerder onderzoek heeft zich voornamelijk gericht op de positie van *brokers* in een netwerk bijvoorbeeld, met hoeveel actoren is deze *broker* verbonden. Dit hoofdstuk betoogt juist dat het verspreiden van innovaties niet alleen ligt aan de positie van een *broker* maar vooral ook het gedrag van de *broker*. Het gedrag van de *broker* bepaalt of en hoe innovaties worden verspreid, getransleerd, geadopteerd en geborgd in de praktijk.

Dit hoofdstuk bouwt voort op de vijf *broker*-rollen die zijn geïdentificeerd door Gould en Fernandez (1989). De coordinator, gatekeeper, representative, cosmopolitan en liaison. Door middel van empirisch onderzoek zijn de *broker* activiteiten van elke rol in een zorgnetwerk gericht op zorginnovatie geïdentificeerd. Uit de resultaten blijkt dat elke *broker* rol een unieke functie bekleed in het netwerk en de rollen gezamenlijk zorgen voor effectieve verspreiding van zorginnovaties. Professionals die deze *broker* rollen bekleden in het netwerken moeten zich hier dan wel bewust van zijn en de geschikte competenties hebben om deze rollen in het netwerk te vervullen. Door middel van rolbewustzijn, trainingen en door innovatie verspreiding te zien als collectief proces, kan het potentieel van een zorgnetwerk gericht op innovatieverspreiding vergoot worden.

Hoofdstuk 5: De Serious Game: Samenwerken in Netwerken

Het vijfde hoofdstuk van dit proefschrift vertaalt de theoretische en empirische inzichten uit Hoofdstuk 4 naar een spel vorm. De serious game is ontwikkeld om zorgprofessionals *brokerage* gedrag te laten ervaren, herkennen en op te reflecteren binnen een gesimuleerd scenario. Het scenario van de serious game ‘Care to Collab?’ speelt zich af in een regionaal netwerk bestaande uit drie organisaties; het ziekenhuis, de verloskundigenpraktijk en de huisartsenpraktijk. Op elke organisatielocatie werken twee spelers, met in totaal dus een minimum van zes spelers. Elke speler heeft een eigen opdracht, maar er is ook een collectief doel. Via een combinatie van

beperkte communicatiekanalen, conflicterende doelen en de gekozen netwerkstructuur wordt elke speler in een onderscheidende *broker* positie geplaatst. De spelers zullen over organisatiegrenzen heen moeten samenwerken om het spel succesvol af te ronden.

Dit hoofdstuk bevat een beschrijving van de ontwikkeling van het spel en de resultaten van het testen in de praktijk. De serious game en daaropvolgende reflectiesessie maakte negatieve gedragingen in netwerken zichtbaar en bespreekbaar. Bijvoorbeeld silo-gedrag, waarbij spelers binnen hun eigen organisatiegrenzen blijven, gebrek aan wederkerigheid en inside-out framing, waarbij spelers informatie niet kunnen transleren door vanuit hun eigen context te redeneren. Door deze ervaringen te koppelen aan theorie, ontwikkelden spelers een bewustwording van de verschillende rollen in het netwerk en leerden de speler hoe gedrag de samenwerking in het netwerk kan bevorderen of belemmeren. De serious game is een toegankelijk instrument om theorie en praktijk aan elkaar te verbinden.

Discussie

De hoofdstukken laten gezamenlijk zien dat het gedrag van actoren in zorgnetwerken een grote rol speelt om tot zorgtransformatie te komen. Naast de positie van actoren en bestuurlijke afspraken in het netwerk vereist het gedrag van actoren in het netwerk continu bijsturing. Langdurige samenwerking in zorgnetwerken vraagt om anticiperen op de afnemende betrokkenheid van actoren en het stimuleren van wederzijdse kennisdeling. De actoren die deze kennisdeling mogelijk maken moeten ook de juiste competenties bezitten om deze taken uit te voeren en zullen zo nodig gefaciliteerd moeten worden. Daarnaast zal gedrag dat de samenwerking verhinderd voorkomen moeten worden.

In dit laatste hoofdstuk wordt het tijdsaspect van samenwerken in zorgnetwerken als thema belicht. Het tijdsaspect is inherent aan zorgtransformatie dat geleidelijk ontstaat. Gedurende deze tijd zal de samenwerking in het netwerk verschillende stadia doorlopen en daarin verschillende interventies nodig hebben om het collectieve doel te behalen. In deze verschillende stadia is er bijvoorbeeld een andere behoefte aan kennis uitwisseling tussen de organisaties en hoe actoren deze kennis uitwisseling in het netwerk voorzien. Zo heeft kennisuitwisseling, net als netwerk betrokkenheid, ook continue bijsturing nodig om relevant te blijven voor leden van het netwerk.

Conclusie

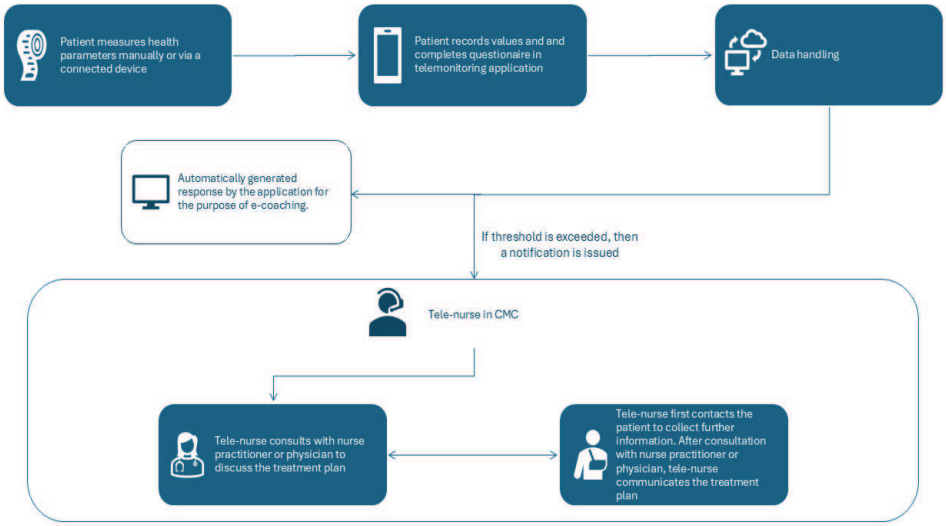
Zorgtransformatie vraagt om innovatie en samenwerking van meerder organisaties in zorgnetwerken. Met vier empirische studies laat dit proefschrift zien dat het gedrag van actoren in zorgnetwerken bepaalt hoe en of een netwerk komt tot zorgtransformatie. Het gedrag van actoren in zorgnetwerken die streven naar zorgtransformatie verdient aandacht en zal continu bijgestuurd moeten worden.

