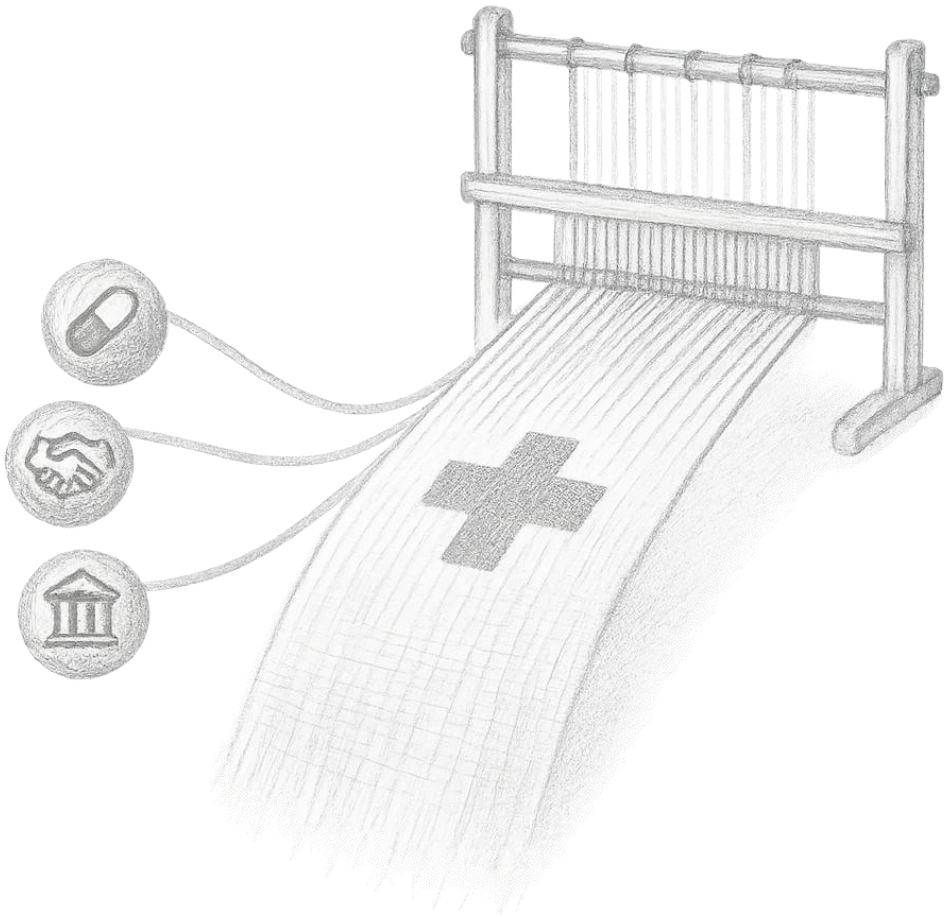
Transforming healthcare practice

Integrating praxeological and socio-technical perspectives on social change



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Executive summary

This thesis develops and tests a framework that connects micro-level changes in "*the things people do"* during healthcare service provision with a system-level account of transformative change situated within the system's organisational and institutional affordances. It builds on an understanding of healthcare practices as co-produced encounters between healthcare professionals and patients, which depend on material and immaterial structures to enable these interactions. Departing from the premise that these interactions are the relevant unit of analysis for understanding healthcare innovation, the thesis traces how actors realign service elements to produce feasible alternative practices and how these practices then acquire legitimacy and become institutionalised on system-level. As such, the thesis contributes to our understanding of transformative change in (public) services.

In the first part, the thesis introduces the background, stressing that advancing this understanding in the context of healthcare is urgent. Europe is ageing – one fifth of the population is above sixty-five years old. At the same time, the healthcare workforce is ageing and thinning as well. Estimates from the WHO point to a shortage of hundreds of thousands of physicians and millions of nurses and other professionals in the next years. These shortages meet an epidemiological transition, that is characterised by the rise of non-communicable diseases that require specialised medical services over an extended period, which are service characteristics the system's structures have not been designed for. Innovation is often proposed as a response to these challenges; however, healthcare innovations often fail with only one in seven evidence-based interventions ever being implemented. Thus, healthcare systems face wicked problems, where ageing, chronicity, workforce shortages and fiscal pressures interact with fragmented structures and inefficient innovation models.

The thesis responds to this persistent puzzle, by asking how feasibility is achieved in healthcare practice innovations, how legitimacy for new approaches is built in the field, and how actors create opportunities for such change under structural constraints. Thus, the thesis is a process study focusing on the adoption of technological and non-technological innovations into routinised practice of healthcare professionals and patients. Theoretically, the thesis builds on praxeological and socio-technical approaches and uses institutional theory to bridge conflicting ontologies between these two pillars. The resulting cross-over framework is deployed to study cases of emerging healthcare innovations focusing on service innovations for non-communicable diseases at the regional level. This design allows the analysis of the interrelated dynamics between adjustments in work routines and processes of altering the affording organisational and institutional arrangements.

It introduces a conceptual framework that lays the foundation for such a cross-over framework to explain how micro-level changes in routinised healthcare work can accumulate into field- and system-level transformation. This framework conceptualises the healthcare system as an organisational field structured by multiple and sometimes competing logics and technologies. Within this field, healthcare services are understood as practice–arrangement bundles composed of activities, understandings, and materialities that co-evolve with institutional orders and technologies. In a structured field like healthcare, changes in these practice–arrangement bundles depend on the agency of embedded actors whose institutional work creates, maintains, or disrupts services. Subsequently, transformation is theorised as a dynamic, path-dependent process driven by the institutionalisation of new practices, the de-institutionalisation of some existing practices, and the reconfiguration of the totality of practices. It links changes in work routines to shifts in field logics and coherence, which is mediated by questions of feasibility of work and legitimacy within evidence- and regulatory regimes.

In the second part of this thesis, its three constitutive papers are presented. The *Open and Responsible* paper shows that feasibility is a characteristic of a practice bundle that needs to be co-produced in-situ. The paper conceptualises healthcare services as practice bundles and, based on the Responsible Research and Innovation-inspired policy experiments in two regions, argues that innovations become feasible when these elements are aligned-in-use. The experiment design allowed the bottom-up problematisation and subsequent introduction of solutions, which made potential misalignments visible and allowed addressing them during the co-creation process. Across cases, this co-creation process fostered local feasibility by coupling technological, organisational, and institutional change. However, the paper also shows that local feasibility does not guarantee uptake, which would require legitimacy work and institutional embedding beyond pilots. As such, the paper contributes a practice-theoretical account of feasibility and a pragmatic RRI-based process model that helps regions orchestrate coalition-building, requirement articulation, and iterative adjustment as precursors to field-level institutionalisation.

The *Bits or Bricks* paper picks up on these results and investigates the role of technological, organisational, and institutional concepts for establishing legitimacy. It compares the generalisation process of two diabetes care trajectories across their phases of emergence, implementation, and reconfiguration. In one case, the introduction of a novel technological concept demonstrates value and patient motivation while being unable to institutionalise a compatible organisational concept, illustrating that feasibility without affording field-level structures stalls diffusion. The other case shows how a new organisational concept yielding robust feasibility and early replication yet still hinges on legal reforms for full institutionalisation. The paper contributes with specifying the relation between feasibility and legitimacy, as innovations scale when practice bundles

are aligned in use and their underpinning concepts are institutionalised in the field. In absence of this sedimentation, promising pilots remain local solutions.

The third paper, *Talking about practice*, explains how actors create, perceive, and act upon opportunities for transformative change by widening regional opportunity spaces and steering selection environments so that certain practice bundles get selected and hence become scaled. Drawing on two comparative regional cases, the paper traces the role of intermediaries, that orchestrate heterogeneous stakeholders through networked governance, curate niches for experimentation, and widen the regional opportunity space by shifting system selectivities. Their work translates needs into candidate technological, organisational, and institutional concepts, brokers alignment across communities, and supports first- and second-order learning, thereby connecting feasible local bundles with field-level legitimacy efforts. While such intermediation expands plurality and seeds developmental change, generalisation still hinges on institutional work to overcome regime inertia to convert feasible pilots into recognised configurations at scale.

Based on the empirical results, in the third part the thesis argues that within a mature field like healthcare, innovation disrupts established practice bundles and produces misalignments that need to be overcome during adoption processes. Yet the development of alternative bundles also expands what the actors in the field can plausibly recognise as a workable approach, the thesis labels this condition configurational pluralism. It entails that alongside stabilised and institutionalised ways of doing things, alternative conceptualisations exist as less-institutionalised possibilities. These alternatives can be rendered feasible and legitimate as a basis for reconfiguring prevailing practices, which involves selecting elements that add specific value and integrating them into daily operations. Through such an alignment, the feasibility of a practice is demonstrated, which however is not enough for sustainable implementation and generalisation beyond the site of emergence. Ultimately, the question which practice elements are selected and aligned into feasible practices comes down to the legitimacy these elements and bundles have within the field and for practitioners.

To understand these selection processes based on the institutionalisation of certain logics, the thesis introduces technological, organisational, and institutional concepts as a meso-level vocabulary that links changes in practice bundles to field processes. These concepts, thus, are field-level logics that structure the alignment of practice elements into legitimate bundles. These concepts provide logics on how technological components can be mobilised, how work should be organised, and which elements are appropriate and included in regulatory frameworks. These concepts do not exist in isolation but are interconnected and co-evolve and, thus, form configurations that afford certain practices. To become a standard practice bundle that is routinely performed across sites, its affording technological, organisational, and institutional concepts must be institutionalised in the field, e.g., sedimented in attitudes, guidelines or other regulatory elements. Under the conditions of configurational pluralism, these concepts

compete for generalisation within practice configurations. The benefit of this vocabulary is that it provides an explanatory arc that follows an innovation from emergence, through implementation, to reconfiguration on field-level while neither losing the role of practitioners nor the breadth of structural transformation.

With this perspective, the thesis contributes theoretically to the emerging literature of cross-over frameworks, combining praxeological and socio-technical theories. The framework keeps the practice bundles as the primary unit of analysis while introducing a meso-vocabulary of technological, organisational, and institutional concepts that link practice changes to field-level dynamics. This allows explaining change through configurational pluralism showing how competing concepts are selected, aligned to achieve feasibility, and institutionalised to accrue legitimacy, thereby addressing the critique that transition studies are overly abstract and that practice theory lacks power to explain system transformation. This, further, allows to restate niche, regime, and landscape as relational practice arrangement bundles of varying institutionalisation, as well as integrating transition pathways as interactions of endogenous institutional work and exogenous pressures that allows innovation to travel via events and chains of activity. Collectively, the elements of this framework provide a grammar for tracing how micro-level routines and field-level structures co-evolve during the emergence, implementation, and generalisation of healthcare practices.

Practically, the thesis reframes innovation in healthcare as configuration-building, arguing for policies that explicitly support the transformation of technological, organisational, and institutional concepts through a coupled experimental alignment of practice elements with deliberate field-level legitimacy work. It specifies that transformative healthcare policy requires a renewed focus on stewardship, combining strategic problem framing and vision setting with programmatic portfolio design and niche protection, with operational in-situ co-creation and learning, and with reflexive formative evaluation and evidence curation, to steer practice change under the pressures of non-communicable diseases. Finally, it foregrounds the role of embedded intermediaries with networked governance capacity to orchestrate across epistemic and organisational boundaries.

Taken together, the thesis shows that transformative change in healthcare is achieved when actors configure workable practices and legitimise them, so that structures accredit and afford them. By centring practice bundles and tracing how technological, organisational, and institutional concepts are selected and aligned into feasible configurations, it explains why many innovations stall and what must be done for them to generalise. Under conditions of configurational pluralism, progress depends on making alternatives visible and pairing them with institution-building. The framework therefore offers both an explanation of how local change becomes system change and a practical agenda for those who must govern it.

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Corrections asked by the jury

The only correction the jury members asked, is to include the supplement data that was prepared on basis of the single papers, as a general annex to the thesis. The data can be found here: https://doi.org/10.5281/zenodo.19251108

List of Abbreviations

ASVG	Allgemeines Sozialversicherungsgesetz
BEMS	Bimonthly Experiment Monitoring Sessions
CSO	Civil Society Organisations
CyRIC	Cyprus Research and Innovation Centre
EBM	Evidence-Based Medicine
EU	European Union
GP	General Practitioner
ICT	Information and Communication Technology
MLP	Multi-Level Perspective
NCD	Non-Communicable Diseases
NHS	National Healthcare System
OECD	Organisation for Economic Co-operation and Development
ÖGK	Österreichische Gesundheitskasse
PAR	Participatory Action Research
PSI	Partnership for Social Innovation
R&D	Research and Development
RRI	Responsible Research and Innovation
SMS	Servicio Murciano de Salud
SPT	Social Practice Theories
TBM	Ticbiomed
WGV	Wiener Gesundheitsverbund
WHO	World Health Organisation

"Social change is messy. Small changes always occur, large changes embrace and arise from myriad smaller ones, and the difference that any change makes to the world is open until the world responds." (Schatzki, 2011)

Part I



1. Introduction

This chapter introduces the healthcare sector and sets the stage for the thesis. It begins by outlining what healthcare systems are, who the key actors are, and how services are organised and financed. In the second section it then turns to current challenges, including demographic change, the rise of chronic conditions, workforce pressures, fragmentation, and fiscal constraints. The third section explains what is meant by innovation, with a focus on service and organisational change in healthcare and discusses why promising ideas often fail. The final section states the research problem addressed in the thesis, clarifies the conceptual orientation, and sets out the overall research objective. Thereby this chapter provides the context and rationale for the thesis.

1.1. Healthcare systems and their structure

The preamble of the World Health Organisation's (WHO) constitution defines health as: "*a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity*" (Grad, 2002: 4). Health is, therefore, both a resource and a condition that enables individuals and communities to live productive lives (Broerse & Grin, 2017). Healthcare systems are subsequently understood as *"all actors, institutions, and resources that undertake health actions"* (Murray & Evans, 2003: 7). In this definition healthcare systems include personal, non-personal healthcare services and inter-sectoral and systemic action that affect public health. Following Murray and Frenk (2000), personal healthcare services are consumed directly by an individual, whether they are preventive, diagnostic, therapeutic or rehabilitative while non-personal healthcare services include actions that are applied either to collectivities, like e.g., programmes to reduce obesity (Nobles et al., 2021), workplace health programmes (Vaandrager et al., 2017), or infrastructure like basic sanitation (Geels, 2006). These interdependencies foreground the need to think across sectors to capture co-benefits of health (Greer et al., 2023).

European healthcare systems grew out of Enlightenment ideals and nineteenth-century institution-building (van Raak & de Haan, 2017). This origin facilitated system dynamics around an understanding that quality of life and quality of care can be improved through scientific and technological advances, which lead to centralisation, specialisation, and

an increased reliance on technology. Following this trajectory, the current regime of healthcare systems has been shaped around the central institution of the modern biomedical paradigm, in which health and disease are (virtually exclusively) located in the (universal) body, and may be controlled by professional intervention (Ashcroft & Van Katwyk, 2016; Broerse & Grin, 2017; Farre & Rapley, 2017). It describes the scientific approach of healthcare professionals identifying the "cause", e.g., an alien organism, and taking clinical steps to remove or contain it (Plsek & Greenhalgh, 2001). This paradigm manifested in a socio-construct known as the Parsonian sick role (Parsons, 1975), which highlights the lack of patient agency in modern healthcare practice. Following this path, professional actors and supporting structures co-evolved into stable configurations: general practitioners (GPs) and specialists differentiated, and hospitals became central sites for specialised, technology-intensive, curative work (Broerse & Grin, 2017).

To provide these services, the WHO (Murray & Evans, 2003; Murray & Frenk, 2000) describes four functions of modern healthcare systems: financing, provision, stewardship, and resource generation. Stewardship ensures the system works effectively and efficiently. Resource generation safeguards the supply of inputs such as the workforce, facilities, and equipment. Financing raises and allocates funds, while provision describes the delivery of care. Together, these functions should contribute to the triple aim of enhancing patient experience, improving population health, and reducing costs of healthcare systems governance, which has been amended to the quadruple aim by Bodenheimer and Sinsky (2014) by including care for providers' health and work-life to reduce widespread burnout and dissatisfactions.

The implementation of healthcare services is a result of the interactions of various actors. Thus, provision rests on the interactions between patients and healthcare professionals like GPs, specialists, nursing, technicians, assistants and administrative staff (WHO, 2019) often supported by volunteers or community workers in informal settings (WHO, 2006). In the wider field, additional actors include those who produce inputs to healthcare services, including universities, research centres, and companies producing specific technologies such as pharmaceutical products, devices, and equipment (Murray & Frenk, 2000). While all these actors contribute to improve population health, they

represent different epistemic communities that operate under different, often conflicting, logics and attach different values to specific factors (Greenhalgh et al., 2018).

Given the diversity of actors, multi-scalar interdependencies and external social, economic and political influences, healthcare systems are "*complex adaptive systems*" (Barlow, 2016; Plsek & Greenhalgh, 2001; WHO, 2009). Actions by one actor alter contexts for others, triggering non-linear, sometimes unpredictable dynamics (Plsek & Greenhalgh, 2001; WHO, 2009). Uncertainty, emergence and self-organisation are inherent. Healthcare can thus be viewed as evolving sets of relationships and interactions that adapt through sensemaking and attention to interdependencies (Greenhalgh & Papoutsi, 2019). These relationships are stabilised and constrained by material and institutional structures, like the built environment, technologies, regulations, medical protocols, education systems etc. that enable the provision of the healthcare functions while providing legitimacy and meaning for all involved actors (van Raak & de Haan, 2017). In other words, the way healthcare professionals and patients interact in the provision of preventive, diagnostic, therapeutic, or rehabilitative healthcare services depends on the material and immaterial structures that are put in place to enable this interaction.

Historically, modern healthcare systems excelled at combating infectious disease and trauma. This success contributed to an epidemiological transition from high child mortality and infectious diseases to a higher prevalence of chronic and non-communicable diseases (NCDs), which now have become the leading cause of global deaths. The four major NCDs, namely cardiovascular disease, cancer, chronic respiratory disease, and diabetes, collectively caused around 33.3 million deaths in 2019 and are projected to account for over 90% of all deaths in regions like the Americas, Western Pacific, and Europe by 2048 (WHO, 2023). Managing NCDs requires long-term, often community-based care and a reconfiguration of roles across primary, secondary and tertiary settings to reduce avoidable use of costly specialist services. Yet the path-dependent organisational structures prioritise short encounters and hospital-centred specialisation.

1.2. Current challenges of the healthcare system

Healthcare systems face intensifying pressures that expose structural weaknesses and put current arrangements at risk. Demographic ageing and the rise of chronic conditions increase demand, while technological advances raise expectations and often add costs. These pressures collide with long-standing features of the sector such as fragmented delivery and financing, slow institutional processes, and limited capacity to adapt across organisations and professions. In the following these challenges are briefly introduced and discussed regarding the system's ability to respond effectively.

Demographic pressures and workforce shortages

Europe is ageing and, from 2029 onwards, an overall population decline is expected in many countries. Individuals aged 65+ already comprise roughly one fifth of the EU population today, which is projected to approach 30% by 2050, with rural regions particularly affected (EC, 2023). Even as healthy life years improve, the combination of rising NCD prevalence and long-term care results in increasing levels of old-age dependency and is met by a shrinking base of contributors to welfare systems and carers (Broerse & Grin, 2017; EC, 2023). Thus, fiscal pressure and resource conflicts are going to intensify in a situation where healthcare expenditure may approach one fifth of GDP in parts of the EU by 2040 (Barlow, 2016). Attempts to reduce waste, redesign services and adopt innovations often fail to deliver sustained cost control (Essink, 2012) and, unlike many sectors, novel technologies are associated with an increase in costs, as more cost-efficient services in the combination with rising demands just enables the provision of more care (Barlow, 2016).

With the general population aging, demographic change is also affecting the workforce of healthcare professionals, especially primary care incl. GPs (Russo et al., 2023), to the extent that the WHO estimates an overall shortage of 600,000 physicians, 2.3 million nurses and 1.3 million other healthcare professionals in Europe by 2030 (Zapata et al., 2023). This deficit of healthcare professionals is the result of supply and demand discrepancies, the COVID pandemic, and a lack of planning and forecasting. Before the pandemic, shortages of healthcare professionals already constrained European healthcare systems, but the COVID pandemic exacerbated the situation. Across Europe,

healthcare workers are feeling undervalued, overworked, and increasingly burnt out, which has negative effects on workforce retention. At the same time, in many European countries at least 40% of doctors are over the age of 55 and are expected to retire within the next decade, which underscores the urgent need for strategic planning and action to address workforce shortages and the well-being of healthcare professionals (Zapata et al., 2023).