Dit proefschrift levert een bijdrage aan zowel de wetenschap als de praktijk. Wetenschappelijk introduceert het een dynamisch model voor het behoud van netwerkcommitment, verrijkt het de vijf unieke broker rollen voor innovatieverspreiding in een netwerk en wordt de tijdsdynamiek in

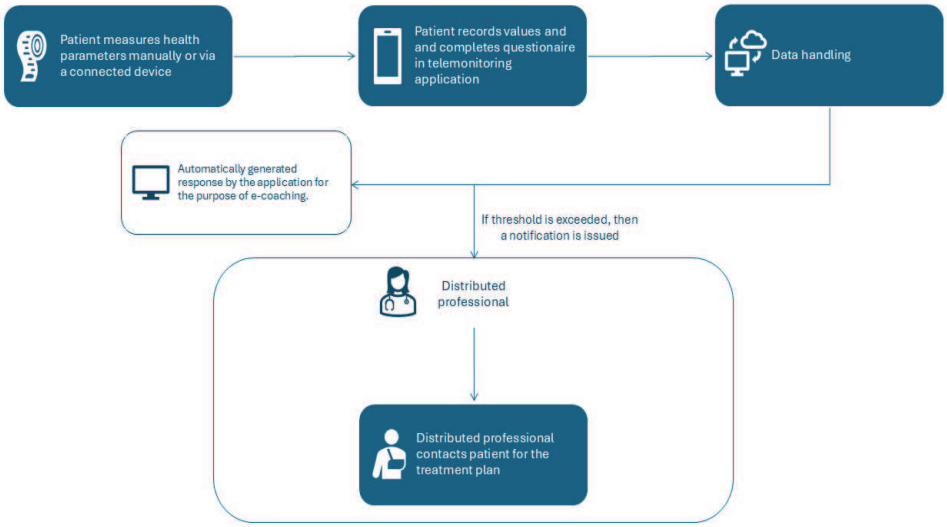
de samenwerking in netwerken expliciet benadrukt. Voor de praktijk bieden de hoofdstukken concrete aanknopingspunten om gedrag van actoren te begrijpen, ondersteunen en om contraproductief gedrag te voorkomen. Daarmee biedt dit proefschrift handvatten voor zorgnetwerken die gericht willen werken aan zorgtransformatie.

Appendices Chapter 2

Chapter 2: Centralized telemonitoring model



Distributed telemonitoring model



Chapter 2 Topic List

Project Leaders

Introduction

- Who are you?
- What is your role in this organization?
- What is your background?

General Information

- Why did you choose a centralized monitoring center?
- Are all telemonitoring care pathways managed centrally? If not, why are certain pathways managed centrally while others are not?
- Which care pathways are managed centrally? Why?
- How far along are you with the implementation of centralized telemonitoring?
- How many patients are currently participating in your centralized telemonitoring program?
- How does the telemonitoring technology integrate with other electronic systems in the hospital, such as the Electronic Patient Record (EPR)? If it doesn't, why not?

Collaboration Structure

- Why did you choose to monitor for other hospitals/general practitioners (GPs) as well?
- How is the collaboration arranged with the other hospitals/GPs?
- What is the relationship with the other hospitals/GPs in the collaboration?
- Who is ultimately responsible for the care of patients from other hospitals/GPs, for example, if an error occurs?

Implementation Process

- Were you already using distributed telemonitoring before implementing centralized telemonitoring?
- How did you start implementing centralized telemonitoring?
- Is implementing centralized telemonitoring any different than implementing telemonitoring in a single department? In what way(s)?

The Value of Telemonitoring

- How effective is centralized telemonitoring?
- Are there any differences in effectiveness compared to distributed telemonitoring? What are they, and why?
- What impact does centralized telemonitoring have on patient safety compared to distributed monitoring?
- What are the benefits of centralized telemonitoring compared to distributed telemonitoring?
- What are the challenges of centralized monitoring compared to distributed?
- What are the advantages of distributed monitoring?
- What are the challenges of distributed monitoring?

Changes Resulting from Centralized Telemonitoring

- What impact does the central monitoring center have on staffing distributed personnel?
- What qualities [competences] do personnel require to work in the monitoring center?
- To what extent does implementing this technology change the work of distributed doctors and nurses?

- What has changed in the role of doctors and nurses, in your opinion?
- What feedback have you received from nurses and doctors on centralized telemonitoring? What do you think of this feedback?
- What does centralized telemonitoring change in existing care pathways?
- Who is ultimately responsible for the care of your own hospital's patients, for example, if an error occurs?
- What feedback have you received from patients on centralized telemonitoring?
- How is centralized telemonitoring different for patients compared to telemonitoring by a single department or institution?

Finance

- How is the centralized monitoring center funded?
- How is the funding different than telemonitoring in a single hospital or department?
- How cost-effective is centralized telemonitoring? Is this different than distributed telemonitoring?

Context

- To what extent does centralized telemonitoring align with your hospital's strategy?
- How innovative is your hospital compared to other hospitals?
- What influence does politics have on the implementation of centralized telemonitoring?
- What influence do laws and regulations have on the implementation?
- What influence does the network you are part of have on the implementation?
- To what extent does your operating environment (location, etc.) influence the implementation?
- How does the context influence the implementation of centralized versus regular telemonitoring?

Future

- How do you see centralized telemonitoring developing over time?
- What challenges do you foresee in the future?

Physicians and Nurse Practitioners

Introduction

- Who are you?
- What is your role in this organization?
- What is your background?

General Information

- How is centralized telemonitoring used? Which care pathways involve centralized telemonitoring? How are those care pathways selected?
- Why are certain care pathways managed centrally while others are not?

Implementation Process

- How did you find the process of implementing centralized telemonitoring? What went well, and what didn't?
- What changes were necessary to implement centralized telemonitoring?
- Why did you choose to organize telemonitoring centrally? And why is telemonitoring in other departments distributed?

The Value of Telemonitoring

- How effective is centralized telemonitoring?

- Is the effectiveness of centralized telemonitoring any different compared to distributed telemonitoring? What are the differences, and why?
- What impact does centralized telemonitoring have on patient safety compared to distributed monitoring?
- What are the benefits of centralized telemonitoring compared to distributed telemonitoring?
- What are the challenges of centralized monitoring compared to distributed?
- What are the advantages of distributed monitoring?
- What are the challenges of distributed monitoring?

Change

- What do you think of centralized telemonitoring? How does it differ from distributed monitoring by either the patient's own healthcare provider or an external office?
- What impact does the central monitoring center have on your department?
- How has implementing this technology changed your work? How would this differ from decentralized telemonitoring?
- How has centralized telemonitoring changed your role?
- How is the collaboration between the original care providers and the monitoring center?
- What changes does centralized telemonitoring bring to the existing care pathways?
- Does the telemonitoring technology integrate with other electronic systems in the hospital, such as the EHR (Electronic Health Record)? If not, how does this affect your work?
- Who is ultimately responsible for the care of the patients in your hospital, for example, if an error occurs?
- Is centralized telemonitoring used for all patients? If not, what criteria are used for selection? Is this different than distributed telemonitoring?
- What feedback have you received from patients on centralized telemonitoring?
- How does centralized telemonitoring differ for patients compared to distributed monitoring?

Future

- How do you see centralized telemonitoring developing over time?
- What challenges do you foresee in the future?

Tele-nurses

Introduction

- Who are you?
- What is your role in this organization?
- What is your background?

General Information

- What is your role in the care pathway?
- What is your work like? How is it different than working in a department?
- Do you provide care for various conditions? If so, how do you feel about this?
- Does the telemonitoring technology integrate with other electronic systems in the hospital, such as the EHR (Electronic Health Record)? If not, how does this affect your work?
- Is centralized telemonitoring used for all patients? If not, what criteria are used for selection?
- Why are certain care pathways managed centrally while others are not?
- Do you monitor patients in need of clinical care or patients in need of outpatient care?
- How is centralized telemonitoring used? Which care pathways involve centralized telemonitoring? How are those care pathways selected?

- How did you find the process of implementing centralized telemonitoring? What went well, and what didn't?
- What changes were necessary to implement centralized telemonitoring?

The Value of Telemonitoring

- How effective is centralized telemonitoring?
- Are there any differences in effectiveness compared to distributed telemonitoring? What are they, and why?
- What impact does centralized telemonitoring have on patient safety compared to distributed monitoring?
- What are the benefits of centralized telemonitoring compared to distributed telemonitoring?
- What are the challenges of centralized monitoring compared to distributed?
- What are the advantages of distributed monitoring?
- What are the challenges of distributed monitoring?

Change

- What do you think of centralized telemonitoring?
- How do you find working with centralized telemonitoring?
- To what extent has implementing this technology changed your work compared to your previous job?
- What do other, distributed healthcare staff think of centralized telemonitoring?
- How is the collaboration between the original care providers and the monitoring center?
- What changes does centralized telemonitoring bring to the existing care pathways?
- Who is ultimately responsible for the care of the patients in your hospital, for example, if an error occurs?
- What feedback have you received from patients on centralized telemonitoring?
- How does centralized telemonitoring differ for patients compared to distributed monitoring?

Future

- How do you see centralized telemonitoring developing over time?
- What challenges do you foresee in the future?

Distributed Physicians and Nurse Practitioners

Introduction

- Who are you?
- What is your role in this organization?
- What is your background?

General Information on Telemonitoring

- How is centralized telemonitoring used? Which care pathways involve centralized telemonitoring? How are those care pathways selected?
- Why are certain care pathways managed centrally while others are not?

Implementation Process

- How did you find the process of implementing telemonitoring? What went well, and what didn't?
- What changes were necessary to implement telemonitoring?

- Why did you choose to implement distributed telemonitoring? And why is telemonitoring in other departments still centralized?

The Value of Telemonitoring

- How effective is distributed telemonitoring?
- Are there any differences in effectiveness compared to centralized telemonitoring? What are they, and why?
- What impact does distributed telemonitoring have on patient safety compared to centralized monitoring?
- What are the advantages of distributed monitoring?
- What are the challenges of distributed monitoring?
- What are the benefits of centralized telemonitoring compared to distributed telemonitoring?
- What are the challenges of centralized monitoring compared to distributed?

Change

- What do you think of distributed telemonitoring? How does it differ from centralized monitoring? Or monitoring by an external office?
- What impact does the use of telemonitoring have on your department?
- How has implementing this technology changed your work? How might this differ from centralized telemonitoring?
- How has distributed telemonitoring changed your role?
- Is the telemonitoring technology integrated with other electronic systems in the hospital, such as the EHR (Electronic Health Record)? If not, how does this affect your work?
- Who is ultimately responsible for the care of the patients in your hospital, for example, if an error occurs?
- Is telemonitoring used for all patients? If not, what criteria are used for selection? Would this be different than centralized telemonitoring?
- What feedback have you received from patients on telemonitoring?
- How is distributed telemonitoring different for patients compared to centralized telemonitoring?

Future

- How do you see centralized telemonitoring developing over time?
- What challenges do you foresee in the future?

Clinical Informaticians

Introduction

- Who are you?
- What is your role in this organization?
- What is your background?

General Information

- Why did you choose a centralized monitoring center?
- Are all telemonitoring care pathways managed centrally? If not, why are certain pathways centrally managed while others are not?
- Which care pathways have you centralized? Why?
- How does the telemonitoring technology integrate with other electronic systems in the hospital, such as the EHR (Electronic Health Record)? If it doesn't integrate, why not?

- Which apps do you use? What functions do these different apps provide?

Collaboration Structure

- What impact do the apps have on collaboration between the centralized monitoring center and distributed professionals?
- Can you access the EHR of the other hospital(s) or general practitioners? If not, why not? What are the consequences of this?

Implementation Process

- Were you already using distributed telemonitoring before implementing centralized telemonitoring?
- How did you start implementing centralized telemonitoring? What were the setbacks? What went well?
- What changes were necessary to implement centralized telemonitoring?
- What technical challenges did you encounter?
- How does implementing centralized telemonitoring differ from implementing distributed telemonitoring?
- How does the process of implementing a new care pathway work?
- What impact does centralization have on technology?
- What technical challenges and complications arise during the implementation of telemonitoring?

The Value of Telemonitoring

- How effective is centralized telemonitoring?
- Are there any differences in effectiveness compared to distributed telemonitoring? What are they, and why?
- What impact does centralized telemonitoring have on patient safety compared to distributed monitoring?
- What are the benefits of centralized telemonitoring compared to distributed telemonitoring?
- What are the challenges of centralized monitoring compared to distributed?
- What are the advantages of distributed monitoring?
- What are the challenges of distributed monitoring?

Context

- What influence does politics have on the implementation of centralized telemonitoring?
- What influence do laws and regulations have on the implementation?
- To what extent does the operating environment (location, etc.) influence the implementation?
- How does the context influence the implementation of centralized versus regular telemonitoring?

Future

- How do you see centralized telemonitoring developing over time?
- What challenges do you foresee in the future?

Focus Group

- To what extent do you recognize yourself in the results?
- Do you recognize yourself in the different implementations that hospitals have for their monitoring centers?
- To what extent do you see this reflected in practice?
- How do you see the tension between regional and (internal) network collaboration?