Service fragmentation and evidence regimes

The sector's specialisation and compartmentalisation processes lead to a fragmentation that affects the healthcare system itself as well as the relation of healthcare and other societal systems, like e.g., the social welfare or education systems (Broerse & Grin, 2017; Hughes et al., 2020; Murray & Frenk, 2000). For complex, multimorbid cases, the sector's curative and linear design hampers continuity and inflates costs. NCD care requires interdisciplinary and integrated approaches that not only address physical but also psychological, social, and economic dimensions (Corbin & Strauss, 1988). In this sense, chronic diseases disrupt the curative imperatives that structure the sector (Green & Lynch, 2022). Thus, healthcare systems, remaining organised around curative and linear narratives, fail to manage chronic illness at the community level. Existing efforts to bridge these silos tend to add layers of coordination and complexity without resolving underlying misalignments (Lynch et al., 2022; Tzannis, 2013).

NCDs are complex pathologies that include aspects of lifestyles, life conditions, and psychological wellbeing, requires an active contribution of patients in managing the conditions. Addressing them requires approaches that might challenge conventional medical rationality. Thus, the shift towards NCDs led to the emergence of concepts like patient-centred care, self-management and empowering approaches (Corbin & Strauss, 1988; Hunt, 2015; Lorig & Holman, 2003; Morgan & Yoder, 2012), which entail a change in the traditional practice of patient-doctor relationships. The implementation of such practices, however, needs to overcome structural barriers related to this medical rationality and its evidence regime. The rationale of evidence-based medicine (EBM) is that clinical practice guidelines should only include diagnosis and treatment options whose effectiveness is scientifically proven, whereby the scientific evidence is supposed to be developed through the gold-standard of a meta-analysis of randomised clinical

trials (Broerse & Grin, 2017). While appropriate for linear causal questions and short-term effects, these methods have limitations for complex service interventions with non-linear mechanisms, context dependence and agency (Barlow, 2016; Greenhalgh et al., 2022). Broadening these evidence standards to integrate multiple traditions is essential when evaluating reconfigurations of service models, roles, workflows and technologies.

Embedded agency and institutional inertia

A peculiarity of the healthcare system is that change is usually initiated by actors from the system, while in other sectors innovative developments are often initiated by newcomers. This can be exemplified by the literature on the role of hospitals as a hub for research, innovation, and service change, as well as on the individual doctors as innovators, especially for medical devices (Barlow, 2016; Djellal & Gallouj, 2005; Saidi et al., 2020; Salge, 2012; Thune & Mina, 2016). The specific role of system actors as change agents may be the result of the fact that conventional medical rationality is so highly institutionalised in the healthcare system. While this has been the cornerstone to ensure effective and safe care, it also led to a situation where the system is rather closed (Broerse & Grin, 2017). According to Grin (2020), embedded actors have advantages in terms of access to resources, competence, and opportunities to influence perceptions of other actors and, thus, actively create cracks within a system. At the same time, embedded actors need to be able to create and maintain a protective space where diverging solutions can be developed. To create radically new approaches they need to be reflexive and strive for deep change by not only addressing the problems but also the underlying practices, structures, and systems that reproduce them (Grin, 2020; Schuitmaker-Warnaar et al., 2021).

To sum up, the challenges the healthcare systems are facing are a combination of internal and external factors. Demographic change, the rise in NCDs, old-age dependency, and expensive medical technology are meeting a system that is carried by an aging healthcare workforce and whose complexity results in ample inertia to change. Change initiatives like reforms, often did not achieve the envisioned cost-reduction but led to a depletion of the systems through underinvestment (Azzopardi-Muscat, 2020; Broerse & Grin, 2017; Kluge et al., 2023). Thus, the healthcare systems are facing wicked challenges, characterised

by their contestation, complexity, and uncertainty (Wanzenböck et al., 2020). To address these challenges, innovation is seen as one possible way to renew current practices.

1.3. Innovation and the transformation of service innovation

Generally speaking, innovation is understood as new or improved products, processes, services, and marketing approaches that differ significantly from previous ones (OECD, 2018), and has traditionally been framed as critical for technological change, creating or maintaining competitive advantages, and thus economic development (Schot & Steinmueller, 2018). Subsequently, traditional innovation studies aimed at explaining how innovations emerge and diffuse across contexts (Rogers, 1962). Early conceptualisations, such as linear models (Bush, 1945), framed innovation as a sequential process beginning with scientific research and culminating in market application. These models have been complemented by more complex approaches, focusing on the system interactions, network, and evolutionary theories (Dosi, 1982; Freeman & Soete, 1997; Kline & Rosenberg, 1986; Lundvall, 1992; Nelson & Winter, 1985) that foreground interdependencies, feedback mechanisms, and contextual dynamics. This systemic understanding of innovation (Edquist, 1997; Hekkert et al., 2007; Nelson, 1993), has recently been amended by a transformative perspective challenging this economic, firm-centred and technology-oriented tradition in innovation studies and policy (Diercks et al., 2019; Haddad et al., 2022; Schot & Steinmueller, 2018).

Central for understanding healthcare innovation is the distinction between invention, understood as the generation of novel ideas or methods, and innovation, defined as their practical implementation, thereby separating novelty from application, which was already introduced by Josef Schumpeter. The implementation aspect of innovation indicates the usage of novel concepts and normally, it is assumed that the market distinguishes invention from innovation through the diffusion of successful approaches (Rogers, 1962). However, implementation in public sector services like healthcare is more complex than a pure market selection (Greenhalgh et al., 2004; May, 2013a) and required an alignment between innovation and implementation context (Coelho Rodrigues et al., 2024; Moullin et al., 2019).

Given its nature as a service, another characteristic of healthcare innovations needs to be acknowledged as diverging from most mainstream innovation literature. Service innovation research faces challenges rooted in a service's intangibility, heterogeneity, inseparability of production and consumption, and perishability (Lovelock, 1983). Generally, services are understood as the application of competences, namely knowledge and skills, for the benefit of the service user, typically realised through technologically mediated processes that co-produce value through interactive engagement between provider and user (Vargo & Lusch, 2006). Following Gallouj and Weinstein (1997), the competences of both the provider and user as well as the material artefacts their draw upon during the interactional co-production of the service shapes the service characteristics.

Subsequently, the healthcare innovation discourse deviates from those in other sectors, as evident in the underuse of the innovation systems concept with notable exceptions (e.g., Consoli & Mina, 2009; Larisch et al., 2016; Marjanovic et al., 2020) and transformative change (Broerse & Grin, 2017). Thus, while the functions of science and technology systems contributing to pharmaceutical or medical device inventions are well understood (Barlow, 2016; Consoli & Mina, 2009), there is a relative scarcity of solution-focused literature on the role of innovating for healthcare service improvement that considers the systems-level (Greenhalgh et al., 2018; Marjanovic et al., 2020). Thus, the implementation side of innovation does pose a problem from a theoretical perspective as well as from a practical perspective, leading to a situation where only one in seven of evidence-based interventions is ever implemented - after an average of 17 years (Zullig et al., 2024). This challenge has been explained by tensions and conflicts between contradictory elements, working cultures, and convictions and the organisational and regulatory context (Haring et al., 2022) or, generally, by misalignments between innovations and their implementation context (Coelho Rodrigues et al., 2024).

Healthcare innovation can generally be described as novel approaches to unmet public health needs that create new ways of thinking and working. These changes aim to add value in the form of improved efficiency, effectiveness, quality, sustainability, safety and/or affordability and are implemented in the context of preventive, promotive, curative and rehabilitative and/or assistive care services. Healthcare innovation is characterised

by an overreliance on supply-driven innovation processes that historically arose from the biomedical paradigm and a linear innovation-diffusion understanding. The supply-driven character can be described as follows: Pharmaceutical and medical device companies develop new products, often in cooperation with publicly funded research organisation. These products are admitted to the market by governmental agencies and integrated into treatments according to reimbursement schemes of (public) insurances. Finally, these treatments are incorporated into care protocols and selected by healthcare professionals. In this process, patients are downstream and treated primarily as recipients of healthcare with very limited input to upstream decisions (Barlow, 2016; Broerse & Grin, 2017; Greenhalgh et al., 2018). The supply-side, as innovation policymakers, entrepreneurs, investors, as the demand-side as health policymakers, regulators, health technology assessment, purchasers, operate under different and often conflicting logics and ascribe different values to solutions (Greenhalgh et al., 2018).

Further, the implementation of novel concepts into healthcare services, depends on the agency of interdependent actors, highly organised, institutionally sanctioned, and systematically regulated changes in the structure and delivery of services (Barlow, 2016; Greenhalgh et al., 2018; May, 2013a; Shaw et al., 2017). Especially the implementation on non-pharmaceutical innovations organisational implications on healthcare services are challenging as they require a new routinisation of the work of healthcare professionals and patients (May, 2013a; Robert et al., 2010). Subsequently, implementation is highly dependent on the interactions between the innovation, local actors, and the wider context (Barlow, 2016; Nilsen & Bernhardsson, 2019). This results in a situation where there is not a single adoption decision, but adoption and generalisation unfold over time. In this process, the linkages and compatibility between organisational aspects and system-level aspects of an innovation are important (Moullin et al., 2019) and are further adjusted locally during adoption processes for a better contextual alignment (Barlow, 2016; Coelho Rodrigues et al., 2024). In this sense, healthcare innovations are developed in complex adaptive systems with multiple interacting sub-systems (Greenhalgh et al., 2018) that are full of misalignments, too complex to be comprehensively understood by participating actors, and subsequently waste resources by inventing novel solutions that lack implementation into service delivery.

Addressing this issue, implementation science, as "*the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services*" (Eccles & Mittman, 2006, S. 1), has been gaining traction over the last two decades. While most implementation studies either follow process models or determinant frameworks (Robert et al., 2010), implementation science also developed theories which include organisational readiness (Weiner, 2009), implementation climate (Klein & Sorra, 1996), or normalisation process theory (May & Finch, 2009). The deterministic approaches rooted in organisational studies typically study the impact of organisational variables, such as size, on the rate of adoption of technological innovations. While process studies determine whether and how technological innovations are adopted and assimilated into routine healthcare practice and are concerned with specific innovations, the different actors involved at various points in time, and the particular organisational context in which decisions are made (Robert et al., 2010).

One of the central approaches to studying these processes is the normalisation process theory as developed by May and Finch (2009), focusing on the way innovations are routinised into the work of healthcare professionals. The approach focuses on four dimensions: the interactional workability as the micro-level of the encounter between healthcare professionals and patients; the relational integration, focusing on changes in the relations around the clinical encounter (e.g., trust); the skill set workability that describes the fit with the formal and informal division of labour in a care setting; as well as the contextual integration that relates to organisational fit and change. Another central tool to understand and evaluate the complexities involved in implementing healthcare technologies, is the NASSS (Non-adoption, Abandonment, Scale-up, Spread, and Sustainability) framework developed by Greenhalgh and colleagues (2017). The framework comprises seven dimensions, which include the specifics of the condition or illness being addressed, the technology itself, the value proposition it offers, the adopter system involving staff and patients, the healthcare organisations implementing the technology, the wider institutional and societal context, and the interactions that evolve over time. Further, they elaborate that each dimension can pose challenges that can

range from straightforward issues, complicated if they involve multiple interacting components, to complex when unpredictable dynamics hinder mainstream adoption.

Generally, implementation studies and the service innovation literature both underscore the centrality of professional and patient competencies for implementing and sustaining healthcare innovations (May & Finch, 2009; Moullin et al., 2019; Windrum & García-Goñi, 2008). Central for implementation is a relational integration of novel approaches into service delivery systems, which depends on factors such as organisational readiness (Greenhalgh et al., 2017; May & Finch, 2009), and needs to overcome various tensions (Haring et al., 2022), conflicting values (Greenhalgh et al., 2018), and systemic misalignments (Coelho Rodrigues et al., 2024). Despite the importance of the implementation context and the agential characteristics, the demand-side is normally underused in healthcare innovation processes. In the context of NCDs, a reinforced focus on the demand through engagement of patients and patient organisations as "experts of experience" (Rabeharisoa & Callon, 2004) could help overcoming implementation barriers. By making healthcare professionals and patients credible participants in the knowledge construction (Boon et al., 2011; Epstein, 1995; Rabeharisoa et al., 2014), they contribute to the governance of emerging practices (Boon et al., 2011) and challenge the dominating supply-driven character of healthcare systems.

1.4. Research problem and objective

Modern healthcare systems face intertwined demographic, epidemiological, and fiscal pressures but structural inertia impede service transformation (Barlow, 2016; Broerse & Grin, 2017; Green & Lynch, 2022; Hughes et al., 2020). Innovation increasingly is seen as an instrument to improve healthcare services, yet healthcare systems struggle to generalise successful interventions within and across organisations (Greenhalgh et al., 2018; Haring et al., 2022; Lehoux et al., 2017; Zullig et al., 2024). The more complex the intervention, the higher the barriers for embedding and spreading (Greenhalgh et al., 2017). Subsequently, healthcare service innovations that break with established routines are a significant research problem, facing the following barriers:

- Wicked problems in complex adaptive systems: Ageing, NCDs, workforce and fiscal dynamics combine in ways that defy linear, uniform solutions. At the same

time the sector lacks capacities for orchestration of context-sensitive experimentation, learning, and generalisation (Broerse & Grin, 2017; Schuitmaker-Warnaar et al., 2021; Wanzenböck et al., 2020).

- Fragmentation and compartmentalisation: Highly specialised subsystems impede continuity of care and are ill-suited for chronic, complex conditions. Bridging initiatives often add complexity without resolving misalignments between organisational functions and population needs (Hughes et al., 2020; Lynch et al., 2022; Tzannis, 2013).
- Embedded agency and institutional renewal: System actors are pivotal for innovation yet constrained by entrenched rules and meanings. Transformative change requires reflexive reassessment of institutional logics, alongside protective spaces where alternatives can be developed and tested (Broerse & Grin, 2017; Grin, 2020; Schuitmaker-Warnaar et al., 2021).
- Inefficient supply-driven innovation models: Biomedically anchored, linear invention–diffusion models marginalise healthcare professional and patient agency, underestimate organisational issues and yield low implementation rates (Barlow, 2016; Broerse & Grin, 2017; Greenhalgh et al., 2022; Parsons, 1975).
- Underdeveloped generalisation frameworks: Dominant models focus on adoption of specific innovations but do not capture the dynamically evolving couplings between emergent practices and organisational and institutional structures that enable change in service configurations (Coelho Rodrigues et al., 2024; Nilsen & Bernhardsson, 2019; Pfadenhauer et al., 2015).

Considering these barriers and the pressure to adjust operations for NCD care, there is a need for better understanding the dynamics between service innovation and the transformation of the provisioning structures that afford it. This transformative change calls for a system innovation perspective that goes beyond isolated product or process changes (Broerse & Grin, 2017; Bugge et al., 2018; Grin, 2020), and instead generates new practices through the reconfiguration of actors, organisational and institutional structures. This stance moves beyond most innovation frameworks in healthcare (Eccles & Mittman, 2006; May & Finch, 2009; Windrum & García-Goñi, 2008) and aligns with transformative innovation policy and socio-technical transitions literatures (Geels, 2024;

Haddad et al., 2022; Köhler et al., 2019; Schot & Steinmueller, 2018). These streams, however, typically focus on system-level change and less on the micro-level of service practices.

The thesis therefore aims to develop and test a framework that connects micro-level changes in "*the things people do*" during healthcare service provision with a system-level perspective on transformative change situated within organisational and institutional affordances. To realise this objective, the thesis: first, re-theorises healthcare service innovation as a reconfiguration of actor, practice, and structure relations; second, explain how new services emerge and are implemented; third, clarify how implementation of novel approaches transforms existing services; fourth, inform healthcare and innovation policy on supporting transformative change in healthcare service provision.

2. Theoretical background

To address the research problem outlined in previous chapter, this thesis mobilises three theoretical lenses: social practice theories, institutional theory, and socio-technical theory. This chapter reviews these theories for the and introduces, their genealogy, their core concepts and mechanisms, as well as their application and critique. Each theory is discussed in a dedicated section that first introduces the theory's main elements, its conceptualisation of social change, and critically discusses its applicability in regards to the research problem.

2.1. Social Practice Theory

2.1.1. Main elements of social practice theory

Practice theory is a socio-cultural theory that is concerned with the relationship between the individual and society, thus, the question of how social order comes about and what the nature of social is (Reckwitz, 2002). It strives to overcome the dichotomy that structuralist theories, which assume existing social structures largely determine the actions of individuals, and individualist approaches that emphasise the agency of self-contained individual and reduce society to the sum of individuals and their actions (Røpke, 2009). In contrast, practice theory puts the focus neither on individuals nor the external factors and context conditions but on "*social practices ordered across space and time*" (Giddens 1984, p. 2). Thus, it assumes that actors and social structures are dialectically shaped at the level of a social practice (Schatzki, 2002; Shove et al., 2012; Watson, 2012). In such an understanding, individuals, in their role as practitioners, participate in practices which (re-)produce social structures, which in turn shape the context in which these practices are implemented.

Generally, theories of practice did not create one single theory but a plurality of similar approaches. Dating back only to the 1980s, SPT are still a relatively new theoretical stream in social science. Building on the seminal work of Bourdieu (1977) and Giddens (1984), they shifted the focus from structure and agency to the things people do in a habitualised manner. A second generation of SPT arose around the work of Knorr-Cetina, Schatzki and von Savigny (2001), who created a philosophical ontology of practices. The

third generation of SPTs developed analytical frameworks applicable for empirical studies, proponents of this are Reckwitz (2002), Røpke (2009), and Shove and colleagues (2012). Currently one can observe that insights from SPT have been further developed in several research fields incl., education, geography, history, art, sociology and political science, to organisational studies (Svennevik, 2022). While significant differences in ontologies prevails, according to Schatzki (2017), all accounts of these theoretical approaches share four tenets: First, practices are enacted by multiple people and in this sense are inherently social. Second, important social phenomena must be understood as dimensions of, constellations of, or rooted in practices. Third, practices and the actions that compose them rest on something that "*cannot be put into words*" and has been given names such as habitus, practical consciousness, practical understanding, know-how, or skill. Fourth, practice theories develop with the ideas of Heidegger and Wittgenstein in the background.

Following this theoretical understanding, practices are the *site of the social* (Schatzki, 2002), distinguishing practice theories from other social theories (Reckwitz, 2002). In this sense, practice theory puts the emphasis of social analysis on the things people do and say in a very basic way – they cook, eat, sleep, take care of their children, shop, play football, and work (Røpke, 2009). Schatzki describes these social activities as practices, which are distinct from the materialities, and defined as an "*open spatial-temporal array of doings and sayings that is governed by a largely normative array of understandings, rules, teleologies, and emotions.*" (2019, p. 35). These sets of organised doings and sayings (Schatzki, 2002), are brought together with materiality in practice-arrangement bundles, which mesh in contingently and differentially evolving configurations of organised activities and material arrangements. In this understanding, material arrangements are the sum of connected material entities, comprised by humans, artefacts, organisms, and phenomena of nature. Schatzki (2019), similar to Bourdieu's (1977) field terminology, describes the entirety of practices and material arrangements as a practice plenum and single social and material phenomena as slices of this plenum. As such practice theory builds on a flat ontology (Schatzki, 2002) and every human phenomenon exists as a part of practice (Shove et al., 2012)

In this understanding, any practice is comprised by multiple interrelated and interdependent activities and material arrangements, that need to be intelligible to participants within a specific situational or spatio-temporal context (Feldman & Orlikowski, 2011) and regularly performed and recognised by multiple individuals. As they draw on and are guided by teleoaffective structures, encompassed by both teleologies as the ends or goals as well as the affectivities as the emotions or moods, practices are collectively meaningful.

While Schatzki treats practices as purely social phenomena, he also acknowledges that practices are bundled with material arrangements to the point that "*bundles, not practices, are the central unit of conceptuality in the analysis of social life*" (2019, p. 44). This entanglement is the reason other conceptualisations of practice like in Reckwitz (2002) or Shove and colleagues (2012) build materials into practices. Generally, the relationship between practices and materiality following Schatzki is complex as practices use, set up, give meaning to, and are directed toward and inseparable from arrangements and their components, whereas arrangements and their components induce, prefigure, channel, and are essential to practices. Thus, practices both produce and consume materiality (Røpke, 2009; Svennevik, 2022).

In their seminal book, Shove, Pantzar and Watson (2012), took an "*elemental*" approach to de-centre the human actor and shift the focus on the elements of which practices are made of, suggesting that people are usefully understood as the carriers and integrator of practice. They build on Reckwitz's definition of practice as "*forms of bodily activities, forms of mental activities, "things" and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge*" (2002, p. 249), and operationalise practices as the interdependent relations between the three elements of materials, competences, and meanings. In this simplified framework, materials include objects, infrastructures, tools, hardware, and even the body itself. Competences encompass various forms of understanding and practical knowledge, including practical consciousness, cultivated skills, and shared understandings of appropriate performance. Meaning combines mental activities, emotions, and motivational knowledge, representing the social and symbolic significance of participation in a practice. Shove et al. (2012) argue that practices emerge, persist, shift, and disappear as links between

these defining elements are made, sustained, or broken. Thus, practices bring these elements together through their performance. In this conceptualisation, through shifting the focus from practitioners, the things practitioners *actually do* or how they interact lost prominence.

This conceptualisation of the relationship between the social and material generally puts the relations and links between practice elements, practices and wider constellations into focus. While Schatzki (2019) distinguishes between bundles as links between activities of individuals and material components they draw upon, he also describes wider constellations which are simply more complex bundles of practices and arrangements. Thus, the number of practices and arrangements that are linked in a bundle or constellation can range from few (e.g., working at the office) to many (e.g., an economic system) and describe social phenomena of varying complexity. This relationship links the single practice or bundle to social structures and concepts like organisational fields or economic paths (DiMaggio & Powell, 1983; Smets et al., 2017). Bundles form constellations through five fundamental types of relations: shared or orchestrated teleologies, emotions, rules, and understandings; intentional relations between participants; chains of action that link sequences of practices; material connections such as infrastructures and shared objects; and prefiguration, where one bundle influences the potential course of another (Schatzki, 2019). These relational dynamics allow practices to interweave and shape one another, enabling the circulation of beliefs, emotions, and material entities across social contexts. This circulation not only connects bundles but also contributes to their transformation by altering how actors engage with them, thus influencing which bundles are sustained, modified, or replaced over time.

2.1.2. Social change and dynamics in practice theory

As established in the previous section, the things people do and the societal organisation of these doings occurs in practices and, thus, change in practice is an account of social change that alters the practice, the involved practice-arrangement bundles, or their constellations. In this context, change is the succession of at least two different states of the world. Schatzki (2019) describes social change as the existence of significant differences in social life and social phenomena. These alterations arise from events and

processes that befall the practices, arrangements, and bundles in which such phenomena persist. He understands an event as a basic "*happening or coming to be of something*" (2019, p. 14) that marks a difference with the prior state of the world, whereby the central kind of event bound up with social change is human activity. These events and their reactions can form chains of activity that occur when people react to e.g., actions of others, to changes in social affairs, to new opportunities, and to natural events. These processes, whether they embrace multiple events or exhibit an unfolding quality, generate even more differences and transpire within and across practices. Thus, following Schatzki the main source of social changes emerges from the events and continuous unfolding processes of these occurrences that befall bundles and their components. These changes can affect the organisation of a practice, which includes its normative array of understandings, rules, teleologies, and emotions or directly alter material arrangements and indirectly influencing practices. However, not all differences constitute change and events, processes, and their nexuses are not just responsible for changes but also for the persistence and stability of social affairs. Schatzki, thus, emphasises that understanding change requires examining the nexuses of these activities and materialities that bring about differences in the practice plenum.

For analysing practice change, the elemental approach of Shove and colleagues (2012) is most commonly used (Svennevik, 2022). They conceptualise change in practice as the dynamic interplay between the constituent elements of a practice, namely materials, competences, and meanings. Their perspective posits that practices emerge, persist, transform, and disappear through the making and breaking of linkages between these elements. It is similar to Schatzki as it builds on the assumption that social change is a result of the evolution of practices as discernible entities shaped by the integration and disintegration of their core components. Figure 1 illustrates the establishment of links between the practice elements as developed by Shove et al. (2012):

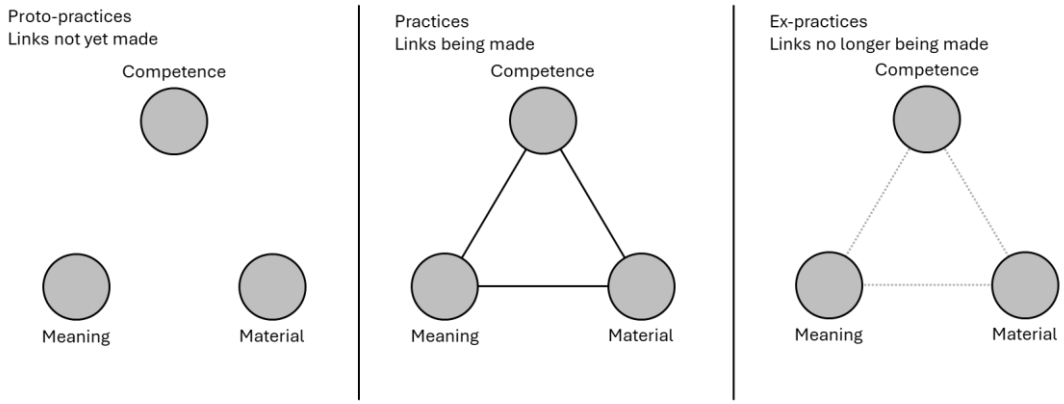


Figure 1: Proto-practices, practices, and ex-practices (Shove et al., 2012)

Change within this framework arises through the establishment of new connections between existing or emergent materials, competences, and meanings, forming what can be considered proto-practices. A practice is maintained through the continuous linking between these elements while its cessation occurs when the linkages between its essential elements are no longer reproduced or sustained. This may involve the obsolescence of technologies, the decline of necessary skills, or the transformation of associated symbolic significances. Analogous to Schatzki's conceptualisation, Shove et al. (2012) suggest that stability and routinisation are not end points of a linear process of normalisation. Rather, they should be understood as ongoing accomplishments of being engaged in practice that requires reoccurring investments and efforts of repeatedly linking elements together.

A central aspect of this conceptualisation is that elements are not necessarily confined to single practices. Thus, change arising in one practice can easily circulate between practices across various domains of social life, influencing the trajectory of multiple practices simultaneously. This interconnectedness implies that changes in one practice can have cascading effects on others, leading to broader social change. For example, the development and diffusion of new technologies (materials) can necessitate the acquisition of new skills (competences) and alter the social significance (meaning) of related activities. However, change is emergent and path-dependent with the historical context and the existing landscape of interconnected practices significantly shaping the potential for and direction of change.

Two main pathways for the spread of practice change can attributed to the practitioners and the circulation of elements. First, the ways in which individuals are recruited into

practices, the development of their expertise, and their eventual defection from practices contribute to the overall reproduction and transformation of these entities over time (Zucker & Schilke, 2019). Second, while practices are always in the process of formation, re-formation and de-formation, their elements remain comparatively stable and are, as such, capable of circulating between places and enduring over time. We are consequently surrounded by things that have outlived the practices of which they were once a vital part (Shove & Pantzar, 2005) and include old elements in novel practice constellations, thus regenerating them (Laakso et al., 2021).

2.1.3. Critical reflections on the use of practice theory

While SPT has gained considerable traction in contemporary social sciences, particularly in areas concerned with sustainability, consumption, and transition studies (Røpke, 2009; Sovacool & Hess, 2017a), the deployed theoretical and methodological concepts have not escaped critique. Two recurrent criticisms pertain to its apparent difficulty in accounting for systemic change and its limited capacity to transcend a micro-level focus on the doing of practices (Watson, 2012). These shortcomings restrict the applicability of SPT in contexts where understanding changes in societal systems is the focus. Thus, criticisms and limitations have been voiced by the sustainability transition literature, aiming to forge cross-over frameworks between SPT and the multi-level perspective or transition management (Svennevik, 2022; van Uden et al., 2024).

While practice change has been a core theme in the SPT literature (Schatzki, 2019; Shove et al., 2012), studies have a tendency to emphasise stability and reproduction over change and struggle to address large-scale phenomena. Generally, Schatzki (2019) argues that these large phenomena are depending on chains of activity affecting the nature of practice-material arrangements within larger constellations, however, there are methodological limitations in capturing these larger-scale interconnections, which constrain SPT's contribution to analysing dynamic system-level transformations (Klitkou et al., 2022). Thus, SPT is criticised for being overly descriptive, with limited normative or explanatory capacity. Geels (2011) contends that the framework lacks the strategic orientation necessary to guide interventions, while Laakso et al. (2021) argue that it offers insufficient explanatory concepts to account for structural transformation. From a systems perspective, this is a significant limitation, as the interconnectedness of

practices is critical for understanding how institutional, technological, and behavioural aspects co-evolve over time.

The most common framework for analysing change is the elemental model proposed by Shove and colleagues (2012), framing practices as the linked combination of materials, meanings, and competences. This formulation, although influential, does not adequately capture actions, interactions as well as the spatial and temporal dimensions inherent in many practices. To remedy this, Kokko and Fischer (2021) proposed the addition of "activity" as a fourth element, providing a means to account for the dynamic contexts in which practices are situated. While Schulz et al. (2019), building on Schatzki, describe a practice as a configuration of doings, sayings, and materiality to capture the functional, discursive, and physical articulation of each practice. This adjustment becomes especially pertinent in sectors such as service industries, where the interaction between provider and user critically shapes the nature and quality of service provision (Gallouj & Weinstein, 1997; Windrum & García-Goñi, 2008). Building on these concerns, van Welie et al. (2018) argue for an expanded view of practices within what they call a service regime. Here, practices are decomposed into five key dimensions: infrastructure and artefacts, organisational mode, time and space, rationale/meaning, and social interaction. This model facilitates a more granular analysis of how technologies, organisational practices, and user behaviours are imbricated within certain systems. Such perspectives are essential for identifying mechanisms of change and reproduction going beyond a focus on practice-materiality bundles.

Despite these promising extensions, some scholars question the effects of these approaches on the theoretical consistency and coherence of SPT. For example, Schulz et al. (2019) also raises concerns regarding conceptual integrity, pointing to the risk of these diverse interpretations and implementations of practice theory diluting its theoretical core. Stating that this " *the diversity in the 'practice' of using practice theory might undermine the concept's core assumptions and loosen its conceptual rigour*" (2019, p. 3). At the same time, they acknowledge the methodological demands as advocated in SPT can become burdensome, often exceeding the temporal and financial constraints of empirical projects. The resulting need for pragmatic compromises in research design further limits the theory's practical applicability.

2.2. Institutional Theory

2.2.1. Main elements of institutional theory

New institutional theory or neo-institutionalism is a theoretical framework that seeks to explain how institutions, which are described as the informal constraints, sanctions, taboos, customs, traditions, and codes of conducts and the formal rules, constitutions, laws, property rights (North, 1990), influence the behaviour of individuals and organisations. Since its emergence in the 1970s and 1980s it has been used in fields like sociology, political science, organisational studies, and economics, as a response to earlier behaviouralist and rational choice approaches, emphasising that institutions are not merely constraints on behaviour but are themselves socially constructed and deeply embedded in culture and history. This relativisation of the neo-classical rational actor model shifted the focus on the importance of the impact that institutional environments have on the cognition and behaviour of actors and thus on the diffusion of practices.

Meyer and Rowan (1977) and DiMaggio and Powell (1983) first describe how this social embeddedness of organisations leads to similarity in structure and behaviour due to actors' pursuit of legitimacy. The resulting organisational isomorphism is a process during which organisations incorporate societally legitimated elements into their formal structures to maximise their legitimacy and increase their resources and survival capabilities (Meyer & Rowan, 1977). DiMaggio and Powell (1983) introduced the concept of an organisational field, to describe the sum of all organisations that are exposed to the same institutional environment and thus experience the same legitimacy pressures. They show that within a field, actors become similar not by the quest for efficiency but by the pursuit of legitimacy in response to external pressures. They distinguish between three types of isomorphic pressures: *coercive*, stemming from legal and regulatory demands; *mimetic*, arising under conditions of uncertainty where organisations imitate more successful or legitimate peers; and *normative*, rooted in professional norms and shared standards. Through these mechanisms, organisations adopt similar structures and practices, often irrespective of their direct technical utility. These insights have since then been further developed, with scholars being interested in questions of interests, power and agency for shaping the institutional setting and affecting institutional change. To understand these processes, fields must be seen, not as containers for the community of

organisations, but instead as relational spaces that provide an organisation with the opportunity to involve itself with other actors (Wooten & Hoffman, 2017). Thus, fields are contextualised spaces where disparate organisations involve themselves with one another to develop collective understandings. In this context, two concepts are central - institutional logics and degrees of institutionalisation.

Following Zucker (1977), the degree of institutionalisation is a variable that shows different degrees, thus, not all practices are equally institutionalised. Institutions that are young or contested are more vulnerable to challenge and less apt to influence action. Based on the integration of institutionalisation and structuration theory (Giddens, 1984; Tolbert & Zucker, 1999), one can argue that institutionalisation reflects an increasing degree of structuration, such that highly institutionalised structures, characterised by longevity, scale, and legitimacy, can be regarded as institutions (Fünfschilling, 2014).

Tolbert and Zucker (1999) conceptualise institutionalisation as a dynamic, multi-stage process comprising habitualisation, objectification, and sedimentation, each representing an increasing degree of exteriority and perceived objectivity. *Habitualisation* involves the informal and often unstable emergence of practices by a few actors in response to recurring problems. In the *objectification* stage, broader social consensus forms, and institutional work helps stabilise and diffuse the practice. *Sedimentation* marks the widespread, enduring adoption of a structure, which becomes taken for granted, highly stable, and resistant to change. In contrast, de-institutionalisation is understood as the reversal of this process. The degree of institutionalisation affects a structure's durability, diffusion, resistance to change, and embeddedness in broader institutional logics. Organisational fields (DiMaggio & Powell, 1983; Wooten, 2015) vary in their level of structuration. Some are dominated by sedimented structures, while other consist of more fluid, evolving, and often conflicting elements. Coherence within a field thus depends not only on the degree but also the content compatibility of institutional structures, which can be analysed through the institutional logics perspective.

The institutional logics (Friedland & Alford, 1991; Thornton et al., 2012; Thornton & Ocasio, 1999) approach is used to highlight how actors are influenced by their institutional context by focusing on the content and meaning of institutions. Logics suggest that society consists of various institutional orders that entail different

rationalities, building on different beliefs, norms, values and practices that shape actors' cognition and behaviour. These are defined as *"the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality"* (Thornton & Ocasio, 1999, p. 804). Thus, they shape what is considered legitimate, appropriate, and possible in each context by providing a macro-level belief system that guides and constrains individual and organisational behaviour by offering templates for action and interpretation. Generally, seven ideal types of distinct organising principles are found across major institutional orders in Western societies, each offering a different source of legitimacy, authority, identity, and rationale for action: the family, the community, the religion, the professions, the state, the corporation, and the market (Thornton et al., 2012). For example, the market logic builds on the principle of competition, gains legitimacy through consumer choices, is organised through the means of market transaction, and has the end of making a profit. In contrast the state logics rests on regulation and bureaucratic control, gains legitimacy through democratic processes, provides order through policies and regulations, and follows the end to establish public welfare and social order. While these logics are ideal types, they can provide analytical constructs to identify dominant belief systems, providing a collective rationality (Scott, 2001) to actors within an organisational fields. However, neither actors, organisations nor fields are homogeneous and often experience institutional complexity, where multiple logics coexist, conflict, or hybridise. The institutional logics perspective provides a framework to analyse how actors navigate, negotiate, and reshape this plurality of logics in practice.

Following Fünfschilling's approach (2014), the intersection of institutionalisation with the institutional logics perspective can be mobilised to analyse processes of structuration within organisational fields. Field logics can themselves progress through varying degrees of institutionalisation and travel from loosely structured, habitualised elements, through phases of objectification marked by growing consensus and diffusion, toward sedimentation, where practices, norms, and actor roles become deeply embedded, widely adopted, and taken for granted. In this mature stage, institutional elements may align into a very coherent field logic, which then exerts a high degree of structuration.

2.2.2. Social change and dynamics in institutional theory

In neo-institutional theory, social change is the result of changes in the institutions that shape the behaviour of actors, organisations, and the field as such. Subsequently, social change rests on institutional change, which refers to the processes through which the structures, norms, rules, and logics are altered, replaced, or reinterpreted. Research on institutional change has developed along three principal lines, each emphasising differences in the origins, mechanisms, and unfolding of change (Smets et al., 2012).

The first and earliest perspective conceptualises change as a consequence of exogenous shocks that disrupt otherwise stable institutional arrangements. Such shocks arising from shifts in societal values, regulatory regimes, or technology, create opportunities for actors to reflect on the institutional logics that structure their environment and to envisage previously inconceivable alternatives. Studies in this tradition often am to understand under which circumstances, institutional entrepreneurs (Battilana et al., 2009; Leca & Naccache, 2016) are able to introduce novel logics and organisational forms into established fields. Institutional entrepreneurs are frequently conceptualised as being at the periphery of a field where they are less constrained by prevailing arrangements (Smets et al., 2012).

A second stream puts the attention on the endogenous field-level contradictions as a source of change. Seo and Creed (2002) building on the institutional logics approach (Friedland & Alford, 1991) argue that the potential for change is inherent to most fields because they fields typically embody multiple and sometimes conflicting logics. Actors at the intersection of these tensions can consider different responses these pressures and, thus, to initiate change. This stream focuses on rhetorical, discursive, and political work involved in mobilising alliances and orchestrating collective action (Smets et al., 2012).

The third perspective (Kellogg, 2009; Pache & Santos, 2010) locates the impetus for change within the dynamics of individual organisations. Building on Meyer and Rowan's (1977) idea of decoupling, the approach considers how organisational responses to institutional pressures are mediated by internal politics, interests, and values. In this stream, the gate-keep role of senior managers, sense-making, and relational spaces,

providing physical and political conditions for coordinating change, are central (Smets et al., 2012).

Closely linked to questions of institutional change, the literature on institutional work emphasises reflexive, capable actors and their actions in institutional dynamics, and seeks to capture the interplay between structure and agency (Lawrence et al., 2013). Institutional work, thus, describes the duality of the actor-structure relationship from the perspective of institutional change. It was coined by Lawrence and Suddaby (2006, p. 215) who defined institutional work as: "*the purposive action of individuals and organisations aimed at creating, maintaining and disrupting institutions"*. To this end, actors mobilise resources or aim at (de-)construction of rationales (Hardy & Maguire, 2017).

With its detailed analysis of forms and aims of institutional work (Lawrence & Suddaby, 2006), this stand of literature offered a corrective to overly simplistic portrayals that depict institutional entrepreneurship as largely detached from its context, or institutional reproduction as an entirely unreflective process. Research can be grouped into three broad questions: how institutional work occurs, who engages in it, and what constitutes it (Lawrence et al., 2013). The issue of how institutional work occurs has been examined in terms of the typology of creating, maintaining and disrupting institutions with a focus on institutional entrepreneurship and a recent "*practice-turn*" (Smets et al., 2017), exploring the creation of institutions from a work perspective. In this context, Zietsma and Lawrence (2010) highlight the importance of shared boundaries and practices, as entities by which individuals and groups struggle over and come to agree upon definitions of reality. In terms of who engages in institutional work, much attention has been paid to professionals and their role in reconfiguring institutions. Professionals play a central role in institutional work by leveraging their expertise, legitimacy, and social capital to challenge existing arrangements, introduce new actors and identities, and establish emerging rules and standards. They also manage the distribution and reproduction of social capital within a field, thereby reshaping its boundaries, hierarchy, and social order (Lawrence et al., 2013; Suddaby & Viale, 2011). Finally, the stream on *what* constitutes institutional work focus its relationship to agency, drawing on a relational, multi-dimensional understanding of agency that includes habit, imagination and practical

evaluation. This work is closely related to the paradox of embedded agency (Battilana et al., 2009; Seo & Creed, 2002) and intentions, which will vary depending on the dimension of agency that dominates the instances of institutional work one considers (Battilana & D'Aunno, 2009).

With locating the origin of change in work and everyday practice, institutional theorists have followed a practice-turn, which has characterised much of organisation theory in the last twenty years (Knorr-Cetina et al., 2001; Smets et al., 2017). This practice perspective stresses that neither dramatic events, technological disruption, nor 'heroic' entrepreneurship is the source of institutional change. Instead, it may be the mundane doing of everyday work in which practitioners develop the need as well as the destination of change (Bridwell-Mitchell, 2016; Smets et al., 2017). In such an understanding, the source of macro-social change is always endogenous, emergent and inherent to practice, during which people learn new ways of interpreting and experiencing the world (Orlikowski, 2002). Institutional change, thus, originates from practice and has the potential to move from practice to field (Smets et al., 2012), which is implicitly coordinated by communities of practice (Bridwell-Mitchell, 2016). One consequence from such a practice perspective is a shift in the directionality of change agency, as "*most people do not set out to affect the institutional arrangement that surround them, but to cope with the practical exigencies of the situation they find themselves in"* (Smets et al., 2017, p. 12).

2.2.3. Critical reflections on the use of institutional theory

The rapid expansion of institutional theory has made it increasingly fragmented and it has been criticised for being increasingly vague with unclear boundaries, leading to a situation where it "*seems to produce much more heat than light*" (Alvesson & Spicer, 2019, p. 8). Institutional theory has been applied as lens (Lawrence et al., 2013) as much as been treated as a real world phenomenon (Delbridge & Edwards, 2013). Alvesson and Spicer (2019) further criticise the use of tautologies, e.g., often resulting from unclear differences between institutions, institutional logics, or institutional orders, the pseudo-progress that institutional literature produces by studying phenomena that are well known in other streams, leading to a situation where institutionalists re-invent the wheel by identifying research gaps that are well studied in other disciplines. Generally, while the

classic institutional theory as developed by Meyer and Rowan (1977) and DiMaggio and Powell (1983) is powerful in explaining the tendency for organisations to become more similar to each other over time, more recent alternatives, such as institutional work and institutional logics perspectives, only offer catalogues of empirical observations and new labels of already known theoretical constructs (Aksom & Tymchenko, 2020). Thus, the focus of institutional research should be to show that organisational fields will return to isomorphic dynamics and move towards homogenisation no matter how much radical change occurred (Aksom & Tymchenko, 2020; Alvesson & Spicer, 2019).