Appendices Chapter 3

Chapter 3: Table 1 Characteristics

Participant	Respondents' Role	Network size (n=x)	Network Participants	National/Regional	Improvement goal	Terms for participating in the networks	Funding	Network governance structure	Approach	Result
1	Expert in break-through method in different networks	Diverse networks	Healthcare professionals	Both	Establishing change with multidisciplenary teams/organizations	.	.	.	Breakthrough method and change management	Improvement of quality of care through changing practices
2	Program manager and project of network	18	Healthcare professionals	Regional	Improving quality of care	Type of organization, region and pre-existing collaborative relations	Temporary governmental funding	Program management office that coordinates and a projectleader in every participating organization.	No specific method, approach problems one by one	Decrease in hospital admissions and costs. Improvement of healthoutcomes. Better care pathway.
3	Advisor of diverse network in network formation	Diverse networks	Healthcare professionals, professionals within the social domain, professionals focusing on the environment, professionals within education and other domains	Both	Varied	-	-	Decentralized, coalition-based	Problem defining and forming coalitions based on theme's	-
4	Program manager	198	Healthcare professionals using digital care	National	Enhancing (patient) data exchange between organizations	Active participation translates to a share of the subsidies	Government subsidy	Network facilitates collaboration of participants	No specific method.	Developed an innovation, however the use of it is limited
5	Director of the network	7	Representatives of hospitals	National	Improving quality of care	Type of organization	Structural funding + participant contributions	Program management office, projectleaders and theme-based coalition	Learning network, sharing inspirational/best practices.	Policy adjustments were made on a national level
6	Network coordinator	6 (individual members)	Healthcare professionals	National	Improving public health	Type of organization/discipline, had to be multidisciplinary	Internal funding	Management team consisting of experts together with network participants. With one projectleader who takes the lead.	No specific method.	Improvement knowledge exchange
7	Network coordinator	17	Healthcare providers, and representatives of knowledge centers, volunteer organisations, and special interest groups	National	Improving quality of care	contribution, mandatory attendance, mandatory knowledge sharing	Government subsidy (yearly) Participation translates into a discount from the healthcare insurer,	Network facilitates collaboration of participants	No specific method. (learning method look-a-like)	Manifesting nation-wide change
8	Network coordinator	650	Representatives of healthcare organisations involving mental healthcare, youth healthcare, care for people with disabilities, and home- and nursing home care	National	Enhancing collaboration between organizations and improve national policies	Aligment with common goal	Government subsidies and participant contributions	Management team of 25 organizations take the lead.	collaboratively define problems and make solutions and evaluate them	Policy adjustments were made on a national level
9	Project leader and senior advisor	7	Representatives of hospitals	National	Improving quality of care and enhancing collaboration between organizations	Type of organization	Government subsidies and participant contributions	Program management office. Network with subnetworks per theme. Projectleader in every participating organization	Learning network, sharing inspirational/best practices.	Improvement of healthoutcomes
10	Network coordinator/director	90	Network consists of representatives of different subnetworks (nationwide)	National	Improving public health	Alignment with common goal	Funds (mostly internal)	Project coordinator for subnetworks per theme	Iterative, problem defining and forming coalitions based on theme's	Policy adjustments were made on a national level and the urgency for change became supported
11	Network coordinator/director	9	Patients, health care providers, representatives of health insurance companies and the government	National	Improving quality of care	Mandatory participation by the government	Government	Program management office facilitates and coordinates. Nation-wide networks with subnetworks per theme	Learning network, research approach, sharing inspirational practices and breakthrough method	75% of previously formulated goals were implemented
12	Program manager	29	Representatives of hospitals	National	Improving quality of care and enhancing collaboration between organizations	Type of organization	Subsidies and participant contribution	Program management office facilitates and coordinates. All organizations are equal.	Learning networks, sharing inspirational practices	Protocol changes
13	Program manager	15	Network consists of representatives of different subnetworks (nationwide)	Regional	Improving the quality of care and establishing Triple aim	Alignment with common goal	Healthcare insurer	Nation-wide collaboration of 15 organization with different subnetworks in 8 regions	No specific method	Scaling of digital care pathways in healthcare facilities an general practitioner offices
14	Senior advisor for diverse networks	10	Representativesso f organisations within the social domain	National	Enhancing learning capacity of regional collaborations	Common goal/objective	Government	Nation-wide network with subnetworks per theme. Projectleader who takes the lead.	Use of impactcards, the quality compass to define goals.	More citizen participation
15	Senior project officer within diverse networks	~~Interview based on research on different networks~~ Diverse networks	Representatives of healthcare organisations	National	Improving quality of care through knwoledge sharing	Mandatory participation by the government	No (structural) funding	Management team and participants. Projectleader who takes the lead	Research based	Insights in learningnetworks
16	Program manager	25 (9 sectors)	Representatives of healthcare organisations	National	Enhancing collaboration and knowledge (data) exchange	Mandatory participation by the government and all organizations were part of quality standard measurements	Government	Management team of experts. Program leader. Majority needed for decisionmaking.	Use of quality measurements to formulate change in processes	To early to tell, but agreements have been made
17	Project leader	150	Healthcare professionals	National	Improving working environment	Letter of intent for subsidy application	Temporary governmental funding	Projectleader takes the lead.	Action-research approach	To early to tell, but a lot of community support
18	Project leader	30	Healthcare professionals	International	Improving quality of care	Type of organization	Structural by the industry association	International network facilitates collaboration between organizations	Breakthrough method and change management	Found common challenges between sectors and countries

Chapter 3: **Topic Guide**	
1. Introduction	- Can you briefly introduce yourself and your professional background? - What is your age and relevant work experience?
2. Network Experience	- What kind of healthcare improvement network are you part of? - What is the size and composition of these networks? - Which organizations or partners were/are involved? - What were the goals of the networks and how did you aim to achieve them?
3. Process and Phases of Change	- What phases or steps would you distinguish in the process toward achieving healthcare improvement? - On which levels (individual, organizational, network) do these play out?
4. Achieving Change as a Network	- To what extent did the networks succeed in bringing about change? - Did you apply a specific method or approach?
5. Barriers and Challenges	- What were the main difficulties or barriers in achieving change as a network? - How did you address these challenges in practice?
6. Enablers of Change	- What supported successful change? - What characteristics or capacities were helpful—at the individual, organizational, or network level? - What kind of resources were necessary?
7. Contextual Factors	- What contextual factors affected the network's ability to implement change? - How did you deal with these contextual influences?
8. Closing Questions	- Do you have any suggestions for improving this topic guide? - Do you know other people we could interview, such as members of improvement networks?

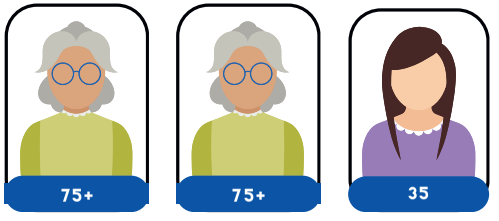
Appendices Chapter 5

- All character cards
- Iterations of the game

CLINICAL MANAGER I HOSPITAL

HELP THE NETWORK TO GET THE RIGHT PATIENTS AND EQUIPMENT TO THE RIGHT PLACE!
DUE TO AN INCREASING DEMAND FOR HEALTHCARE, THE REGION IS ON THE BRINK OF A HEALTHCARE CRISIS. HEALTHCARE PROVIDERS ARE STRUGGLING TO COPE, WITH PATIENTS ENDING UP AT THE WRONG LOCATIONS AND CRITICAL EQUIPMENT UNAVAILABLE WHERE IT'S NEEDED MOST. THROUGH COLLABORATION, THEY AIM TO PREVENT A TOTAL BREAKDOWN IN CARE.
IN GENERAL PRACTICES, THERE IS A SIGNIFICANT SHORTAGE OF IV'S, SO ANY DEVICE IN THIS CONTEXT CAN SERVE AS AN IV.

TARGET:



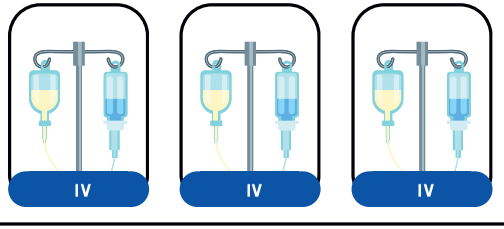
RULES: AS A MANAGER, YOU ARE ONLY ALLOWED TO COMMUNICATE AND TRADE WITH

- YOUR CLINICAL TECHNICIAN
- THE TECHNICIAN OF THE MIDWIFERY PRACTICE

CLINICAL TECHNICIAN I HOSPITAL

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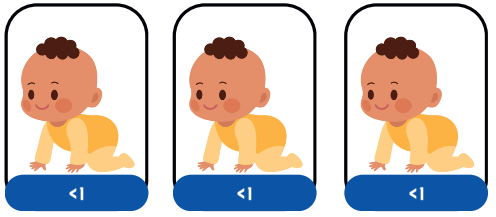
RULES: AS A TECHNICIAN, YOU ARE ONLY ALLOWED TO COMMUNICATE AND TRADE WITH

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CLINICAL MANAGER I MIDWIFERY PRACTICE

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THROUGH COLLABORATION, THEY AIM TO PREVENT A TOTAL BREAKDOWN IN CARE.
IN THE HOSPITAL, IV'S ARE NO LONGER NECESSARY IF CT SCANS ARE AVAILABLE.

TARGET:



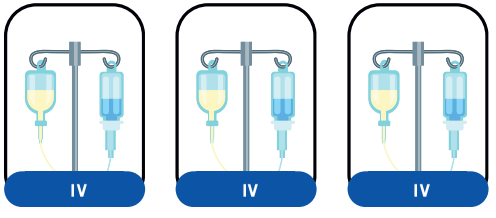
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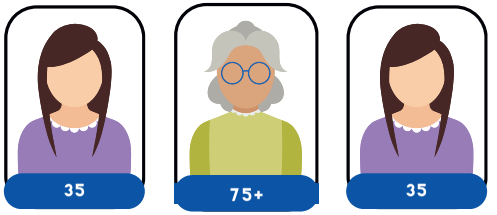
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THROUGH COLLABORATION, THEY AIM TO PREVENT A TOTAL BREAKDOWN IN CARE.
IN THE MIDWIFERY PRACTICE IT IS POSSIBLE TO USE TELEMONITORING INSTEAD OF ADMINISTERING AN IV.

TARGET:



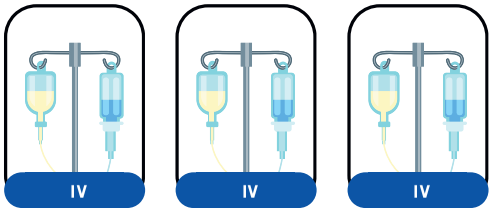
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CLINICAL TECHNICIAN I GENERAL PRACTIE

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Appendix B Itenations	Phase	Date	Group size	Aim	Setting	With whom?	Moderator(s)	Version	Type	Input / feedback	Development and improvement game elements based on input and feedback
		10-4-2025	3	Identifying game elements	Brainstorm	MR + AC + RM	X	x		• Aim is to experience how brokerage behaviour enhance knowledge exhange via a serous game • More focus on brokerage behaviour compared to brokerage position • Game elements: actions & compentences of the five brokerage rdies • Game element: knowledge exchange via reviewing and translating information • Important to incorporate reflection on from whom you get resouces and to whom you give resources • Incorporating differences between organizations	• Players need to be busy with their own thing and do not have a focus on from whom to gather the correct resources • Each organization has its own assignment!! • Plaes only see what is possible to collect when information fits, if not they dont see it.
	Brainstorming										
		19-4-2025	2	Developing network structure	Brainstorm	MR + RM	MR	x		• Network and network structure need to be more visible • We play only with the Coordinator, Gatekeeper, and Representative • Activities: supporting and distracting activities	• Three organizations each with three players • Each organization has its own assignment • Each player has six different resources (3 animals , 3 forms of equipement), a card with game information and one assignment • At the beginning it is unclear what the specific roles are within the organizations • Players have information on their cards that is not applicable to their own assignment but for others within the network • Players have rules with whom they can communicate with, leading to indirect and direct communication within the network • Players learn by the information of other organizations which information they need and which resources to fulfill their assignment
		25-4-2025	2	Developing network structure	Brainstorm	MR + AC	MR	x x			
		6-5-2025	4	Try-out meeting	Prototyping	MR + AC + RM + AW + LO + IB	MR	1.0	Low fidelity	• Remain stories but need these to translate to health care context	• MR translated in health care context
	Prototyping										
		22-5-2025	6	Try-out meeting	Prototyping	Colleagues	MR + AC	2.0	Low fidelity	None	• MR designed a more engaging lay-out • MR improved text based on textual suggestions from RM + AW + AC • MR changed one of the resource blood pressure monitor into Telemonitoring as suggested by AC • MR developed a PowerPoint with a short introduction and reflection on how there behavior can be described by the five brokerage roles
		30-5-2024	54	Testing the game	Networkmeeting	anonymous	MR	3.1	High fidelity	• Not logical that the midwife practice need to collect elderly baby's in general practice • It remains a bit unclear that everyone has a piece of the puzzle • It is better to reflect within the group that played the games instead of plenairy	• AC translated the cards into English and changed that the midwife practice need to collect baby's and not elderly. So, it is more logically.
		20-6-2024	5	Testing the game	Prototyping	anonymous	AC	3.2	Low fidelity	• Need better moderation such as setting a time limit and developing a moderator guide	• MR improved english text from version 3.2 • MR put version 3.2. in the same engaging lay-out as version 3.1 • MR + AC developed moderator PowerPoint in which reflection on the theory of boundary spanning was added
		9-8-2024	24	Testing the game	International Management Conference	anonymous	AC + MR + RM + AW	4.0	High fidelity	• More improvement is required for the moderation of the game	• AC improved moderator PowerPoint by using visuals from the card on the slides and marked the specific elements on these cards
	Test	27-8-2024	12	Testing the game	Research Institute studying networks	anonymous	AC + MR	4.1	High fidelity		
		26-9-2024	82	Testing the game	National Health Care Conference	anonymous	AC + MR + AW	4.2	High fidelity		• MR + AC improved and personalized moderator PowerPoint for new conference.
		7-11-2025	18	Testing the game	Networkmeeting	anonymous	AC	4.2	High fidelity		• AC personalized moderator PowerPoint towards eHealth Junior Network session
		11-12-2024	35	Testing the game	Master students	anonymous	MR	4.2	High fidelity		
		9-4-2025	15	Testing the game	Conference (1)	anonymous	MR	4.2	High fidelity		
		9-4-2025	15	Testing the game	Conference (2)	anonymous	MR	4.2	High fidelity		
		15-5-2025	60	Testing the game	Networkmeeting	anonymous	MR	4.2	High fidelity		
		24-6-2025	14	Testing the game	Networkmeeting	anonymous	MR	4.2	High fidelity		
		1-10-2025	54	Testing the game	Conference	anonymous	MR	4.2	High fidelity		

Dankwoord

Dan opeens is het af… Er schiet (tot mijn grote teleurstelling) geen confetti uit het beeldscherm van mijn laptop wanneer ik op “upload manuscript” klik. Het besef dat mijn proefschrift daadwerkelijk is afgerond, dringt pas langzaam tot me door wanneer ik het goede nieuws deel met iedereen die met mij heeft meegeleefd. De afgelopen vijf jaar waren een bijzondere reis waarin ik veel heb geleerd over de zorg, over mensen in de zorg, over onderzoek en over mezelf. Het is vooral een reis die ik niet alleen heb afgelegd. Daarom neem ik graag de ruimte om iedereen persoonlijk te bedanken die hierin veel voor mij heeft betekend.

Allereerst wil ik mijn promotieteam bedanken, Anne Marie, Leon en Remco, die dit traject tot een feest hebben gemaakt. Onze teams-sessies bestonden altijd uit een mooie mix van inhoud en vermakelijke anekdotes. Ik wil jullie bedanken voor het creëren van een veilige omgeving, waarin ik ideeën kon toetsen en waarin feedback als bijsturing voelde in plaats van falen.