Thus, there is a call to focus on the "*very roots of institutionalism – stasis and continuity – as influences upon organizations*" (Greenwood et al., 2017, p. 24) and the what institutional pressures look like and the forms they take. This is in line with calls for conceptualising organisational fields as relational spaces where interactions generate collective rationality, shape identities, influence intra-organisational processes, and mediate the translation of practices (Wooten & Hoffman, 2017). However, rather than focusing on sources of change, a focus could be on understanding the forces that re-establish the field after the implementation of a radical structural change (Reay & Hinings, 2005). In the context of this thesis, the practice-turn and changes and stability in practice relate to field-level processes within a mature organisation field is of interest and is in line with efforts to reconcile micro- and macro processes of change and stability in institutional theory (Smets et al., 2017; Zucker & Schilke, 2019). Thus, the question of how changes in the organisation of work relates to changes in field-level entities and the mechanisms that modulate organisational responses to isomorphic pressures, institutional demands and praxis (Pache & Santos, 2010; Smets et al., 2017).

2.3. Socio-technical system Theory

2.3.1. Main elements of socio-technical system theory

With its roots in the mid-20th century, socio-technical theory responded to the need to better understand the challenges of integrating technological inventions into the routines of industrial workers (Trist & Bamforth, 1951). It emphasises the interdependence of social and technical systems within organisations, countering to ideas of technological determinism. The concept became foundational for sustainability transition studies,

which describe socio-technical systems as complex configurations that integrate social and technical elements to fulfil societal functions like the provision of housing, mobility, food, or healthcare (Geels, 2024). These systems are characterised by the interplay between technologies, actors, institutions, and cultural elements. Through the emerging frame of transformative innovation, socio-technical thinking entered innovation theories and policy (Diercks et al., 2019; Haddad et al., 2022; Schot & Steinmueller, 2018). In transition studies (Fünfschilling & Truffer, 2014; Geels, 2004; Grin et al., 2010) and transformative innovation policy studies (Haddad et al., 2022; Schot & Steinmueller, 2018), transformative change refers to a profound shift within these socio-technical systems with the aim of addressing complex societal challenges.

These societal challenges, resulting from unsustainable consumption and production patterns in socio-technical systems, are core themes of sustainability transitions (Geels, 2024; Köhler et al., 2019). These problems are assumed to require radical shifts to new kinds of socio-technical systems rather than incremental improvements and technological fixes. As such, transition studies neither focus on macro-levels, e.g., changing the nature of capitalism, nor the micro-level of individual choices, attitudes and motivations, but rather on the meso-level of the socio-technical system that describes how certain societal functions are fulfilled (Köhler et al., 2019). Generally, transitions are understood as long-term, non-linear, and co-evolutionary processes that depend on multiple interlinked phenomena like technologies, markets, user practices, and institutions, that are shaped by complex actor networks with competing interests, strategies, and forms of agency. Subsequently, transitions are inherently uncertain, value-laden, and contested, and require the directionality and support of public policy to navigate entrenched resistance, align pathways, and steer change toward sustainability goals.

Following Markard and colleagues (2012), four main conceptual frameworks exists to study transitions: technological innovation systems, strategic niche management, transition management, and the Multi-Level Perspective (MLP). Arising from the innovation systems tradition, technological innovation systems provided a dynamic framework for analysing key functions such as knowledge development, legitimation, and market formation that together support the emergence of new technological systems

(Bergek et al., 2008; Hekkert et al., 2007). Strategic niche management, which arose on the intersection of sociology and evolutionary economics (Köhler et al., 2019), provides a framework to study how radical innovations emerge in protected spaces through iterative learning, network building, and the articulation of expectations, enabling the formation of alternative trajectories that may eventually challenge or transform dominant regimes (Schot & Geels, 2008). Transition management provides a governance-oriented approach that proposes strategic, tactical, operational, and reflexive activities to guide and accelerate long-term sustainability transitions through participatory, multi-level policymaking and experimentation (Loorbach, 2010; Rotmans et al., 2000).

However, the dominate theoretical framework to study on transformative change is the MLP, which was popularised by Frank Geels seminal works (2002, 2004) and provides framework for understanding how transitions and transformations occur within socio-technical systems (see Figure 2). It focuses on the interactions between three distinct levels: niches, regimes, and the broader socio-technical landscape. At the niche level, (radical) innovations emerge and are experimented with in protected spaces outside the mainstream. These innovations often challenge established norms and practices but require shielding from market pressures and societal expectations to develop and mature. The regime represents the dominant, stable configuration of a socio-technical system, including its institutions, technologies, policies, and social norms. Regimes are characterised by their stable alignments of their socio-technical elements and thus resist to change. The landscape is the broader macro-level environment that shapes the conditions under which regimes and niches operate. It consists of slower-moving external factors like cultural values, political contexts, economic trends, and environmental changes, such as climate change or resource scarcity (Geels, 2024).

2.3.2. Social change and dynamics in socio-technical transition theory

The general idea within transition studies is that (radical) innovations are developed within a niche and, when successful, transform the existing structuration of a socio-technical regime. Thus, transitions occur when niche innovations in technologies, business models, or social practices gain enough momentum and/or external pressures or shocks from the landscape, e.g., price shocks, global pandemics, or wars, create opportunities to challenge the stability of an existing regime. In this thinking, niches are

normally considered to be “protected spaces”, taking the form of e.g., R&D projects, subsidised experiments or demonstration projects, or local grass-rooted initiatives (Schot & Geels, 2008), while regimes form the “deep structure” that accounts for the stability of an existing socio-technical system (Geels, 2011). Niches are vital for articulating expectations or visions, building social networks, and for learning about technical design, market demand, user preferences, infrastructure requirements etc.

In this conceptualisation, radical niche innovations face uphill struggles against the existing socio-technical regimes, which are reproduced, maintained, incrementally improved, and regulated by incumbent actors such as firms, engineers, users, and policymakers (Geels, 2024). Change within regimes is mostly incremental as regimes guide search, innovation, and investment activities in a particular direction, resulting in stable configurations. Actors embedded within these systems are socialised into the regimes interests, perceptions, and rules and thus struggle to break with these institutions (Fünfschilling & Truffer, 2014; Zucker & Schilke, 2019). For implementation into socio-technical regimes, radical innovations need to overcome the systemic inertia that provide resistance and lock-ins of existing regimes. Geels (2024) summarises these lock-ins in four categories. Techno-economic aspects cover dimensions like sunk investments, low-cost and high-performance of existing technologies. Social and cognitive lock-ins are rooted in routines, shared mindsets, and capabilities that guide actors’ perceptions and actions in particular ways, social networks that interdepended economic relations, or lifestyles that are formed around certain technologies and infrastructures. Institutional and political lock-ins include situations where existing policies favour incumbent actors and create an uneven playing field, or the privileged access of incumbent actors to decision making that could block support of radically new approaches. Overcoming these lock-ins requires ongoing and persistent actions from actors at various levels and with different positions and roles within these system (Grillitsch & Sotarauta, 2020).

To overcome these barriers, the conceptualisation of social change in transitions depends on the on the interactions between niche and regime in the development and change the structure of socio-technical systems. The routes that novel approaches travel from the niche to a socio-technical regime have been labelled as pathways. Geels and

Schot (2007) summarised the various understandings and typologies under the following four processes. Technological substitution is the conventional transition pathway in which a radical innovation emerges in a niche and replaces an existing system. Landscape pressures may create a window of opportunity if the niche innovation is sufficiently developed. Transformation is a pathway, during which an existing system is gradually transformed through successive incremental innovations based on changes in in regime rules and institutions. It occurs under moderate landscape pressures at times when niche innovations are insufficiently developed. The de-alignment and re-alignment pathway is initiated by major landscape shocks, resulting in disruption, de-alignment, or collapse of an existing regime at a time when niche innovations are not or insufficiently developed. The subsequent search for new approaches results in the emergence of multiple niche innovations until the re-alignment of multiple elements leads to a new system. In the reconfiguration pathway, transitions happen because multiple niche innovations are incorporated into the existing system, triggering further changes that ultimately change the system's architecture. As most changes are slow and far from dramatic overturning of systems, scholars have realised that the transformation and reconfiguration pathways may better explain real-world developments in electricity, heat, mobility, agrifood, and industrial systems (Geels, 2024).

Due to the convergence of transition and innovation studies under the umbrella of transformative innovation policy, current understandings of innovation processes are being opened and reimagined. Especially, the nexus of transition pathways and diffusion theories of innovation studies are subject of reimagination, as they are of paramount importance in the transformation of socio-technical systems (Robinson et al., 2024). While transition studies most built on the pathways as introduced above (Geels, 2024), the dominate diffusion theory in innovation studies is based in Rogers' (1962) work. Generally, diffusion describes the processes through which an innovation spreads over time among the members of a social system. In Rogers' conceptualisation diffusion is focused on product innovation and their spread through markets and is comprised by five main elements: the innovation, adopters, communication channels, time, and the social system (Rogers, 2004). Both, transition pathways and diffusion theory, have been criticised and amended by context-specific studies (Sengers et al., 2021).

To bridge the gap between one-size-fits-all and contextualised studies on the spread of technologies, the concept of generalisation processes has been introduced into the debate recently (Robinson et al., 2024; Sengers et al., 2021; Weber et al., 2024). Generalisation, as depicted in Figure 2, is as an umbrella term capturing the routes and processes that shape, normalise, and embed the outcomes of innovation into socio-technical systems (Robinson et al., 2024). In contrast to diffusion, generalisation introduces a broader perspective, going beyond single products, processes or service, providing an architectural perspective on systemic innovation processes (Weber et al., 2024). Sengers et al. (2021) introduce four mechanisms for generalisation – i) adapting institutional frameworks, ii) replication adaptation, and proliferation, iii) expansion, scaling, and consolidation, as well as iv) circulation and anchoring of new knowledge, and stress that combination of all four mechanisms is often needed due to the inertia of and complex interdependencies within prevailing systems.

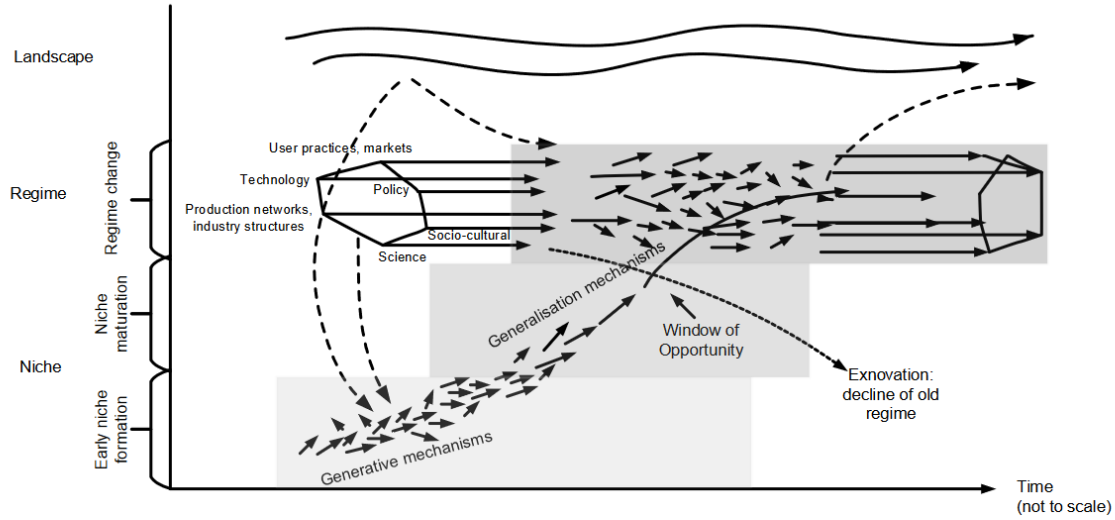


Figure 2: Multi-Level-Perspective for Social Innovations (Weber et al., 2024)

Robinson and colleagues (2024) introduced eight conceptual building blocks of generalisation for a new research agenda and for guiding innovation diffusion policy for transformative change. They stress that innovations are not confined to technologies but also encompass organisational, service-oriented, and conceptual forms, many of which may be non-commercial. They recognise that users are active participants in diffusions process and, due to their varying needs and practices, are co-creators and adaptors rather than passive recipients. Further, innovations themselves are not static but co-evolve as they spread and respond to feedback and changing contexts and they do that

with varying timeframes. Innovations can carry diverse institutional logics, e.g., they could build upon market-driven, community-led, or state-based logics, and subsequently introduce distinct goals and frameworks that shape generalisation. They point us towards the normative dimension of innovation and the dilemmas arising from fast spread of innovations with negative consequences. They, further, emphasises that diffusion also involves the discontinuation of older technologies or practices, which is an essential part of transformative change in any system. Finally, the diffusion of entire socio-technical systems, as bundles of innovations rather than isolated innovations, is essential for addressing complex challenges but requires integrated shifts across sectors and infrastructures.

2.3.3. Critical reflections on the use of socio-technical system theory

Sustainability transition research and the concept of the MLP as well as transformative innovation thinking are still young social theories, that are shaped by a growing community and an ambitious research agenda (Geels, 2019; Köhler et al., 2019). Despite this dynamical development, the theory and methodological approaches are not free of critique. Generally, the MLP provides a theory of change in socio-technical systems, drawing on Schumpeterian evolutionary economics to highlight radical innovation and creative destruction waves (Geels, 2019). With this level of abstraction, most criticisms argue that the frameworks on the MLP does not allow for analysing processes of change with the level of granularity needed to produce meaningful insights. While different aspects have been identified as areas that require further research (Köhler et al., 2019), or been discussed in responses to these criticisms (Geels, 2011, 2019), in the following the most critical issues in the context of this thesis are introduced.

A recurring critique concerns the underemphasis of agency. The conceptualisation of the MLP is regarded as too descriptive and structurally oriented, resulting in an underdeveloped account of the role that actors play in transition processes (Geels, 2011). In governance contexts, this omission is seen to marginalise the significance of politics and power. With its focus on how technology and innovation change over time, an under-emphasis of the disagreements on desirable directions of transitions and appropriate ways to steer such processes, leaves out explanations for why certain innovations receive political support while others do not (Geels, 2019; Köhler et al., 2019). The dichotomy of

agency distinguishing between niche- and incumbent actors in classic transition studies, is especially ill suited to understand transformation processes, based on transition experiments undertaken by established actors, in the heart of the regime (Grin, 2020).

This directly relates the critique that MLP biases its users towards bottom-up change models, where change is located outside the regime at the expense of understanding processes that are located directly in the regime or landscape (Geels, 2011). In real life, change often involves a mix of both niche processes, e.g., experiments or grassroot movements, and established systems responding to shifts and pressures. Underlaying to this issue, is the hierarchical ontology of the MLP, which has been identified as major obstacle for combining perspectives of MLP and SPT, which builds on a flat ontology (Schatzki, 2011). The conceptualisation of socio-technical systems based on institutional theory introduced by Fünfschilling and Truffer (2014), offers a more elaborated understanding of structures and agency as well as a dynamic conceptualisation of sociotechnical change, while building on a flat ontology. An institutional perspective on transition processes also allows better addressing questions of cultural discourse and framing struggles that vary in niche and regime dynamics during transition processes and directly relate to social acceptance of emerging approaches (Geels, 2019).

3. Conceptual framework

The conceptual framework of this thesis builds on the combination of the theoretical approaches outlined above. This combination allows for linking changes in the things people do with changes on system-level and, thus, is well suited to study changes in service industries like healthcare. The chapter introduces the linkages of the three main theoretical pillars: practice theory, socio-technical transition theory, and institutional theory, before defining the main elements for this thesis – the field, healthcare services as a practice, agency, and transformation of practices.

3.1. Interrelations between the theoretical pillars

While all three theoretical approaches have distinct strengths, none of them is perfectly suited to address this thesis' research problem. Practice theory provides a theoretical concept that allows understanding the micro-texture of everyday action by offering a detailed perspective on the activities of people, the understandings that shape these actions, and how material artefacts are meshed into these routinised behaviours. Yet, this micro-perspective struggles to address large-scale phenomena, tends to be remain descriptive, and being unable to offer explanatory concepts for changes on system-level (Svennevik, 2022; van Uden et al., 2024; Watson, 2012). In contrast, socio-technical transition theory excels at mapping long-term system trajectories, but tends to overemphasise structure, under-playing agency while having a bias toward bottom-up niche stories that miss change initiated within incumbent regimes (Geels, 2019; van Uden et al., 2024), factors that are central to innovation in healthcare (Barlow, 2016). Finally, institutional theory tackles power, politics and provides an agency perspective under the umbrellas of institutional entrepreneurship and institutional work (Battilana et al., 2009; Lawrence & Suddaby, 2006; Thornton & Ocasio, 2008). But in institutional theories practice-perspectives are only emerging (Smets et al., 2017), and they lack a tradition of technology–practice co-evolution.

Hence, neither of these theories alone is well equipped to study how changes in the way healthcare services are provided can contribute to transformative processes on system level. However, the combination of the approaches seems promising for capturing the interactions between micro-level change processes and the system transformation.

Subsequently, there is an increasing interest of approaches aiming to develop cross-over frameworks between SPT and transition studies observable over the last years (Kokko & Fischer, 2021; Svennevik, 2022; van Uden et al., 2024; van Welie et al., 2018). However, these approaches encounter difficulties, since existing crossover frameworks typically necessitate compromising key principles of either theory and, as a result, offer only partial integration while failing to maintain the foundational tenets of both theories (van Uden et al., 2024). The main point of critic are the conflicting ontologies (Schatzki, 2011), with SPT describing the world following a flat ontology while the MLP in transition theory builds on a hierarchical ontology. SPT claims that there is nothing outside of practices (Shove et al., 2012) while transition studies place innovation on the niche level which is outside the dominant regime. Van Uden and colleagues (2024) further identify that, with the exemption of reconfiguration, most cross-over frameworks lack understanding of traditional transition pathways (Geels & Schot, 2007) and lose the role of the macro-level landscape.

In an attempt to address these challenges, this thesis argues existing integration efforts between praxeological and institutional (Schatzki, 2021; Smets et al., 2017) as well as between socio-technical and institutional (Fünfschilling, 2014; Smink et al., 2015; Wirth et al., 2013) efforts provide a promising angle to advance the development of cross-over frameworks. In this sense, institutional theory and the vocabulary development in this theory provides the angle to advance the integration of practice and socio-technical theories.

Fünfschilling's (2014) approach interprets a socio-technical system as a special case of an organisational field which has a specific focus on technologies. It contains a range of material and cultural structures that are institutionalised and have aligned into specific field logics to various degrees. These field logics have often developed through interactions with specific technologies and, consequently, technologies are considered a key component of a field logic, co-evolving and aligning with other logics into a distinct configuration. Most pluralistic fields hold different, competing, and potentially conflicting logics whose institutionalisation and dominance in the system thus varies. In this thinking, the socio-technical regime is the most-highly institutionalised core of the system or field. A coherent regime is likely to exert a strong power over an actor's

behaviour and cognition and, thus, contribute to stable development of the socio-technical system. In contrast, a weak regime would be characterised by incoherence and instability, with competing field logics undermining the field's overall structure. However, in most empirical cases socio-technical systems will be characterised by intermediary degrees of structuration and therefore appear as "semi-coherent". While Fünfschilling's (2014) approach is highly influential in transition studies and has informed studies linking socio-technical transitions with organisational change management (Bögel et al., 2019) as well as to demonstrate endogenous regime change (Runhaar et al., 2020).

On the other hand, an "alliance" between neo-institutional theory and SPT has been suggested by Schatzki (2021) himself based on the idea that institutional orders are constellations of practices that are organised by commanding general understandings, teleologies, and rules. Or, reversing his argument that institutional logics are part of the understandings, goals and motivations that shape the way practices and bundles of practices are implemented. Further, he acknowledges that the event activity-chain nexus (Schatzki, 2019) that link changes in practices to changes in bundles and constellations, are depending on the institutional orders that are present in these bundles, ultimately making these processes political struggles. Thus, the institutional approach towards socio-technical systems helps to overcome the conflicting ontologies that limited the integration of these theories so far (Schatzki, 2011; van Uden et al., 2024) by offering a flat ontology of technological change that distinguishes novelty as degree of institutionalisation within the organisational field.

While each framework, taken on its own, leaves an analytical gap, an integration of these theoretical traditions holds the promise to provide vantage points that allow to bridging questions of scale as well as of agency. On the question of scale, SPT's offers the advantageous perspective on the granular mechanisms of element recombination (Laakso et al., 2021; Schatzki, 2019; Shove et al., 2012), while the socio-technical perspective situates those mechanisms within trajectories of building, expansion and mainstreaming of niches and the co-evolutionary dynamics of social and technological components (Fünfschilling, 2014; Ghosh et al., 2021; Heiberg et al., 2022), and institutional theory further links these shifts to the struggle of overcoming coercive forces

rooted in existing believes, rules, and logics within the organisational field (DiMaggio & Powell, 1983; Friedland & Alford, 1991; Tolbert & Zucker, 1999).

The second advantage lies in its perspective on agency, which explains how the purposive actions of individuals and organisations create, maintain, or disrupt institutions, and how they mobilise resources to transform institutionalised practices (Battilana et al., 2009; Lawrence & Suddaby, 2006). These practices are enacted and stabilised through practitioners' everyday activities and, through the accumulation of such micro-processes, can crystallise into system-level transitions (Fünfschilling & Truffer, 2014; Geels & Schot, 2007).

The benefit of such an analytic framework is that it provides an explanatory arc capable of following a concrete change, from tinkering in daily routines, through organisational legitimation and resource mobilisation, to field-level reconfiguration of socio-technical regimes, without losing either the actions of individuals or the breadth of structural transformation. In the following the main elements of the analytical framework are discussed in the context of the healthcare system.

3.2. The healthcare system as an organisational field

Building on DiMaggio and Powells (1983) definition of an organisational field, as well as of the WHOs definition of the healthcare system (Murray & Evans, 2003), an organisational healthcare field can be understood as the constellation of actors, institutions, and resources that, in the aggregate, constitute the area of institutional life dedicated to health actions. This field is a relational space (Wooten & Hoffman, 2017) that links all providers, hospitals, insurers, regulators, professional bodies, research organisations, and suppliers through shared meanings and the objective of providing preventive, diagnostic, therapeutic or rehabilitative goods and services. The field's structuration has been shaped by the sedimented biomedical paradigm, a science and technology-driven logic, (Ashcroft & Van Katwyk, 2016; Farre & Rapley, 2017), which supported professional specialisation, compartmentalisation, and technology-intensive service models, resulting in successful curative approaches but also leading to fragmentation and a lack of patient agency (Broerse & Grin, 2017). These arrangements stabilised in isomorphic expectations and legitimated an organisational design across OECD countries. At the

same time, the field is marked by institutional complexity: state, market, professional, public-health, and patient-centred logics coexist and sometimes collide, shaping how problems are framed, and which solutions are considered legitimate (Greenhalgh et al., 2018).

The field provides the institutional context for the provision of healthcare services that is shaped by these shared institutions, logics, and power relations. At the core of the field is the individual healthcare service. Following Røpke (2009), the activities of patients and healthcare professional(s) are mutually conditioned and any healthcare service cannot be delivered without the participation of both parties, thus, the interdependent relations of patients and healthcare professionals form one single practice that are shaped by field logics. The organisation of these encounters between healthcare professionals and patients gives rise to social structures of organisational approaches and resource (Bodolica et al., 2016). Following the sedimented traditional organisational healthcare model, it is the healthcare professional's expert knowledge, along with the required medical tests and treatments that primarily shapes the practice, with an emphasis on the medical problem rather than the person (Broerse & Grin, 2017; McColl-Kennedy et al., 2017). These practices are not isolated but forming practice–arrangement bundles and field-wide constellations that are bound together by chains of action (Schatzki, 2019) and, thus, show signs of dependence and co-dependence (Shove et al., 2012).

As technology, in the form of pharmaceuticals, medical devices, or infrastructure, are important cornerstones of the field, the field logics and technologies co-evolve and align into a specific configuration (Fünfschilling & Truffer, 2014; Heiberg et al., 2022). Through their routine performance, such bundles reproduce the structures of the field while also offering loci where new elements can be introduced, stabilised, or discontinued. This co-evolution of logics and technologies also affects the activities and competences of the healthcare professionals. Technological change in healthcare, such as advances in surgical practice, necessitates new competencies and depends not only on the preferences of the actors involved (Windrum & García-Goñi, 2008), but also on institutional change, since individuals function as carriers of institutions, becoming socialised within institutional fields and reproducing their underlying logics through everyday practice (Scott, 2008; Zucker, 1977). In such a context, change depends on the

ability of actors to institutionalise new logics and technologies against the field's inertia and coercive powers. Fünfschilling (2014, p. 55) describes this process as: "*institutional logics are socially created, maintained and disrupted. The more institutional contradictions are generated within a field, may this be through exogenous events that open up opportunities for agency or entirely endogenous processes of institutional work, the more the overall structuration of a field decreases and opportunity for change, based on processes of embedded agency, are provided*".

However, the field's institutional complexity and the legitimacy struggles it entails, are also a source of tensions that hinder the development and implementation of healthcare innovations (Barlow, 2016; Greenhalgh et al., 2018; Haring et al., 2022). The coexisting logics offer conflicting templates for action, so actors face divergent criteria of what constitutes good care (McColl-Kennedy et al., 2017). These deeply sedimented institutions create inertia, while coercive, mimetic and normative pressures reward conformity and penalise deviation, negatively affecting experimentation and making it harder for novel practices to gain field-level legitimacy. This is especially relevant, in the context of the search for better alternatives for chronic and community-based care, which need to escape isomorphic pressures to overcome long-standing specialisation and compartmentalisation (Broerse & Grin, 2017) one the one hand. On the other hand, these practice-based interventions are at odds with deeply institutionalised legitimacy regimes of EBM, which are optimised for linear, single-component interventions and ill-suited for complex service innovations whose effects depend on context, agency and system interactions (Greenhalgh et al., 2022).

3.3. Healthcare services as social practice

Within this field, actors are providing and consuming healthcare services. Conceptualising these services as social practices, they can be described as routinised configurations of activities, consisting of doings and saying which depend on actors' competences, that are intelligible to participants and organised by shared understandings, rules, teleologies and emotions (Knorr-Cetina et al., 2001; Schatzki, 2002; Shove et al., 2012). These practices are inseparable interwoven with material arrangements, forming what Schatzki (2019) calls practice–arrangement bundles. A distinctive characteristic of services is their inseparability, meaning that they are co-

produced in real time through the interaction between service provider and customer (Gallouj & Weinstein, 1997). Subsequently everyday healthcare practices, consisting of a series of activities like consulting, diagnosing, prescribing, counselling, referral, monitoring, are co-produced, situated encounters between healthcare professionals and patients (Røpke, 2009), which rely heavily on technologies such as diagnostic tools, drugs, and medical devices (Greenhalgh et al., 2017). As such any healthcare practice is a configuration of entangled technological components and human activities (Orlikowski & Scott, 2008). The way these practices are organised and which materialities are included depends on the understanding that is shaped by the interplay of institutional logics present in the field (Schatzki, 2021). Thus, these understandings include the goals and motivations that shape the way practices and bundles of practices as well as the symbolic and normative significance, practitioners derive from them. Following such an understanding, healthcare services are social practices consisting of three types of elements:

- Activities: The routinised bodily and mental actions, interactions, and abilities of the actors required to perform a practice and that make up the service encounter and its coordination across settings (e.g., diagnosing, prescribing, medication, teleconsulting, or patient self-monitoring). In praxeological terms, these are an array of centrally organised doings and sayings that render care intelligible to participants (Schatzki, 2001). As practice stands for actions plus organisation, activities include clinical workflows and interactions of healthcare professionals and patients that prescribe the division of labour during the delivery of care.
- Understandings: The discursive, normative, and interpretive elements that give meaning to a practice and make it a distinguishable concept (Schatzki, 2021; Shove et al., 2012). They encompass the teleologies, logics, narratives, power structures, and symbolic frameworks through which practitioners articulate, negotiate, and legitimise their roles and actions. These understandings have a dual performativity (Schulz et al., 2019), as they convey meaning by shaping professional identity, clinical roles, and societal values associated with a practice while also exerting power through the position and influence of those promulgating a particular discourse within the healthcare system.

- Materialities: Referring to the tangible and physical dimensions of a practice (Schatzki, 2002; Shove et al., 2012), objects and human activities are imbricated into socio-material practices (Orlikowski & Scott, 2008) that meld particular sets of activities with materiality. Only through this use materiality is enacted in practice. In healthcare, it is exemplified by medical devices, pharmaceuticals, and digital and physical infrastructures that in their sum provide the materiality that affords a practice (Shaw et al., 2017).

Practices do not exist alone but are bundles into sequences and interlocked with adjacent practices across settings and timescales to form constellations at field-level (Klitkou et al., 2022; Schatzki, 2019; Svennevik, 2022). Through these couplings, bundles shape one another, enabling circulation of elements and, through this circulation, the possibilities for reconfiguration. The change of practice, thus, depends on changes within these elements and their interrelations as well as the ability of healthcare professionals and patients to integrate these changes into the mundane activities of everyday healthcare practice (Smets et al., 2017). These abilities are especially salient under contemporary pressures from NCDs, that require a shift from episodic curative actions towards longitudinal coordination, self-management support, and interdisciplinary work (McColl-Kennedy et al., 2017). Further, as nothing exists outside of practices (Shove et al., 2012), the development and transformation of practice elements is a movement from proto-practices to stabilised routines, which highlights the role of practitioners and the immanent role of their agency in practices.

3.4. Agency-practice-structure relations in healthcare

Practice theories generally assume that actors and social structures are dialectically shaped at the level of a social practice (Schatzki, 2002; Shove et al., 2012; Watson, 2012) and that the seed for social change are always endogenous, emergent from practice (Orlikowski, 2002; Smets et al., 2017). Thus, as depicted in Figure 3 actors and structures exist in a recursive relationship, as the structures enable the actors to implement practices while the implementation of practices (re-)produces these structures (Giddens, 1984; Greenhalgh &

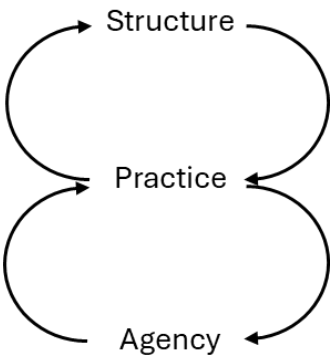


Figure 3: The recursive relations between structure, practice and agency

Stones, 2010; Stones, 2005). Actors are socialised into these structures, which describes the organisational and institutional context of agency. These structures transmit norms, shape people's immediate cognition, and resulting action (Zucker & Schilke, 2019) and at the same time provide the rules, roles, funding models, professional jurisdictions, technologies, and built environments that organise patient-healthcare professional interaction and provide legitimacy (van Raak & de Haan, 2017).

This duality between agency and structure, thus, results in a stable configuration of the healthcare field as described by Murray and Evans (2003). A change in this system, as e.g., the implementation of a novel practice, thus depends on the structures that provide the conditions for action as well as actors' ability of to recognise the opportunity and the make reflexive use of various knowledge stocks, resources, networks, and critical events (Suitner et al., 2022). This factors have been described as the external and internal social structures that shape the active agency of any actor (Stones, 2005). If changes in seemingly mundane praxis unfold via chains of actions beyond the organisation in which they started, they move from practice to field (Smets et al., 2012), thereby changing the field's structure.

In healthcare, agency is inherently distributed across a diverse set of actors, including clinical entrepreneurs, investors, regulators, healthcare policymakers, payors, healthcare professionals, and patients who operate under partly conflicting logics and values (Greenhalgh et al., 2018). These actors deploy different modes of agency to maintain or transform practice, which as a result is situated in practice bundles (Reckwitz, 2002; Schatzki, 2002; Shove et al., 2012) or embedded in institutional orders (Battilana et al., 2009; Thornton & Ocasio, 2008). Agency thus takes different forms, such as Schumpeterian entrepreneurship or institutional work (Grillitsch & Sotarauta, 2020; Lawrence & Suddaby, 2006) to effect change at the level of practices, organisations, and broader systems (Benner, 2023). However, not all actors have the same ability to act, which can partly be explained by actor characteristics. Grillitsch and Sotarauta (2020) introduced the concept of opportunity spaces, as actor-specific, place-dependent, and temporally situated circumstances that allow reconfigurations of dominant stabilities, to explain diverging development trajectories. These factors imply that opportunities are not objectively given but formed, perceived, and enacted by individuals through intentional,

purposive, and meaningful actions that occur against the backdrop of structural constraints. In healthcare field, actor's opportunity spaces are shaped by factors such as competences and preferences of professionals and patients (Windrum & García-Goñi, 2008), existing infrastructures (Saidi et al., 2020), and organisations' readiness for change (Greenhalgh et al., 2017). Further, field-level frameworks for resource allocation and evidence creation shape agentic opportunities (Barlow, 2016). However, the persistent implementation challenges and the fragmented nature of healthcare systems highlight the need for networked and system-level agency to overcome transformation barriers (La Rocca, 2018; Weber & Rohracher, 2012). Intermediary actors, like patient organisations, often play a crucial role in this regard, facilitating socio-technical transformations and steering the pace and direction of change by creating opportunities and engaging in institutional work, particularly where new working practices must be established (Boon et al., 2008; Kivimaa, Boon, et al., 2019).

3.5. Transformation of healthcare practice

Combining the insights from practice theory, institutional theory, and socio-technical systems theory necessitates conceptualising the transformation of healthcare practice as a dynamic and multi-level process that involves a co-evolutionary interplay of practice elements, institutional logics, and technologies. According to practice theory, change alters the elements and relations between the routinised activities, understandings, and materialities (Schatzki, 2019; Shove et al., 2012; Smets et al., 2017). As structured and situated arrangements, practices are always in the process of formation, re-formation, and de-formation through the making and breaking of linkages between elements. These elements, in turn, are rather stable and capable of circulating between places and enduring over time (Shove et al., 2012).

In healthcare, the organised activities like diagnosis, prescribing, treatment administration, and patient monitoring are not isolated actions but are tightly bound together with materiality in practice–arrangement bundles. These bundles are shaped by materialities, like pharmaceuticals, medical devices, and infrastructure, and the decision on which materials and activities to include are shaped by understandings in the form of norms, ethics, and teleologies that depend on field logics. A change in healthcare practice, therefore, requires introducing novel elements into these bundles through the

establishment of links with elements that previously were not part of the practice. It, however, is not relevant if this element is new to the practice or new to the world. In the past, for examples, pharmaceuticals for hypertension were introduced in the treatment of erectile dysfunction or medication for the treatment of type 2 diabetes has been used as anti-obesity medication. Important is that the introduction of such an element into a practice is feasible and legitimate (Smets et al., 2017).

Thus, practice change occurs when new connections are made within and across bundles, leading to a shift in how care is performed. However, while some innovations might be radically new, e.g., the mRNA as a vaccine platform (Kallen & Theß, 2014), their change on the level a practice might be minimal as the only element that changes is the liquid in the syringe. However, the event of introducing such an innovative solution into the healthcare field initiated a chain of reactions that rippled through society changing constellations beyond healthcare in the form of new understandings that are expressing themselves in the form of culture wars (Whitehead & Perry, 2020). On the other hand, other innovations might be modest in their novelty but transformative on the level of the practice. The introduction of telemedicine solutions, for example, requires the introduction of materialities in the form of hard- and software whose functionalities are standard in other constellations. However, in the context of healthcare practices the introduction of these materialities creates new links that require new actions from healthcare professionals and patients alike. Implementing these actions requires new competences in the form of technological literacy and healthcare literacy respectively as well as working organisational concepts, whose absence might affect the quality of the service provided. Thus, the question if healthcare systems "*dare*" (Greenhalgh & Rosen, 2021) to implement remote services depends on the legitimacy of such a system, which in turn is shaped by the institutional logics present in field and actors. This reconfiguration of an established practice-arrangement bundle, thus, depends on a chain of activities that challenge existing understandings to eventually gain wider acceptance in the field, as basis for becoming a stabilised routine within the system (Schatzki, 2019). Subsequently, such transformation of practices are non-linear, emergent and path-dependent processes which are subject to ongoing negotiation and adaptation in the context of the institutional logics that govern the field.

These processes defining what constitutes safe, high-quality and, thus, legitimate care are deeply connected to institutionalisation (Tolbert & Zucker, 1999). Following institutional theory, the gradual process through which practices are becoming widely accepted within an organisational field is a process of institutionalisation. While vis-versa, the delegitimisation of existing practices requires a de-institutionalisation process. In healthcare, institutionalisation of novel approaches is closely linked to the question of evidence. Following the biomedical paradigm this evidence in generated through the highly structured methods of EBM. If there is a convincing evidence-base, a practice is being institutionalised through practice guidelines and regulatory frameworks signal its legitimacy. However, the more complex an intervention is, the less suitable are these methods. The methods applied in this process form a hierarchy of evidence, with meta-analyses of randomised control trails at the top and so-called less trustworthy evidence as derived from case studies, mechanistic evidence, expert opinion at the bottom (Greenhalgh et al., 2022).

These processes struggle with non-pharmaceutical interventions which combine material artefacts, human behaviour, organisational directives, occupational health and safety, or the built environment and, thus, creating trustworthy evidence. Subsequently, the implementation of these praxiological interventions rely on institutionalisation processes based on institutional work and entrepreneurship (Battilana et al., 2009; Lawrence & Suddaby, 2006). Thus, healthcare professionals' agency aiming to transform practice is an important resource of institutional renewal in the healthcare field (Barlow, 2016). At the same time, in the case of rare and orphan diseases, patients and patient organisations have constituted themselves as credible participants in the process of knowledge construction (Boon et al., 2011; Rabeharisoa et al., 2014). They are what Rabeharisoa and Callon (2004) called "experts of experience" and can take crucial roles in translating people's experience into the language of science and medicine and thereby patient organisations can contribute to the governance of emerging practices and to challenge existing institutions. As such, institutional work creates opportunity spaces for transformation by aligning innovative approaches with existing organisational, regulatory frameworks, and professional norms (May, 2013a).

Further, technology is an integral part of practice and its performance in the world. This socio-material nature needs to be acknowledged and subsequently a praxiological approach to the transformation of healthcare services needs to challenge assumptions that technology, work, and organisations should be conceptualised separately (Orlikowski & Scott, 2008). A socio-technical perspective, provides a lens to interpreted the healthcare system as a specific field whose functionality and development are characterised by the co-evolution of material and social elements into a well aligned socio-technical configuration (Grin et al., 2010). Technology and other artefacts used in practices are material applications of knowledge, offering specific functions, components, or operating principles to fulfil social purposes in a specifiable and reproducible manner (Fleck, 1993a; Leonard-Barton, 1988; Skolnikoff, 1993). These materialities, may be generic, e.g., computers or smartphones, or specific to healthcare, e.g., technique, medical devices, or pharmaceuticals , require a practice lens to examine how people, as they interact with a technology in their ongoing practices, enact structures which shape their emergent and situated use of that technology (Orlikowski, 2000). Due to these co-evolutionary processes of mutual shaping of technology and activities, material elements of a practice bundle are seen as an important cornerstone of an institutional logic that co-evolve and align with other logic elements into a specific configuration (Fünfschilling, 2014). As such, material elements shape values and missions within fields, they support the organisation of practices and bundles, and they constrain or enable change by stabilising existing logics or creating opportunities for new ones, depending on their compatibility with the prevailing institutional structures of the field. The transformation of a practice, thus, can be interpreted as a co-evolutionary process between institutions and technologies within the organisation field that has implications on how practices and bundles are organised.

In this understanding, a practice bundle can be interpreted as a stable alignment of interrelated and interdependent activities, understandings, and materialities that are intelligible for participants in a specific situation or spatio-temporal context, be collectively meaningful and be recurrently performed and recognised by multiple people. The transformation of such a bundle depends on the co-evolutionary change of activities, understandings, and technologies, which in turn relies on the institutionalisation and active linking of these elements into a feasible alignment through human agency. Through

such events and activity chains, some practice elements are de-institutionalised as new ones stabilise, leading to a reconfiguration of the field. Thus, a transformation, as field-wide change, entails the decline, discontinuation, and phase-out of elements that shaped old practice bundles (Turnheim, 2022). As the healthcare field is a complex adaptive system (Greenhalgh & Papoutsi, 2019; Plsek & Wilson, 2001), that is characterised by feedback loops, unintended consequences, and emergent dynamics, such a transformation of practices is rarely linear. This transformation is emergent, as actors in the field continuously adjust and adapt to new conditions, opportunities, and challenges. It is also dynamic, as new technologies and practices reshape the boundaries of care, while institutional logics provide the normative and cognitive frameworks that stabilise or disrupt these transformations.