Anne Marie, ik ontmoette jou in het eerste jaar van mijn PhD-traject en wist toen nog niet zo goed wat ik van de ‘nieuwe’ hoogleraar kon verwachten. Vol enthousiasme pitchte ik mijn ideeën voor de hoofdstukken van mijn proefschrift. Tot mijn verbazing wilde je eerst weten wie ík was. Je bent ontzettend begaan met jouw PhD studenten, weet wat er speelt en laat zien hoe je een PhD niet alleen inhoudelijk kan begeleiden, maar ook ruimte kunt geven aan de persoon. Ik heb onwijs genoten van al onze sparringsessies aan de telefoon maar ook reisjes naar oa. Kopenhagen, Chicago en de vele Fletcher hotels. Je kan zo in de serie ‘Extreme Couponing’ met alle social deal bonnen! Je hebt mijn ondernemingsdrang altijd gestimuleerd en actief meegedacht hoe we dingen verder kunnen brengen. Dat is precies wat ik nodig had en daarvoor ben ik je enorm dankbaar. Je inspireert mij dagelijks, zowel in onderzoek als in de praktijk. Ik hoop dat we in de toekomst nog veel samen mogen onderzoeken, schrijven, reizen en ondernemen.

Leon, toen ik nét begonnen was aan mijn PhD en nog niet wist wat de focus van mijn onderzoek zou worden, kwam ik bij jou op kantoor. Een koffieafspraak met jou opende mijn ogen voor de wereld van netwerktheorie, en vanaf dat moment kon ik mijn proefschrift en netwerken niet meer los van elkaar zien. Tijdens onze vergaderingen ben je altijd vrolijk gemutst (ook al zou jij jezelf misschien niet zo omschrijven), met hier en daar de nodige kritiek op de bureaucratie (van alles eigenlijk..). Jouw “two cents” hebben keer op keer hun waarde bewezen en ik ben blij dat ik onderdeel mag zijn van jouw laatste jaren aan de universiteit. Gelukkig blijf jij je nog vele jaren inzetten voor gelijkheid in de regio als ware idealist. Bedankt voor alles.

Remco, om meer te leren over netwerken mocht ik weer even terug de schoolbanken in. Tijdens de bachelor course en research master die ik samen met mijn maatje Aafke heb gevolgd, leerden wij elkaar kennen. Jouw kennis van de netwerk literatuur en je enthousiaste houding paste perfect bij mijn promotieteam, en ik ben erg blij dat je die plek hebt geaccepteerd. Je levert altijd een uitgebreide en zeer scherpe bijdrage op mijn stukken, en dat op een bescheiden en vriendelijke manier. Een absoluut hoogtepunt was natuurlijk onze reis naar Chicago, waar wij

niet alleen onze serious game mochten presenteren maar ook een mooie boottocht hebben gemaakt, met mooie gesprekken en een vuurwerkshow! Ook dat is promoveren. Jij benoemt altijd wat juist de leuke kant is van onderzoek en dat straal je ook uit. Ik hoop dat je vandaag een pak hebt kunnen vinden dat matcht bij mijn boek, met al deze kleuren heb ik het je niet makkelijk gemaakt. Dankjewel voor jouw prettige begeleiding.

Aafke, wat had ik toch zonder jou gemoeten in Tilburg. Samen begonnen we aan dit avontuur, in/tijdens/na covid, allebei vol verwachtingen, dromen en ambities. We hebben elkaar aangestoken om vakken te volgen van Organisation Studies en raakten zo allebei betoverd door de wonderlijke wereld van netwerken. Jouw onuitputtelijke positiviteit is bijzonder en aanstekelijk. Je grappen en grollen haalden de scherpe randjes van het doen van onderzoek af, waardoor ik altijd met veel plezier naar Tilburg reed om samen te werken. Gelukkig was het niet alleen maar werk: we hebben ook veel plezier beleefd op de heidagen bij Eigentijdserf, tijdens 'wie is de rat', tijdens de mediacursus, de meerdere Serious Games, uiteten in de trein in Tilburg en natuurlijk in Chicago. Daar kwam jouw toetjesverslaving goed van pas bij het pannenkoeken ontbijt :P Bedankt voor de energie die je mij hebt gegeven en ik ben ontzettend blij dat jij als paranimf naast mij staat tijdens dit laatste stukje van ons avontuur. Hopelijk volgen er nog veel meer!

Tamara, mijn Amsterdamse buurvrouw en schrijfmaatje. Wat ben ik blij dat Anne Marie ons aan elkaar heeft gekoppeld, dat had ze goed gezien. Niet alleen is het fijn om een partner in crime te hebben die ook nog eens om de hoek woont, we hebben elkaar ook gevonden in onze liefde voor lekkere koffietentjes, goede eetplekken, borrels en feestjes. Onze schrijfmomenten bestonden grotendeels uit levensupdates en een beetje geklaag, maar toch waren ze precies de stok achter de deur die ik nodig had om meters te maken voor mijn proefschrift. Ik kijk uit naar de mooie plekken die we nog gaan bezoeken om te 'schrijven' aan een mooi volgend artikel of om te brainstormen over nieuwe businessmodellen. Je bent altijd in voor een nieuw avontuur, zegt eigenlijk overal JA op en kan heerlijke debatteren. Bedankt voor alle koffie en gezelligheid, ik kom snel een kopje suiker bij je lenen.

Ik wil natuurlijk ook alle **STZ collega's** bedanken, waaronder Danique en Paul voor de steun en het vertrouwen in mijn onderzoek maar ook Carla, Sabine, Sandra, Pip, Aniek, Wieke, Valerie, Joep en Ilon natuurlijk. Ik heb onwijs genoten van de wandelingen, de uitgebreide lunch op het kantoor en borrels. Ook de collega's die zijn afgezwaaid waaronder Jan, Hedwig, Maartje, Sabrina, Hans en Fenna. Bedankt dat jullie een warm bad waren voor mijn start als PhD student.

Dan ons **schrijversclubbie**! Of moet ik jullie het Fletcher Stimuleringsfonds noemen? Lieve Ada, Judith, Gijs, Ylonne, Catharina, Tamara, Bregje, Annet, Kirsten, Suus, Neeltje, Marielle, Jacqueline, Claire en Mildred: wat hebben ik genoten van de stoffige werktruimtes, doorloop koffie, Fletcher burgers en wandeltochten in de omgeving. Van de 110 locaties hebben we er toch al circa 6 bezocht. En ik heb hier toch 3 hoofdstukken afgeschreven. Dus ook dank aan **Fletcher Hotels** voor het creëren van de voorzieningen die mijn schrijversknobbel hebben geactiveerd.

Hopelijk reageren jullie ooit nog op het business idee dat Tamara en ik meermaals hebben gemaild. Ik zie hier kansen!

Mijn woensdag collega's Henri, Mayke en Vera wil ik ook bedanken voor de leuke start van mijn PhD en de woensdagen in Tilburg met leuke anekdotes uit het ziekenhuis, maar ook de leuke heidagen natuurlijk! We zijn haast samen aan dit traject gestart en jullie voelen dan ook als mijn **Tranzo** familie. Mijn 'kamergenoten' Rikste en Fieke, als ik dan weer eens in Tilburg was heb ik leuk met jullie bij gekletst en gewandeld. En natuurlijk de rest van mijn werkplaats Toekomstbestendige Gezondheidszorg. Ik heb altijd enorm genoten van de werkplaatsmiddagen met leuke opdrachten en mooie gesprekken. Ik heb mij hier altijd erg op mijn plek gevoeld.