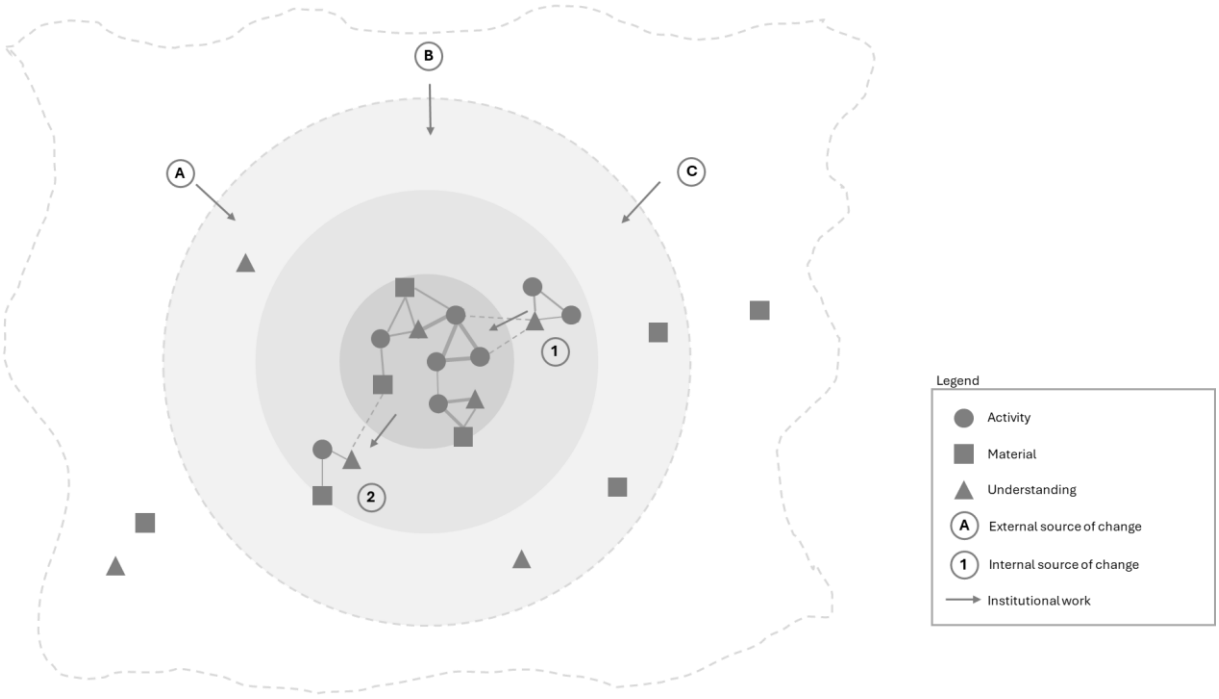


Figure 4: Dynamics of practice transformation, based on Fünfschilling (2014)

Praxiological and cross-over approaches are critiqued for lacking perspectives for such transformation processes beyond reconfigurational approaches (Laakso et al., 2021; van Uden et al., 2024) that describe the reordering and linking of practice elements as introduced above. Incorporating the institutional perspective on socio-technical change (Fünfschilling, 2014) hold the potential for a more fine-grained discussion of these processes building on the dynamic interplay of activities, understandings, and materialities. The structuration of a practice-arrangement bundle can be depicted as a

socio-technical configuration where each element is institutionalised to varying degree within the field. Figure 4 illustrates this through a radar chart, where the distance of practice elements from the centre indicates their level of institutionalisation.

The radar chart illustrates the organisational field that has different levels of coherence, whereby the middle represents the most highly institutionalised core. A practice consisting of a set of linked activities, understandings, and materials is depicted at the centre of the field, as it represents a stable bundle. According to practice theory nothing exists outside of practice (Shove et al., 2012), thus the visual slicing of the practice is a simplification, setting system boundaries on the level of a certain practice-arrangement bundle that in reality will be linked with other bundles and constellations. For example, a hypothetical diabetes care practice would be linked to other practices within the healthcare field through joint elements, e.g., infrastructure, through practitioners being part of multiple practices, or through other related practices within other fields, e.g., nutrition or mobility. The sum of all these related and unrelated practices form the highly structured practice plenum (Schatzki, 2019), which is the source of external developments akin to the landscape in MLP. Transformations occur when a practice bundle goes through a co-evolutionary change of activities, understandings, and technologies, which is graphically represented by elements moving from the core to the periphery and vice versa.

Following, Fünfschilling (2014) transition pathways can rely on internal dynamics arising from the practice or field, exogenous processes, or a combination thereof. Endogenous transformation depends on the institutional plurality and field actors, who create deploy their agency for institutional work to gradually transform the configuration of a practice. The institutionalisation of a new process following the logics of evidence-based medicine would be an example of endogenous transformation. Exogenous transformation describes processes that are shaped by gradual contextual developments, such as technological or societal shifts within the landscape or, in praxeological terms, by activity chains that arise from other bundles or constellations. While such developments involve institutional work, it is different as it is not aimed at pushing some elements to the periphery and others to the centre but rather to transform certain elements to keep the overall bundle is place. Examples could include the COVID pandemic in the form of an

external shock or aging societies as a constant pressure. Finally, a situation of exogenous and endogenous reinforcement would represent the most powerful situation in regard to its transformational potential. It arises when external shocks and internal dynamics converge to generate a crisis, enabling a new logic to displace the dominant one through effective institutional work that valorises the alternative while delegitimising the incumbent. It depends on the ability of alternative logics and, thus, on institutional work to present alternative solutions that are better suited to deal with eternal pressures. The development of patient-centred approaches for preventive services in NCD care, could be an example on such a dynamic. These pathways, however, are not mutually exclusive and may interact. Further, the institutional work needed for changing practice could also be directed to consolidate the status quo. Thus, transformations are best understood as contingent, multi-causal processes in which institutional plurality, agency, and external pressures interact to determine whether systemic transformation or stability prevails.

3.6. From research problem to research questions

This thesis addresses the overall research problem that promising service innovations in healthcare often fail to be implemented and, thus, change of established practices stalls even though they are needed to transform the system to meet the wicked challenges it faces. To link changes in routinised work practices with system dynamics, this thesis introduces a conceptual cross-over framework that combines elements of practice, institutional, and socio-technical theories, whereby the assumption is that changes in healthcare services manifest in the activities, understandings, and materialities of everyday healthcare practice bundles while systematic transformations are observable in the affording organisational and institutional structures within the field. Thus, selection among competing bundles hinges on two criteria. The feasibility of aligning activities, understandings, and materialities in situated work as well as the legitimacy of such a practice bundle in terms of its institutionalisation through norms, standards, and regulations. Together these ideas link local work routines to field dynamics. The thesis mobilises these concepts to uncover dynamics around service innovations leading to feasible new practice bundles, the selection and legitimisation of promising practice bundles during their institutionalisation within a pluralistic field, as well as the way actors

create, perceive, and act upon the opportunities that this plurality offers. Together these ideas motivate the research questions below:

- RQ1: *How is feasibility of emerging healthcare service innovations achieved?*
- RQ2: *How is legitimacy for transformative innovations established with the healthcare field?*
- RQ3: *How do actors create opportunities for transformative change within the healthcare field?*

These questions are addressed through two complementary sets of case studies. First, an RRI-based policy experiment that supported the emergence and early implementation of service innovations and, second, comparative innovation biographies that trace trajectories of service innovations and their organisational and institutional structural context. Together these data allow for observing the alignment of activities, understandings, and materiality into feasible pilots, their legitimation in the field, and the institutional work of actors aiming to generalise these practice bundles.

4. Methodological approach

The following chapter introduces the methodological approach of this thesis. It starts by explaining the background and case rational that provided the background for the data collection. The second section provides methodological considerations regarding the case studies and the approaches to data collection. The third section provides an overview of the two sets of cases and their interrelations. While the last section explains how this data, the following paper manuscripts, and the research questions relate to each other.

4.1. Background and case selection

The thesis draws on data collected in the context of the H2020 CHERRIES project. The project supported Responsible Research and Innovation (RRI) policy experiments in the healthcare sector in three European territories – in Murcia (Spain), Örebro (Sweden), and the Republic of Cyprus. The work in the project consisted of mapping and preparing the regional context, implementing the experiments, and supporting the sustainable uptake of learnings into organisational and institutional routines. To understand regional drivers and barriers during innovation processes, in each region four cases were analysed following an innovation biography approach. These innovation biographies and the experiments form the empirical core of this thesis and were amended by an extra biography case, complementing another NCD case.

These analyses align with two assumptions about transformative change in healthcare practices that guided the thesis. First, the regional level is better suited to analyse the situated processes of emergence, implementation, and generalisation of healthcare innovations because lower administrative levels are in charge of service provision in most countries (Jakubowski et al., 2018). Second, cases that address NCDs are more likely to be transformative as they require services that break with prevailing curative imperatives (Green & Lynch, 2022) that shaped current healthcare systems.

The CHERRIES regions were selected because they have a considerable degree of autonomy regarding healthcare planning. As such, these cases allow the analysis of practice-arrangement bundles and field-level rules that enable tracing practice changes and their interactions with organisational and institutional structures (Sotarauta &

Grillitsch, 2022). These arrangements are place- and path-dependent, reflecting historical specialisation, infrastructures, and professional cultures because many enabling or blocking factors, e.g., procurement, service planning, workforce training, operate regionally, the decisions shaping future practices are often subnational.

In regard to disease patterns, NCDs dominate morbidity and mortality, shifting demand from episodic cure to longitudinal management and exposing misalignments in hospital-centred, acute-care regimes (Broerse & Grin, 2017). Transforming services for NCDs therefore offers a lens on how practice reconfiguration can relieve the financial and capacity pressures OECD health systems face (Schiavone & Ferretti, 2021; WHO, 2023), while targeting the very dynamics that make transformation both necessary and difficult. Managing these conditions requires changes in the roles and activities of patients and other field actors (McColl-Kennedy et al., 2017) within existing, institutionalised practice–arrangement bundles, which makes them well suited to a practice-focused analysis. Concentrating on attempts to transform NCD care can reveal where and how practice innovations must be embedded to produce durable field-level effects.

4.2. Methodological considerations of case study research

With these two data sources, the thesis follows a case study research approach that investigates the phenomenon of healthcare service innovations within their real-world context. Case study research, generally, involves collecting a rich variety of qualitative and/or quantitative data to gain a comprehensive and nuanced understanding of complex issues. It is especially well suited to study a single or small number of cases to provide a detailed and holistic perspective. Yin (2018, p. 45–46) describes case studies as "*an empirical method that investigates a contemporary phenomenon…*" that "*relies on multiple sources of evidence…in a triangulating fashion*". In this methodological tradition, a case normally describes a concrete entity, e.g., a person, organisation, programme, policy, practice, institution, or event. Generally, case study can be designed as single- or multiple-case study and contain holistic or consists of embedded units of analyses. This thesis mixes holistic and embedded multiple case study approaches. It thus stands in the tradition of process-based studies investigating the organisational processes that determine whether and how technological innovations are adopted and assimilated into routine healthcare practice (Robert et al., 2010).

Following Yin's framework (2018), holistic multiple-case designs treat each case as an integral unit and then develop cross-case conclusions, which strengthens analytic inference and yields more robust evidence across literal and theoretical replications. To overcome shortcomings, the case study research design needs to be anchored in prior theory, specifying in advance which cases should produce similar results, and which should contrast for principled reasons. Further, the cases should be analysed individually before any cross-case synthesis. In contrast, embedded multiple-case designs add subunits of analysis within each case, e.g., multiple innovation biographies in one region, to increase analytic rigor while retaining the case as the primary unit. They risk a subunit drift, which can be mitigated by binding subunits explicitly to the parent case, reporting subunit results within cases, and conducting cross-case inference strictly via replication logic rather than aggregation.

As mentioned above, the thesis builds on two principle sets of case studies. The ones derived from the policy experiments and the innovation biographies. First, the experiments are holistic multiple-case designs that treat each region as an integral unit. The experiments, further, are participatory action research processes (Baum et al., 2006; McIntyre, 2008) that combine research with action and participation in the field and hence builds on a collaboration with practitioners (Gunbayi, 2020). The rationale of such experiments is to aim at understanding the world through the attempt of changing it. Thus, it combines the dual objective problem-solving and knowledge-building through processes doing, using and interacting (Baum et al., 2006; Hult & Lennung, 1980; Jensen et al., 2007). Starting from a field-level problem, the process is a collective, self-reflective inquiry that researchers and participants undertake to understand and improve the practices in which they participate (Baum et al., 2006). This process provides an opportunity to create transformative knowledge through experiential learning (Moon, 2004; Urmetzer et al., 2020), which contributes to a better understanding of change processes within practice and field. This process has been supported through formative monitoring and evaluation (Holtrop et al., 2022; Molas-Gallart et al., 2021) as well as through an overall impact assessment, that aimed capturing dimensions of transformative change within the regional healthcare and R&I systems (Colonnello et al., 2023). Details on this can be found in section 5.3 as well as in Colonnello et al. (2023).

Second, the innovation biographies build on a embedded multiple-case study research design (Yin, 2018) that aims to contrast the development trajectories between selected regions by treating innovation cases as units of analysis. The framework allows to conceptualise innovations not as isolated event but as situated within broader development trajectories, shaped by institutional logics, organisational practices, and technological affordances, allowing to identify patterns, causal mechanisms, and divergent pathways (George & Bennett, 2005). The methodology of innovation biographies (Butzin & Widmaier, 2016; Suitner et al., 2022) is designed to trace the dynamics of knowledge generation and combination within concrete innovation processes by reconstructing their biographies from initial idea to implementation. Centring the innovation, the approach combines a combination of qualitative techniques, most notably document analysis, narrative interviews, and secondary interviews for validation and triangulation. A first case description derived from document analysis provides a first understanding and a stakeholder list of the case. Narrative interviews with central actors, covering the idea, implementation process, institutional context, and impacts, provide detailed accounts of the innovation trajectory. While secondary interviews were used to understand the processes in its spatio-temporal context. This triangulation allowed uncovering the social relations and contextual conditions shaping innovations and trace how knowledge is combined across organisational and sectoral boundaries. Details on this can be found in section 7.4.

Third, as one of the innovation biographies addressed diabetes, the most common NCD, and seemed particularly interesting, a second diabetes case has been identified and analysed following the innovation biography approach. The two diabetes-related innovation biographies represent a holistic multiple-case designs, that is explained further in section 6.4.

4.3. The cases

The application of these approaches resulted in two sets of cases that are mobilised to answer the research questions. The data collection and analysis of these cases is explained in detail in the paper manuscripts presented in part II of this thesis.

The experiments

The first set of cases are the policy experiments conducted in the CHERRIES project. The policy experiments consisted of three main steps: 1) a Call for Needs, 2) a Call for Solutions, and 3) co-creation and testing of the Solution (see also section 5.3). It built builds on ideas stemming from RRI (Stilgoe et al., 2013) and transformative innovation policy (Schot & Steinmueller, 2018) and combines bottom-up demand articulation, pre-commercial procurement, with open innovation and co-creation. During the first stage, the Call for Needs, healthcare professionals and patients were asked to report issues within or connected to the healthcare system that are affecting either the healthcare service delivery quality or are creating avoidable costs (Uvhagen et al., 2021). The Call for Needs, thus, was an open and inclusive reflection exercise to identify singular requirements. Regional Selection Committees selected one Need (Moyseos, 2021) and either appended technological and organisational requirements or aggregated multiple Needs to address a shared underlying demand (Boon & Edler, 2018).

The Call for Solutions stage was a functional pre-commercial procurement process. The implementation of this challenge-oriented innovation instrument required significant capabilities (Uyarra et al., 2020), which, thus, were organised through the project that added a temporal organisational structure to the regional innovation systems. The Call articulated the innovation problem, the co-creation requirement, and the evaluation criteria, striving to be concrete enough for proposals to align with the local challenge while remaining open enough to accommodate diverse approaches (Moyseos, 2021; Raso, 2021). The Call supported the co-creation of a proposed Solution with up the EURO 50,000. Finally, a Solution Provider was selected and co-creation teams consisting of the Solution Provider, regional partners, relevant stakeholder, healthcare professionals were assembled. These teams agreed on a series of exchange formats over the 10-month implementation period to develop and test the new approach. The main objective of the co-creation process was to ensure that patients' and healthcare professionals' expectations are represented in the Solution and that the challenges of aligning of practice elements into a working configuration were anticipated.

During this process, data has been collected through documentation, formative evaluation, and interviews. First, throughout the regional experiments, project partners

systematically documented key decisions, challenges, and developments, producing grey literature in the form of project deliverables. Second, the formative evaluation process enabled a continuous reflection on implementation progress (Holtrop et al., 2022; Molas-Gallart et al., 2021), stakeholder engagement, incl. questions of gender, systematic power dynamics and other RRI dimensions. This continuous assessment was implemented through a total of 12-13 bimonthly experiment monitoring sessions for each region respectively, which supported both the adaptation of interventions and data generation, allowing for credible contextualisation (Holtrop et al., 2022). Third, semi-structured interviews were conducted with key stakeholders, including municipal representatives, healthcare professionals, and participants involved in the co-creation process during evaluative online workshops and evaluative conversations during on-site visits. Each interview took about 60–120 minutes, included informed consent procedures, and was audio-recorded for later verbatim transcription. The collected data, data analysis, and results are described in section 5.3.

The innovation biographies

For the innovation biographies, the starting point was an initial mapping exercise that aimed at selecting four cases per region. CHERRIES project partners in Murcia and Örebro, representing the healthcare systems of other central actors within the healthcare field, collected a total of 27 cases. Recognising Yin's (2018) warning against forcing rigid case selection logics, the selection strategy focused on sampling four cases for each region that balanced technological and social innovations while excluding overly nascent, redundant, or failed cases. Further, the mapping included interesting cases for NCDs beyond CHERRIES and eventually a diabetes case from Austria has been included in the analysis. Table 1 provides an overview of the selected cases.

Table 1: Innovation cases analysed through the innovation biography approach

Project code	Description
Murcia 1	The FICHe project pilot, Neuro-at-home, aims at supporting physical rehabilitation of patients through an ICT platform that can be used in a clinical setting or at patients' homes. The platform supports personalised treatment and training plans for patients and gives clinicians the opportunity to follow a higher number of patients.
Murcia 2	The DM4ALL tool, developed during the H2020 project ProEmpower, is a digital healthcare solution that supports diabetes patients in collecting data as a basis for self-management and healthcare professionals to follow and interact with their patients remotely, thus reducing the need for face-to-face meetings.
Murcia 3	The Deep Diver pilot uses Natural Language Processing algorithms on electronic health records to identify Asbestos-related occupational diseases. The algorithms flags

	healthcare records for review with the aim to support patients in receiving compensation and shifting the costs of treatment to employer financed insurances.
Murcia 4	The EPICO pilot is an App for epileptic patients that aims at improving the patient-doctor communication and supports the self-management of patients. It seeks to improve the patient-doctor relationship through continuous engagement and monitoring, with the aim of preventing crisis and seizures.
Örebro 1	The Social Investment Fund (SIF) of the Örebro Municipality support the experimentation with new practices and transforms the provision its public services. It introduced a bottom-up change management approach that introduces output legitimacy as contrast to the prevailing input legitimacy of public services.
Örebro 2	The SIF project "*Samverkan för teckenspråkiga*" (Collaboration for sign language practitioners) project, supported the labour market integration of people with hearing and cognitive impairment in cooperation with the Activa Foundation, a local CSO. The project resulted in a transformation of public services for this target group.
Örebro 3	The *Tillsammans för alla barns bästa* project, aims to explore the transferability of the Scottish GIRFEC (Getting It Right For Every Child) approach to Örebro. It aims to create an integrated case management on the interface of school, social, and healthcare services, as an early intervention that prevents public expenditure later in life.
Örebro 4	The Rehabiliterande Arbetssätt project supports the transition towards close care. The approach moves from compensating for an individual's lack of abilities to an empowering and rehabilitative approach, which supports a good, healthy and independent life. It builds on output legitimacy and empowering of care providers.
Vienna 1	The Wienerberg Diabetes Centre provides an organisational innovation within the Viennese healthcare system. The detached ambulatory centre offers guideline-based diabetes care with the aim to shift services from hospitals to such centres and through the upgrade of auxiliary staff while improving the costume-orientation of the service.

Based on this case selection, project documentation and strategic materials were analysed to establish initial case descriptions and identify key actors. The interviews with these actors were the central source to reconstruct the trajectory of these innovations by eliciting narrative accounts that cover the key phases of their biography. The guidelines start with a personal background, situating the respondent's role and perspective within the innovation process. A section on motivation explores the underlying problems and drivers of the project, as well as the sources of inspiration, thereby uncovering the contextual and cognitive origins of knowledge creation. The idea dimension probes the novelty of the project in technological, organisational, and institutional terms, identifying the specific solutions it introduces. Questions on implementation capture the temporal unfolding of the project, critical turning points, and encountered barriers, which are central to the biographical, time–space perspective of the method. The actors and networks section maps the evolving constellation of stakeholders, their roles, and the knowledge flows that shaped the innovation, aligning with the method's emphasis on qualitative network analysis. The impact dimension situates the innovation's anticipated and actual outcomes, while reflective closing questions invite respondents to highlight

unexpected dynamics and to recommend further interview partners, enabling snowball sampling.

In total, conversations with 18 interviewees that had a central role in these cases have been held. An additional 35 conversations covered the regional dimensions of the healthcare and innovation field were held by CHERRIES researchers. These interviews were recorded for later verbatim translation. The analysis of this data is described in sections 6.4 and 7.4.

4.4. Links between data, paper manuscripts and the research questions

These two sets of cases were analysed in order to answer the research questions outlined in section 3.6. The following Figure 5 illustrates the relations between data sources, paper manuscripts, and the research questions of this thesis. Each paper is positioned to answer one primary question while two also contributing secondary evidence to the others.

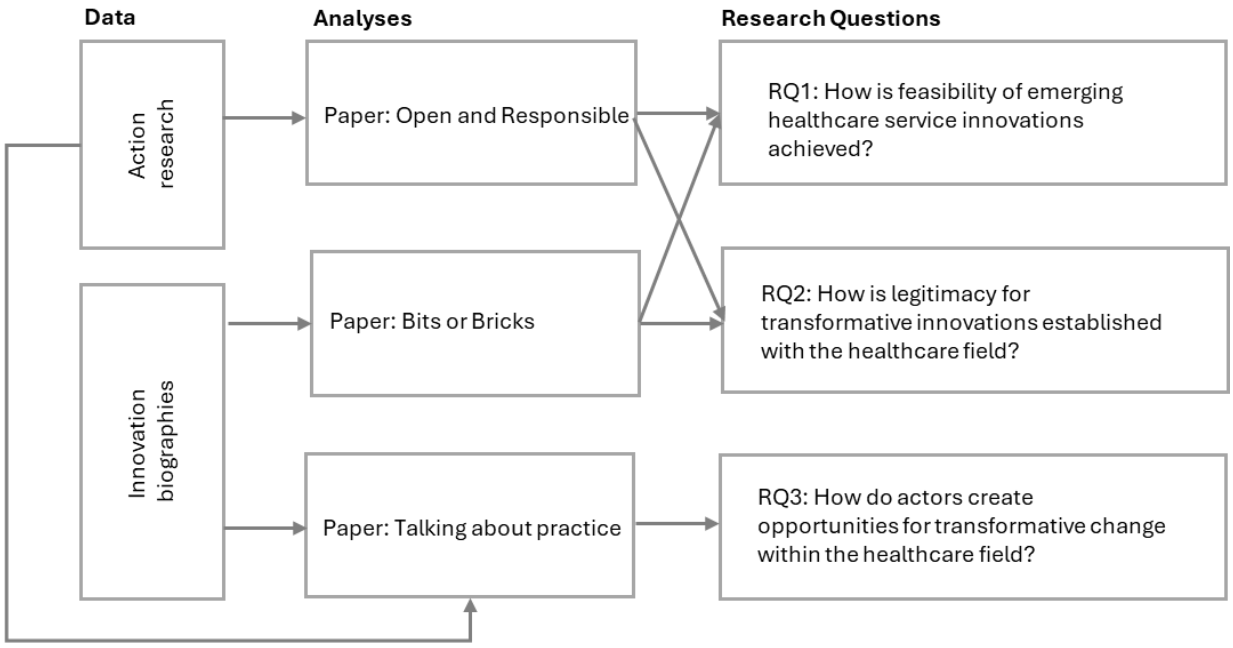


Figure 5: Linkages between data, analyses, and research questions

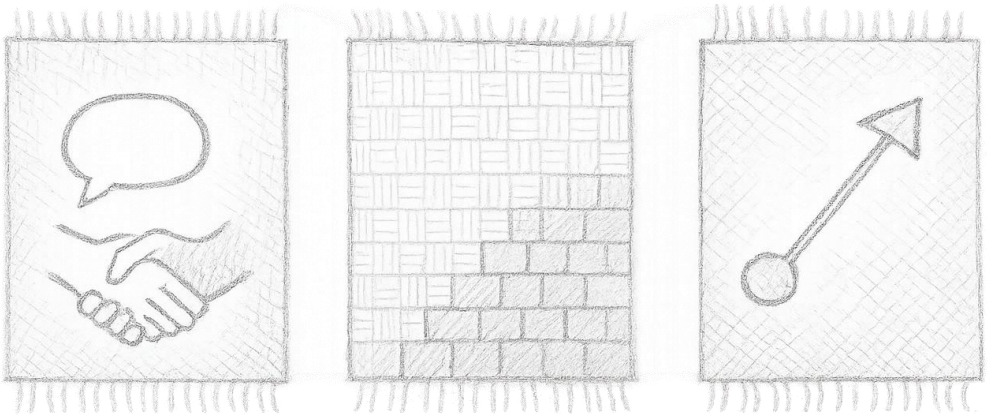
The first paper, *Open and responsible*, is the primary vehicle for answering RQ1. It builds on the experriment data collected in Örebro and Cyprus and shows how feasibility is produced through structured participation that aligns practice elements into a viable bundle. The stage-gate design makes visible the decisions through which actors specify

problems, appropriate solutions, and the co-creative process of developing and testing feasibility of the bundle. In this way, Open and responsible delivers the main answer to RQ1 and at the same time foreshadows the demands of RQ2 by showing where legitimacy work must pick up once pilots conclude.

The second paper, *Bits or Bricks*, builds on the innovation biography cases and is addresses RQ2 through a comparative analysis of two trajectories in diabetes care. Both cases connect feasibility to legitimacy by identifying the institutional conditions for spread, including reimbursement instruments, scope of practice rules, and evidence models. Hence, the *Bits or Bricks* paper provides a granular account of the feasibility-legitimacy relation and explains the frailty of innovation pilots during the generalisation process. With the temporal perspective on emergence, implementation, and reconfiguration it further contributes to RQ1 and further develops the vocabulary of for technological, organisational, and institutional concepts, which are identified in *Open and responsible*.

The third paper, *Talking about practice*, is the primary vehicle addressing for RQ3. Building on the innovation biographies as well as the participatory action research cases, the paper examines how actors create opportunities for transformative change by widening regional opportunity spaces and by aligning narratives, resources, and rule systems. The paper shows that agency for transformative change involves intermediary actors carefully constructing the conditions under which certain practice bundles become selectable. Together, these three papers address the three research questions in the context of regional healthcare system with a focus on the wicked challenges in the nexus of demographic change, system structures, and inefficient innovation frameworks.

Part II



5. Open and responsible: Co-production of feasibility in healthcare service innovation

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Abstract

Better understanding healthcare service innovation is essential for addressing mounting sectoral challenges and improving service quality. However, existing frameworks lack systematic approaches capturing how feasibility for innovative services is established. We argue that bridging this gap requires focusing on the actions and interactions of healthcare professionals and patients in healthcare practice. Building on Social Practice Theories, we characterise healthcare service innovations as interrelated activities, understandings, and materialities, and examine how Responsible Research and Innovation (RRI) can systematically support the alignment of these practice elements. Drawing on RRI policy-driven experiments implemented in Swedish Örebro and the Republic of Cyprus, we find that healthcare service innovation is contingent upon a multifaceted interplay of technological, institutional, and organisational change in complex adaptive systems. In this context, RRI-driven co-creation processes are an effective approach to achieve an alignment-in-use, which indicates the feasibility of a novel practice bundle. However, to achieve lasting impact, a legitimisation through sustained organisational and institutional support is crucial. These findings offer insights for advancing both theory and practice of healthcare service innovation.

5.1. Introduction

Healthcare systems face wicked challenges of aging populations, rising instances of non-communicable diseases, resource constraints, and workforce shortages which necessitate significant changes in the way healthcare practices are delivered (Broerse & Grin, 2017). While decision-makers recognise the potential of innovation in addressing these challenges, most healthcare innovations are never adopted (Barlow, 2016; Greenhalgh et al., 2018; Zullig et al., 2024). This is partly due to the nature of healthcare innovations, which are rarely discrete products but integrated configurations of new

technologies, organisational changes, and service model innovations that introduce misalignments into established service architectures. (Barlow, 2016; Coelho Rodrigues et al., 2024). Consequently, moving beyond small-scale pilot initiatives requires that innovations are effectively aligned with and integrated into the routine workflows of healthcare professionals, their interactions with patients, and the organisational and material infrastructures that afford these processes (Greenhalgh et al., 2017; May, 2013a).

Thus, any implementation necessitates an alignment of various social and technical dimensions into an operational configuration (Coelho Rodrigues et al., 2024; Shaw et al., 2017) as well as the investment of generative agency of various actors forming the selection environment (Greenhalgh et al., 2017; May, 2013a; Philipp & Amanatidis, 2025; Windrum & García-Goñi, 2008). While numerous innovation frameworks have been proposed (Greenhalgh et al., 2017; May & Finch, 2009), the healthcare innovation literature still tends to privilege technological, economic, or organisational dimensions and lacks systematic approaches that take the demand side seriously and prioritise innovation for service improvement (Barlow, 2016; Greenhalgh et al., 2018; Marjanovic et al., 2020). To address this gap, Responsible Research and Innovation (RRI) for healthcare (Jansma et al., 2022; Lehoux et al., 2022; Pacifico Silva et al., 2018) can be mobilised to respond to calls for deploying practice-perspectives and co-design principles in healthcare (Shaw et al., 2017). With its anticipatory and responsive aspects, it holds the potential for supporting a demand driven approach, creating innovations of greater societal value, and overcoming structural misalignments of novel approaches (Coelho Rodrigues et al., 2024; Greenhalgh et al., 2018; Jansma et al., 2022).

We argue that capturing the alignment process during service implementation necessitates a perspective putting the actions and interactions of healthcare professionals and patients at the centre. Thus, we build on a Social Practice Theory (SPT) perspective (Schatzki, 2002; Shove et al., 2012; Smets et al., 2017), which allows capturing the multiple interrelated and interdependent activities of participants, its material and institutional affordances in a specific situation or spatio-temporal context (Feldman & Orlikowski, 2011). Conceptualising practice as a bundle of interlinked *activities*, *understandings*, and *materialities* (Schatzki, 2002; Schulz et al., 2019), we

adopt a reconfigurational perspective on social change (Coelho Rodrigues et al., 2024; Geels et al., 2015; Laakso et al., 2021), to understand how institutions, actors, practices, and constituent elements of practices are aligned into a feasible bundle during service innovation processes.

Equipped with such a SPT framework, we study the innovation process for healthcare service improvement in the context of RRI-based policy experiments that we conducted in the context of the H2020 project CHERRIES. The experiments followed a three-stage approach consisting of Need identification, selection of a Solution, and a co-creative development and testing of the Solution that allowed capturing the reconfiguration of practice elements in different stages of a healthcare service innovation process. In this context, we aim to answer the research questions: *How is feasibility of emerging healthcare service innovations achieved?* Through the analysis of our experiments, we demonstrate that healthcare service innovation is contingent upon a multifaceted interplay of technological, institutional, and organisational change in complex adaptive systems. By structuring solution development, coalition formation, institutional work, and practice alignment, the experiment design proved to be effective for establishing local feasibility but insufficient for the broader problem of generalising pilots.

The remainder of the paper is structured as follows. We begin by examining healthcare innovations as changes in practice configurations and introducing the key elements of SPT. We then explore various concepts of change relevant for the implementation of innovation, focusing on their applicability in the healthcare context. The third section introduces our experiment design and methodology. Building on this, we discuss the experimental development of healthcare service innovation in the Swedish Örebro region and the Republic of Cyprus. To conclude, we discuss the findings and the implications for further research and healthcare policymaking.

5.2. Healthcare innovation as change in practice bundles

5.2.1. Social practice theories and the elements of a healthcare practice

Healthcare practices can be seen as a co-produced service between patients and healthcare professionals, which rely heavily on technologies such as diagnostic tools, drugs, and medical devices (Greenhalgh et al., 2017; Philipp & Amanatidis, 2025; Røpke,

2009). As such any healthcare practice is a configuration of entangled technological components and human activities (Orlikowski & Scott, 2008) that shape the enactment of preventive, diagnostic, therapeutic, or rehabilitative services (Broerse & Grin, 2017; Shaw et al., 2017). These encounters give rise to the social structures that constitute the constraining and enabling forces through which healthcare systems are altered and reproduced over time (Bodolica et al., 2016). Social change within this practice field, thus, requires purposive changes in a complex adaptive system (Greenhalgh & Papoutsi, 2018) and depends on the management of highly organised, institutionally sanctioned, and systematically regulated changes in the structure and delivery of services (May, 2013a).

SPT, conceptualising human activity as organised in bundles of practices, provides a theoretical framework to discuss this mutual constitution of actors, practices, and social structures. It assumes that actors and social structures are dialectically shaped at the level of a social practice (Schatzki, 2002; Shove et al., 2012; Watson, 2012). Thus, the world and its phenomena are continually generated, reinforced, and transformed by the situated and recurring nature of everyday activities, practices and bundles of practices (Schatzki, 2002; Smets et al., 2017). Subsequently, practices are understood as arrays of human activity centrally organised around shared practical understanding and shaped by the material affordances of technologies (Smets et al., 2017). As such any healthcare practice is can interpreted as the elements and linkages between human *activities*, *understandings*, and *materiality* with these categories capturing the functional, discursive, and physical articulation of each practice (Schatzki, 2002; Schulz et al., 2019). Such a socio-material understanding acknowledges the inherent inseparability between the technical and the social (Orlikowski & Scott, 2008).

The *activities*, as the combination of Schatzki's (2002) doings and sayings and the competences as described by Shove et al. (2012), are the bodily and mental activities, interactions, and abilities of the actors required to perform a practice (Reckwitz, 2002; Schatzki, 2002). Generally, in SPT practice stands for activities and their organisation (Rabadjieva & Zirngiebl, 2023) and thus includes the clinical workflows and interactions of healthcare professionals and patients that prescribe the division of labour during the delivery of care (Røpke, 2009). The *understandings* are the discursive, normative, and interpretive elements that give meaning to a practice and make it a distinguishable

concept (Schatzki, 2021; Shove et al., 2012). They encompass the language, narratives, and symbolic frameworks as well as highly institutionalised forms of professional norms in the form of protocols and clinical guidelines through which practitioners articulate, negotiate, and legitimise their roles and actions. These *understandings* have a dual performativity (Schulz et al., 2019), as they convey meaning by shaping professional identity, clinical roles, and societal values associated with a practice while also exerting power through the position and influence of those promulgating a particular discourse within the healthcare system. *Materiality* refers to the tangible and physical dimensions of a practice (Schatzki, 2002; Shove et al., 2012). These objects and human *activities* are imbricated into socio-material practices (Orlikowski & Scott, 2008) that mesh particular sets of *activities* with *materiality*. Only through this use *materiality* is enacted in practice. In healthcare, it is exemplified by medical devices, pharmaceuticals, and digital and physical infrastructures that in their sum provide the materiality that affords a practice (Shaw et al., 2017).

5.2.2. Responsible reconfiguration processes in healthcare practice change

Following Shove et al. (2012), shifts in the practice elements or the linkages between them are the main source of change in practice. Further, changes in the field, as constellations of related practices, or in the carriers of the practice can be a sources of change (Smets et al., 2017; Watson, 2012). But generally, the routines of practitioners are key to understanding practice dynamics as they are generative, requiring actors to either actively continue or change their operations (Smets et al., 2017). Thus, stability and change are different outcomes of the same dynamic (Feldman & Orlikowski, 2011) and both the effortful accomplishment of the multiple actors that are engaged in a practice. However, stability in practices emerges from routinisation and the mutual reinforcement of practices and social structures, which leads to seeing stability and reproduction of practices as the norm (Svennevik, 2022).

Subsequently, the change conceptualisation in SPT can profit from exchanges with such concepts as present in innovation, institutional, or socio-technical theories. Generally, innovation describes the use of a new concept, while their diffusion is assumed to be coordinated by market factors (Rogers, 1962). However, the scaling and embedding of

healthcare innovations depend on implementation processes resulting in a routine use of the innovation within a certain practice (Coelho Rodrigues et al., 2024; Greenhalgh et al., 2017; May, 2013a). As such implementation depends on the mutual adaptation of work, technology, and organisation (Leonard-Barton, 1988; Orlikowski & Scott, 2008), to overcome the misalignments that innovations typically introduce in a system's organisational and institutional structures (Coelho Rodrigues et al., 2024; Philipp & Amanatidis, 2025). This reconfiguration process (Geels et al., 2015; Laakso et al., 2021), is a co-evolutionary alignment process that changes system components in a way that gradually alters a system's architecture, resulting in a configuration of old and new elements. As such, alignment processes are organic, collaborative processes in which actors attempt to impose order and direction on structural, technical, or institutional misalignments (Coelho Rodrigues et al., 2024; May, 2013a).

These processes of change are implicitly coordinated by communities of practice (Bridwell-Mitchell, 2016) and complex selection environments (Greenhalgh et al., 2018; Windrum & García-Goñi, 2008) that require careful reconciliation of conflicting sectoral logics and values (Pache & Santos, 2013). In this context, the theory and practice of RRI can play a role in facilitating an alignment of logics and values as a basis for designing, financing, producing, distributing, and using innovations of greater societal value (Pacifico Silva et al., 2018). Generally, RRI can support better addressing the complexities of providing high-quality care (Lehoux et al., 2022), including the experiential knowledge of patients to develop solutions that reflect diverse realities (Boon et al., 2008; Monteleone, 2020; Rabeharisoa et al., 2014), or translating between different actor groups (Amanatidis & and Børsen, 2024). Especially co-creation processes have become increasingly important, to enrich legitimacy, ensure inclusivity, and anticipate societal needs (Jansma et al., 2022).

5.2.3. Reconfigurational alignment: our analytical framework

Building on these theoretical concepts and understanding of healthcare practice and change, we conceptualise healthcare services as configurations of *activities*, *understandings*, and *materialities* that are co-produced through the interactions of healthcare professionals and patients (Røpke, 2009; Schatzki, 2002; Shove et al., 2012). We further understand healthcare service innovation as a reconfiguration processes

(Geels et al., 2015; Laakso et al., 2021) that integrates new elements into these practice configurations. These de- and realignment processes are shaped by the generative agency that maintains or alters practices' elements, linkages, and affording structures (May, 2013a; Philipp & Amanatidis, 2025; Shove et al., 2012). In other words, practice change depends on the integration of new or updated components or the change of the relational architecture of these elements. Figure 6 illustrates this understanding.

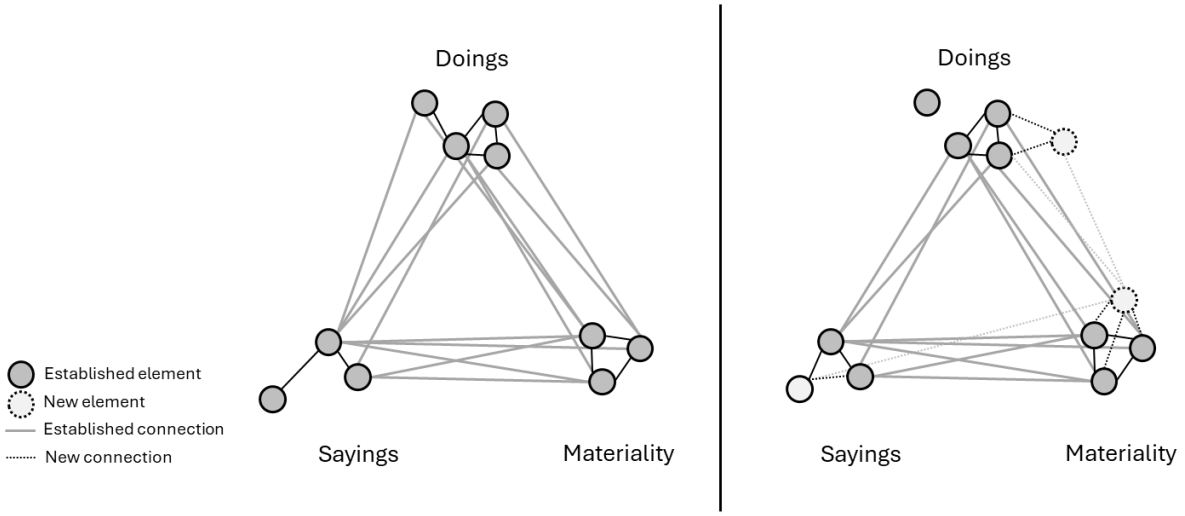

Figure 6: Changes in practice bundles through the implementation of new elements and connections

However, these elements are not homogeneous and are affected by different change dynamics. As outlined above, *understandings* transport the values and meaning shaping the rules, terminologies, and narratives that frame professional identity and practice (Roysen & Mertens, 2019; Schatzki, 2021; Welch, 2020). Hence shifts in *understandings* signal institutional change (Micelotta et al., 2017; Phillips et al., 2004; Tolbert & Zucker, 1999) that embed new norms and expectations into the practice field. Emerging concepts, like patient-centred care or patient empowerment (McColl-Kennedy et al., 2017), are examples of changing *understandings* that open spaces for disputing existing approaches and suggesting novel solutions (Zietsma & Lawrence, 2010). These *understandings* become codified in protocols and clinical guidelines, shaping *activities* and *materialities*.