De Health Hub 2.0 / Healthcare Networks Research club / **Netwerk van netwerk onderzoekers**; welke titel wij dragen blijft even onduidelijk maar het is een netwerk waar ik graag bij aansluit en waar ik veel aan heb gehad. Zowel de fysieke als digitale sessies zijn altijd zeer informaties en inspirerend geweest en het is fijn om verschillende perspectieven met dezelfde netwerk kennis samen te zien komen in deze groep. Aafke, Nick, Robin, Roos, Oemar, Thomas, Jolanda, Galina, en iedereen die eens is aangeschoven, bedankt voor de mooie gesprekken en hopelijk komt er nog een mooie position paper waarin al onze netwerk kennis is gebundeld.

De **Amsterdamse** vriendinnen die ik in het bijzonder wil bedanken zijn allereerst Pam en Marjolein, met wie de eerste stappen in het onderzoek is begonnen (heerlijk in Frankrijk). Daarnaast Julie, je weet als geen ander hoe frustrerend onderzoek kan zijn en vooral het aanvragen van subsidie aanvragen. Genoten van al onze koffietjes en klaagsessies. Ook Wietske, mijn buufie!, wat was het heerlijk om af en toe even een wandeling met een koffietje te maken, dank voor alle steun en betrokkenheid. Es en San, jullie waren ook een steun en toeverlaat de afgelopen jaren en altijd super geïnteresseerd. Dank voor onze bijzondere vriendschap. Ook jij Door, als trotse vriendin stond je altijd klaar met een flesje bubbels om een stukje van de afronding te vieren. Bedankt voor de oneindige support!

Lieve **Pap**, **Mam** en **Boris**. Al vanaf jongs af aan wordt er aan de eettafel gediscussieerd over de zorg en we waren het eigenlijk nooit met elkaar eens…. We hebben allemaal een eigen mening, perspectief, achtergrond en zijn daarbij ook nog eens koppig (*ik het minst). Een recept voor reuring kan je wel stellen. We bespraken de bureaucratie in de zorg, de prijzen voor behandelingen en de (beperkte) samenwerkingen tussen de apotheker en arts en de bedrijfsvoering. Jonge Manon vond dit maar al te leuk en leerzaam. Ik heb geleerd om kansen te zien, out-of-the-box te denken, naar mensen te luisteren, voor mezelf op te komen, te genieten, iets te proberen, lastige zaken te incasseren maar ik heb vooral geleerd om te dromen. Dat dromen kon door jullie drie, als veilige haven, en daardoor heb ik al veel moois mogen beleven. Ik kan jullie niet genoeg uitleggen hoe veel steun en liefde ik voel. Bedankt voor alles en ik ga jullie straks een enorm dikke knuffel geven (knijpen!)

Bushki… lieve **Wouter**, ik ben normaal zo goed met woorden maar die schieten tekort nu ik je daarmee wil bedanken. Ik prijs mij onwijs gelukkig met jou aan mijn zijde, wij zijn één team! Je

kan zo enthousiast vertellen over mijn onderzoek, staat achter mijn dromen en geeft mij onvoorwaardelijk vertrouwen in de plannen en ideeën die ik wil uitwerken. Tegelijkertijd ben je ook kritisch en stel je de juiste vragen om samen te bepalen wat de juiste weg is. Ook ben je er voor me als het allemaal even te veel is en kan je mij als geen ander geruststellen. Dat maakt jou mijn trotse supporter, mijn klankbord en mijn rots in de branding. Maar bovenal ben je mijn grappenmaker. Op elk moment van de dag tover je een lach op mijn gezicht en je bedenkt de gekste persiflages. Ik kijk uit naar alle avonturen die nog gaan komen samen, I Got You en we gaan samen 200% genieten.

Dick… wat vind ik het jammer dat je dit niet meer mee kan maken. Ik weet dat je trots bent en ik mis onze gesprekken.

Output en impact

Serious Game sessies

2024	STZ Regiobijeenkomst Innovatie netwerk & Wetenschap netwerk en subsidie netwerk (30)
2024	AoM Chicago
2024	Serious game Vilans (12 deelnemers)
2024	Studenten Maastricht University (LIME)
2025	NVKI (2x15 deelnemers)
2025	Netwerk Café XL Hogeschool Leiden (60 deelnemers)
2025	REN; Regionaal Elektronisch Netwerk (±16 deelnemers)
2025	Tijd voor Verbinding – programma afsluiting (80 deelnemers)
2025	TOP-GGZ congres (2x27 deelnemers)
2025	Tranzo Lustrum (30 deelnemers)
2026	Salland United (18 deelnemers)
2026	Masterclass Samenwerkende Algemene Ziekenhuizen

Presentaties

2023	VEC (verpleegkundig expertise centra UMCG): samenwerken in netwerken
2023	Inspiratiediner STZ: Hoe versnellen we zorgtransformatie door inzetten van netwerken?
2023	Stichting Medical Business: zorgtransformatie
2023	STZ Connect event: hoe werken we samen in netwerken; het belang van netwerken voor innovatie en aanzwengelen van zorgtransformatie
2023	Kennisproeverij Anne Marie oratie: The Network Farm
2024	NEVI zorgcongres: Verspreiden van innovaties en innovatiekennis
2024	STZ Decanen netwerk kick-off
2024	STZ HR managers netwerk kick-off
2024	Zorg&ICT Congres Scale-up the future: Innovatie en Opschaling in de praktijk (STZ)
2024	Amsterdam Economic Board: eigenaarschap beleggen in een netwerk, welke rol pak je?
2025	Kick-off transmuraal centrum UMCU
2025	Tranzo Lustrum: longitudinaal onderzoek zorgtransformatie

Congressen

2024	Organizational Behavior in Healthcare (OBHC) Oslo – Paper: relevance of brokerage behavior for effective knowledge exchange and innovation dissemination in a healthcare innovation network
2024	Academy of Management (AoM) Chicago – PDW Workshop A Serious Game: Collaborating in a Healthcare Innovation Network
2025	International Forum on Quality & Safety in Healthcare (IHI) Utrecht – Paper: strategies for maintaining long-term commitment in healthcare networks

2025 Academy of Management (AoM) Copenhagen – PDW Workshop: Studying healthcare transformation: Longitudinal methodologies for complex changes

Onderwijs en begeleiding

2025 *Teacher Award* - Relations and Networks of Organizations (RANO) College innovatie en netwerken (brokerage) – bachelor Organisation Studies

2022 Discipline Overstijgen Onderwijs voor Artsen in Opleiding Erasmus Universiteit - Netwerkzorg

2023 Masterthesis / stage Nienke Elferink: Implementing centralized telemonitoring. Healthcare Management, Erasmus Universiteit

2024 Masterthesis / stage Vlada Pavlenko: Paradoxen in samenwerken in zorgnetwerken

2024 Masterthesis Gijs Magnani: Identifying and Combatting Medication Waste Streams in Long-Term Care Facilities. Master Sustainable Entrepreneurship Rijks Universiteit Groningen.

2025 Masterthesis Joerie Mulder: Verzekerd van innovatie? Een exploratief onderzoek naar de bijdrage van zorgverzekeraars aan innovatie. Master of Health Business Administration, Erasmus Universiteit

2025 Masterthesis Lianne Boersma: Absorptievermogen van GGZ-organisaties; Perspectief en rol van bestuurders. Master of Health Business Administration, Erasmus Universiteit.

2025 Masterthesis Lois van der Wijst: Reducing medication waste in long-term care facilities. Analysing the role of prescribing behaviour of healthcare professionals. Athena Institute. Vrije Universiteit van Amsterdam.

gevolgd

2021 Qualitative Research Techniques – Graduate School TiU

2022 Designing, Implementing and Evaluating Organizational Interventions. – NIVA (Ijsland)

2022 Mastermodule Organisational design – SUAS

2022 Bachelor (course): Relations and networks of organizations. Department of Organization Studies (TSB) TiU.

2023 Research Master (course) in Social and Behavioral Sciences. Organizational Networks. Department of Organization Studies (TSB) TiU.

2024 Mindfulness course – Graduate School TiU

2025 BKO introductie course Supervising skills & Teaching Skills – Graduate School TiU

Overige output

2022 ICT&health: Mijn wiel is ronder dan jouw wiel

2022 ICT&health: Airbnb: hoe word je een Superhost in de zorg?

2022 ICT&health: Help, word ik een digitale dokter?

2022 ICT&health: Onderzoek & Innovatie – Zachte heelmeesters

2022 ICT&health: Onderzoek & Innovatie – Innovaties opschalen, welk model volgen we?

2022 ICT&health: Zorgorganisaties worstelen met succesvol toepassen innovaties

2022 ICT&health: 'Domeinoverstijgend denken past niet in ons organogram'

2023	Kennissynthese Netwerken en Samenwerking voor het verbeteren van patiëntveiligheid (Tijd voor Verbinding)
2023	Kennissynthese Netwerken voor zorgverbetering Helpende en belemmerende factoren in het teweegbrengen van verbetering in de zorg in een netwerk (Tijd voor Verbinding)
2025	Nieuwsbrief Zorg en Innovatie - Het is essentieel dat leden van zorgnetwerken langdurig gemotiveerd en actief betrokken blijven: hoe doe je dat?
2025	Nieuwsbrief Zorg en Innovatie - Telemonitoring: kiezen tussen centraal en decentraal

About the Author



Manon Jacqueline Roest (1995) obtained her Master's degree in Medicine from Vrije Universiteit Amsterdam. Her PhD research, conducted at Tranzo, Tilburg University, focuses on transforming healthcare through collaboration in inter-organizational networks, examining how the behavior of actors within such networks shapes and enables healthcare transformation.

This dissertation adopts a qualitative, multidisciplinary approach — drawing on healthcare management and network theory — to understand why and how actors collaborate in networks, and how such collaboration contributes to healthcare transformation. Themes addressed include healthcare innovation, inter-organizational networks, and organizational behavior. Her work aims to generate practice-oriented insights that bridge academic knowledge and real-world application.

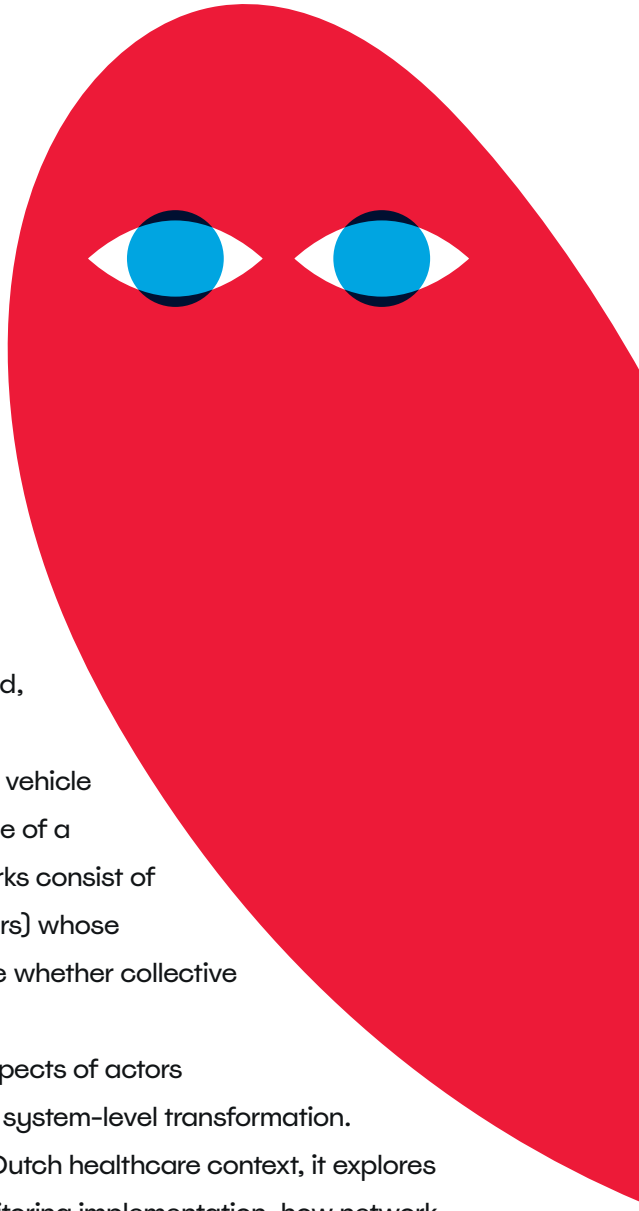
Over the course of her PhD, Manon has published in peer-reviewed journals and presented her research at international conferences, including the Academy of Management (2024 & 2025) and the International Forum on Quality & Safety in Healthcare (2025).

Manon's career has been marked by an early and consistent drive toward innovation. From being among the first Airbnb hosts in Amsterdam to designing care pathways at one of the Netherlands' first remote cardiac monitoring centers, she has affinity for new models of service and value creation. After developing a digital general practitioner concept for a major health insurer and launching a high-end healthcare service for luxury hotels in Amsterdam, she started Stichting Repharmable. This is a foundation dedicated to sustainable medication use in long-term care facilities, with the ambition to transform the pharmaceutical supply chain toward more circular and responsible practices.

Beyond her research, Manon is actively engaged in several collaborative networks at the intersection of healthcare and broader social impact. She has participated in the Young on Board (Amsterdam Economic Board) to advance prosperity in the Amsterdam Metropolitan Region. Currently she is part of the Jonge Zorg Gezanten, a group of young ambassadors working toward a future-proof healthcare system.

TRANSFORMING HEALTHCARE TOGETHER

Behavioral aspects in inter-organizational networks



Healthcare systems face multiple pressures including an ageing populations, rising costs, and workforce shortages. Addressing these challenges requires more than efficiency measures – it demands fundamental change in how care is organized, delivered, and financed. Inter-organizational healthcare networks have emerged as a key vehicle for this transformation. Yet the mere presence of a network does not guarantee change. Networks consist of actors (i.e. clinicians, managers, policymakers) whose actions and interactions ultimately determine whether collective ambitions are realized.

This dissertation examines the behavioral aspects of actors collaborating in healthcare networks toward system-level transformation. Through empirical studies conducted in the Dutch healthcare context, it explores how professionals' decisions shape telemonitoring implementation, how network commitment can be sustained over time, and how certain individuals bridge organizational boundaries to spread innovations. It also introduces a serious game designed to bring these insights into practice.

Manon Jacqueline Roest (1995) obtained her medical degree from the Vrije Universiteit Amsterdam and subsequently joined Tranzo, Tilburg University as a PhD candidate to study healthcare transformation.