Similarly, the development of new diagnostic devices or pharmaceuticals through technological change (Barlow, 2016) represent new *materialities*, which need to be implemented into clinical services by establishing trust and legitimacy among stakeholders and aligning their use with existing professional roles and competencies

(Greenhalgh et al., 2017; May, 2013a; Windrum & García-Goñi, 2008). Finally, the adoption of new workflows, routines, or roles reconfigure the *activities* of a practice. These represent organisational changes which might be at odds with norms, expectations, and rules inscribed in a practice's *understandings* and practitioners convictions, or generally structural and agential forces (Bridges et al., 2007; Greenhalgh & Papoutsi, 2018; Rosenbaum et al., 2018).

Equipped with this analytical foundation, we address the existing research gap concerning systematic approaches to innovating for service improvement and to understand how RRI-based approaches can be instrumental in aligning healthcare practice elements into feasible bundles.

5.3. Experiment design and methodological approach

5.3.1. Experiment design

We aim to answer our research questions, in the context of policy experiments that we implemented in the context of the H2020 project CHERRIES. The project's RRI-based research design, together with the preceding theoretical account, constitutes the study's conceptual framework. The primary objective of the experiments was to create open interfaces between the regional healthcare innovation systems and society for inclusively developing healthcare service innovations. A central consideration was to "*do RRI*", in an instrumental way, aiming to design innovations of greater societal value (Pacifico Silva et al., 2018). Thus, the experiment addressed the four RRI dimensions of anticipation, reflexivity, inclusion, and responsiveness (Stilgoe et al., 2013) through three stage-gate phases (Pietzsch et al., 2009), aiming to develop and test new healthcare practices in real-life settings. The three stages are initiated through a Call for Needs, a Call for Solutions, and a co-creative development and validation of the Solution (see. Figure 7).

During the first stage, the Call for Needs, healthcare professionals and patients were asked to report issues within or connected to the healthcare system that are affecting either the healthcare service delivery quality or are creating avoidable costs (Uvhagen et al., 2021). The Call for Needs, thus, was an open and inclusive reflection exercise through a user- or citizen-led approach to identify singular requirements (Naylor & Wellings, 2019). Regional Selection Committees, consisting of a gender-balanced group of experts

from regional healthcare and innovation systems, selected one Need per region (Moyseos, 2021) and either appended technological and organisational requirements or aggregated multiple Needs to address a shared underlying demand (Boon & Edler, 2018).

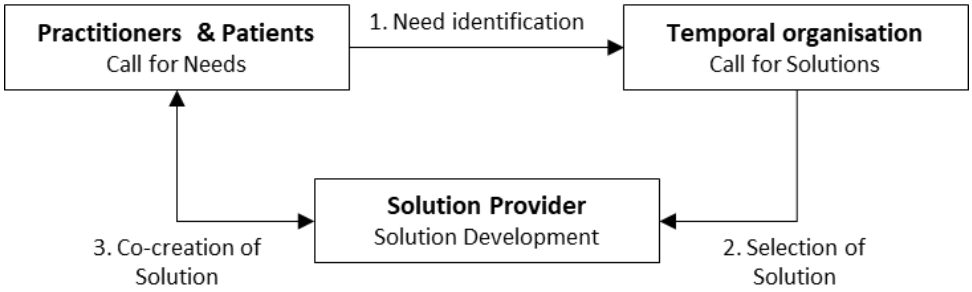

Figure 7: The experiment design in the CHERRIES project

The subsequent Call for Solutions stage was a functional pre-commercial procurement process. The implementation of this challenge-oriented innovation instrument required significant capabilities (Uyarra et al., 2020), which, thus, were organised through the project that added a temporal organisational structure to the regional innovation systems. The Call articulated the innovation problem, the co-creation requirement, and the evaluation criteria, striving to be concrete enough for proposals to align with the local challenge while remaining open enough to accommodate diverse approaches (Moyseos, 2021; Raso, 2021). The Call supported the co-creation of a proposed Solution with up the EURO 50,000, was open for two months and disseminated regionally and European level.

Finally, a Solution Provider was selected and co-creation teams consisting of the Solution Provider, regional partners, relevant stakeholder, healthcare professionals were assembled. These teams agreed on a series of exchange formats over the 10-month implementation period to develop and test the new approach. The main objective of the co-creation process was to ensure that the expectations of both patients and healthcare professionals were meaningfully reflected in the Solution, and that the potential consequences of its integration into healthcare practice were carefully anticipated.

5.3.2. The methodological approach

This experimental approach is deeply rooted in participatory action research (PAR). The key principles of PAR experiments are a collective commitment to addressing a problem, engaging in reflective inquiry, taking joint action to find practical solutions, and building

alliances between researchers and participants throughout the research process (McIntyre, 2008). It combines the dual objectives of problem-solving and knowledge-building through doing, using, and interacting processes (Baum et al., 2006; McIntyre, 2008). The project's participatory approach ensured that knowledge production was closely tied to real-world challenges and stakeholder-driven change. Throughout the regional experiments, these processes were closely monitored and evaluated, producing the empirical materials that form the basis for the following analysis.

This data collection involved process documentation, formative evaluation, and interviews. First, throughout the regional experiments, project partners systematically documented key decisions, challenges, and developments, producing grey literature in the form of project deliverables. Second, the formative evaluation process enabled a continuous reflection on implementation progress (Holtrop et al., 2022; Molas-Gallart et al., 2021), stakeholder engagement, incl. questions of gender, systematic power dynamics and other RRI dimensions. This continuous assessment was implemented through a total of 14 bimonthly experiment monitoring sessions (BEMS) for each region respectively that supported both the adaptation of interventions and data generation, allowing for credible contextualisation (Holtrop et al., 2022). Third, a total of 22 semi-structured interviews were conducted with key stakeholders, including municipal representatives, healthcare professionals, and participants involved in the co-creation process during evaluative online workshops and evaluative conversations during on-site visits. Each interview took about 60–120 minutes, included informed consent procedures, and was audio-recorded for later verbatim transcription.

For the data analysis, a deductive coding approach was employed, guided by the practice dimensions of *activities*, *understandings*, and *materiality* as defined in the research concept. This approach enabled us to categorise and analyse the data in relation to these three analytic dimensions, ensuring a structured examination along the experiment stages and the analytic practice dimensions. This framework allows for a systematic comparison of how interventions were implemented, how they were discursively framed by stakeholders, and how material elements shaped the process.

5.4. Experimental co-production of new healthcare practices

5.4.1. Breaking involuntary loneliness in rural Sweden – the Örebro case

In the rural Swedish region of Örebro County, the project engaged with a healthcare system in which the County itself serves as the primary provider, operating several healthcare centres and three hospitals with around 8,000 employees, serving a population of approximately 300,000 inhabitants. At the national level, governance is largely coordinative, while the organisation of regional health and care services is characterised by collaboration between regional and municipal authorities. This strong cooperative culture extends beyond public institutions and includes Civil Society Organisations (CSOs), which are actively involved in this practice field. The CHERRIES project team consisted of the regional development unit of the Örebro County and the Activa foundation, a CSO working with ill and disabled people. Both organisations are deeply embedded in the Partnership for Social Innovation (PSI), a regional network of more than 40 entities that tackles social problems and societal exclusion (PSI, 2021). While the local CHERRIES team could draw on this strong regional network [BEMS-Ö2], they were facing a healthcare system that is characterised by fragmented services and siloed responses, making inter-organisational collaboration difficult.

In this context, this collaborative culture was deliberately used to shape the CHERRIES experiment and challenge the healthcare system by "*inviting parts of the society, which have been excluded earlier, the civil society and the social economy*" [ÖI3]. Thus, the PSI provided a "*really good platform for the extension of this project*" [ÖI1] and fostering societal engagement emphasising inclusivity, reflexivity, and responsiveness in addressing territorial healthcare challenges. Thus, in the initial phase of the project the PSI was used to forge an alliance with two further CSOs, as well as the municipalities of Degerfors, Karlskoga, and Laxå while identifying demographic change as a core regional challenge. Hereafter, the Call for Needs was complemented with workshops in these municipalities, as regional partners had the feeling launching the Call for Needs through a complex procurement-logic driven approach did not align with local engagement routines and culture [BEMS-Ö3]. The submission of only six Needs during the Call, despite strong interest in the workshops, confirmed that written procedures represented a barrier within the local context (Uvhagen et al., 2021). However, multiple reported Needs

addressed aspects of involuntary loneliness of elderly, a topic that also emerged during the workshops.

Thus, the team integrated these needs and workshop results into the regional challenge of "*Breaking and preventing involuntary loneliness among the elderly*." Long-term loneliness has been a long-standing challenge in rural Sweden, which substantially worsened during the COVID pandemic, which coincided with the project. The problem was particularly present in the partnering municipalities, whose populations are characterised by high shares of elderly residents [ÖI1, ÖI2]. As approaches to change the situation often struggled to reach these target groups, the Call for Solutions asked for approaches to identify involuntarily lonely elderly people and to improve the availability of "*social contact*" (Raso, 2021). This reflects a new *understanding* of a proactive patient-centred care concept that calls on the healthcare system "*to be more proactive and see the patient as a co-creator*" of services [ÖI2; BEMS-Ö4]. This understanding surfaced on the intersection of municipal care services foregrounding the need for preventive and patient-centred approaches while CSOs stressed the normative frame for involving patients and citizens more closely in the design and development of healthcare services, especially on questions of mental health and social inclusion for the elderly:

> *"We don't go out and ask the patients, the nurses, the doctors or the inhabitants of Örebro: What is your opinion about healthcare? What do you think should change? […] maybe we can't fulfil all their wishes, that's fine, but we should go out there and talk to the people."* [ÖI4]

In the subsequent Call for Solutions, a total of eight Solutions were submitted. The Selection Committee selected a proposal that brought together a consortium of ten organisations, including care providers, and CSOs, like churches, senior organisations, and sports clubs, under the leadership of the Laxå municipality (Anastasi et al., 2023). The Solution "*Seniors leading Seniors"* consisted of two parts: First, an outreach programme that leverages the existing networks of collaborating organisations to identify elderly individuals experiencing involuntary loneliness and extend personalised invitations to social activities. Second, the project aimed to establish an arena, as an accessible gathering spaces for elderly, were activities with a focus on physical activity, social interaction, and physical and mental well-being are offered, "*designed upon their*

inputs and wishes" [ÖI5]. In terms of *activities*, this Solution first, introduced actors that normally are not part of established healthcare practices that deal with mental healthcare and prevention, and second, engaged the elderly in new *activities* to reduce their vulnerability to mental health issues. Through their facilities, e.g., the sports infrastructure as sites of social activities, the CSOs further contributed with their *materialities*. The objective of the solution has been to change the work relations within the practice field to support the transition towards patient-centred services:

> *"The transformation to person-centred and integrated care sets a high demand to work differently, more promotive and preventive, and we think that social innovations are a really important part of this transformation."* [ÖI1]

The co-creation team was composed by Laxå municipality, the local healthcare centre, a retirement home, a total of six CSOs, and the church [BEMS-Ö7]. In total, the co-creation process, comprising a series of workshops, involved 53 participants, including 25 elderly individuals. The process aimed to design activities for the target group and develop new inter-organisational arrangements to support their social inclusion (Anastasi et al., 2023). During the initial stages, the objective was to get a better understanding of the phenomenon by analysing the needs and underlaying *understandings* of the target group as well as the studying existing *activities*, leveraging ongoing collaboration and practices at territorial level [BEMS-Ö8]. Central to the target group was that their *understanding* to not wanting to be a burden to family and society. Further, as they were able to live alone without need of municipal services, they are rather healthy [ÖI1, ÖI2]. The outreach *activities* were organised via the networks of participating organisations, focusing on social networks of younger seniors, as well as through targeted communication channels of the municipality and health centre.

Subsequently, a group of elderly people, identified via the outreach process, was engaged in the co-creation of new *activities*. The analysis of ongoing offers targeting elderly identified the *Seniorkraft* programme, which allowed to combine social and dedicated healthcare activities. The programme finances preventive *activities* and was used to engage a group of 15 seniors in a 15-week long intervention [ÖI5]. It combined preventive health screenings, social and physical activities, and motivational components aimed at maintaining or improving the health of seniors. Thus, the Solution combined various old

and new *activities* in a configuration that aims to increase the health of seniors and combat loneliness. The programme's original setup was improved by the inclusion of the CHERRIES pilot's outreach programme and the embedding in the network of CSOs. Through this organisational change, new actors contributed with their *activities* and *materialities* to improve an existing practice [BEMS-Ö13]. The different process stages of the CHERRIES experiment were critical in identifying and addressing this challenge with an appropriate solution:

> *"We had reflection times during the whole CHERRIES stages, that was very good as it contributed to the co-creation process [...] when you have engaged with all these different stakeholders and perspectives, you really gained a deeper understanding of first the Needs and only than the Solution. This is a really good way of working."* [ÖI2]

Summarising, in Örebro the CHERRIES experiments mobilised an ecosystem of healthcare and CSO actors around a problem on the intersection of the normative frame of inclusion and sectoral objectives of prevention. Under this shared *understanding*, this inter-sectoral group reconfigured the *Seniorkraft* practice by integrating new actors and their *activities* as well as their *materialities*, highlighting the dynamic interplay between continuity and change within a practice configuration. The RRI-based need identification and co-creation process provided the structural context for identifying unmet needs and developing appropriate solutions. Through this process, the involved organisations initiated a process to "*change the way we work*" [ÖI1, ÖI2] and the increasing participation of elderly people in the programme *Seniorkraft* indicates that the approach was successful.

5.4.2. Providing healthcare services in remote Cyprus

In Cyprus, a mediterranean island that has been divided for decades, the project focused on the Greek-Cypriot[1] part of the island. With a population of just under one million, Cyprus is characterised by low population density and a substantial proportion of its citizens living in rural or remote areas. The project took place in a time of major changes

[1]We refer to the Greek-Cypriot[1] part of the island as Cyprus from now on.

in the organisation of the healthcare system [BEMS-C1], which saw the launch of a National Healthcare System (NHS) characterised by the newly established National Health Insurance Fund paying for services provided by a mix of public and private providers (Petrou, 2021). This transition affected the local CHERRIES team, as the Aretaieio Hospital, one of the largest private hospitals, joined the NHS, which tripled the demand of medical services the hospital was facing [CI7]. Together with Aretaieio the Cyprus Research and Innovation Centre (CyRIC), as central actors in the R&D community of the island, formed the local CHERRIES team. Both actors brought complementary strengths: CyRIC offered expertise in innovation and start-up support, while Aretaieio contributed healthcare and sector-specific innovation expertise [BEMS-C2]

Put together, these factors shaped the context for the CHERRIES experiment. The geographical features, with a large segment of the population living in rural areas, in combination with healthcare expenditures significantly below the EU average, create structural limitations that hinder the delivery of timely and equitable medical services across the country [CI6]. The healthcare reform resulted in an ongoing reconfiguration process changing relations between existing structures, practices, and actors. In this situation, the COVID pandemic exposed significant vulnerabilities in the accessibility of healthcare services amplifying existing disparities, such as isolation and difficulties in accessing routine medical care.

The regional Call for Needs was implemented in this context [BEMS-C3]. While the process was perceived as challenging in the given cultural context [CI6], personal contacts with key actors generated interest, and, consistent with the context tailored approach, this personalised strategy proved effective in raising awareness and engaging actors in need identification (Uvhagen et al., 2021). In total eight Needs were reported by patient organisations, healthcare providers and citizens during a two-month period. While these Needs represented diverse issues, a general demand of telemedicine support was identified as a common denominator. Thus, the Selection Committee decided to aggregate the Needs into the challenge *“Provision of medical services to the Cypriot citizens that live in rural and remote areas and do not have easy access to healthcare services and prescribed medicines”* (Raso, 2022). The political situation, along with the COVID crisis, played a significant role in the emergence of this

understanding, as a central Need was the fact that patients living in the occupied North were unable to access healthcare services due to border closures implemented as part of pandemic management. Thus, the context provided a critical juncture for addressing a structural problem, which further aligned with epistemic *understanding* of patient-centred and inclusive care that aims to provide accessible, high-quality healthcare for all citizens [CI7].

> *"For years, patients in rural and remote areas reported problems with the quality of the medical services provided to them. Patients in these communities need to know and feel they are not neglected. They need to feel that they are being taken care of."* [CI7]

In the subsequent Call for Solutions, a total of 12 solution proposals were submitted. The regional Selection Committee selected the Greek company DoctorsHello, whose Solution enables remote access to healthcare through an eco-system of telemedicine tools and a strategic orientation towards cross sectoral collaboration and co-creation (Colonnello et al., 2023). The solution provider came from a similar cultural context and has been working on the design of tele-medicine services, taking its societal and structural contexts into consideration, for about 20 years (Gortzis, 2007). Generally, the eco-system of DoctorsHello is rather mature from a technological point of view and consists of three main *materialities*. First, an electronic medical records system, which can either stand alone or be integrated with other systems, serves as the foundation of the digital ecosystem by providing the patient's history and current data during remote consultations and ongoing care. Second, the teleconsultation subsystem provides an encrypted communication channel for real-time interactions between patients and healthcare professionals. Third, the telemetry subsystem supports capturing clinical parameters, such as electrocardiogram, oxygen saturation, and blood pressure, through medical devices and transmits these data to clinicians in real time [CI8].

The co-creation phase commenced with the formation of a co-creation team that was composed of representatives from CyRIC, Aretaieio, and DoctorsHello [BEMS-C7]. Based on the subsidy contract and co-creation agreement, the roles and responsibilities foresaw that CyRIC assumes the role of facilitator and process manager, Aretaieio took the responsibility of engaging health professionals, defining the technical and ethical

requirements of the telemedicine solution, and arranging the pilot activities with patients in remote areas, while DoctorsHello, adapted its existing telemedicine technology according to captured user requirements. During this initial stage, the team collectively articulated and agreed upon the core *understandings*, the normative principles of inclusivity, responsiveness, and patient-centred care, as guiding concepts for the development of the pilot (Colonnello et al., 2023).

Once the co-creation team was established, the process continued with a series of seven co-creation meetings, involving a total of 63 participants out of whom 37 were patients and 10 healthcare professionals (Anastasi et al., 2023). These meetings served as the primary forum for refining requirements, testing, discussing progress, integrating feedback, and involved a detailed analysis of technical, ethical, legal, and social parameters. This alignment was further amplified by the objective to create a responsible innovation, ensuring that the solution is accessible and adaptable for the target group [BEMS-C9]. Given the ongoing COVID restrictions, most interactions were conducted remotely and partly asynchronous. While this enabled the process to continue within the allocated timeline, it also slowed building up trust among stakeholders due to the reduced opportunities for face-to-face interactions (Colonnello et al., 2023).

The co-creation process included the introduction of new *materialities* and making them work through a set of aligned *activities*, which required actions from different actors. The iterative inputs from patients and healthcare professionals shaped the Solution by providing the basis for improving its functionality and service design. For DoctorsHello, this offered an opportunity to adjust the material configuration of their e-health Solution to the Cypriot context and focused on the optimisation of functionality and practicability:

> *"We have invested a lot in requirement analysis, redesign, validation, and continuous monitoring and reporting to ensure comprehensive data collection, assessment, and analysis. So, we can make it practical, make sure it's feasible, and scale it later."* (CI8)

The Solution prototype was adjusted for the use case in Northern Cyprus with the help of the local communities, which were supported and served by Aretaieio [BEMS-C13]. Thus, the hospital created novel *activities* within their operations to facilitate remote clinical encounters as well as the required organisational adjustments. The telemedical

encounters necessitated imbricated technological and organisational shifts, encompassing the *materiality* of dedicated workstations and telemetry systems together with *activities* such as revised scheduling and training patients to use the new material components. This included establishing telemedicine nodes in the North of the island, that were populated with the telemetry subsystem and mobile nursing recruited from the local community, supporting patients during their consultations. Organisationally, the solution required integrating remote services into the billing system [BMES-C13].

In summary, the CHERRIES experiment in Cyprus mobilised multi-actor collaboration in a complex, resource-constrained environment and resulted in a practice bundle offering telemedicine services to communities with limited access to the healthcare system. The practice builds on a normative *understanding* that emphasises inclusivity, patient-centred care, and equitable access to healthcare, which is rooted in place-specific mobility and resource constraints. The Solution introduces new *materialities* in form of the electronic medical records system, a teleconsultation system, and the telemetry subsystem, which were integrated into running operations of Aretaieio through the development of specific *activities* in the hospital as well as within the served community.

5.5. Discussion

This paper aimed to provide an illustration of how feasibility is achieved in novel healthcare service innovations and to illustrate how RRI practices can systematically support this process. Drawing on the SPT literature, we deployed an understanding of healthcare services as bundles of *activities*, *understandings*, and *materialities* as well as of change as a reconfiguration process that can change these elements and their relations. In this thinking, feasibility of a practice bundle is the alignment-in-use of the practice's elements. We used this conceptual understanding to discuss the changes we observed during the CHERRIES experiments in Örebro and Murcia. The analysis of the empirical cases highlights that feasible healthcare services, as the mutually conditioned interactions of healthcare professionals and patients, emerge from dynamic linking of practice elements, which are not independent but mutually constitutive, as changes in one aspect prompt adjustments in the others.

In the Örebro case, for example, novel *activities* arose as actors outside the traditional boundaries of healthcare assumed intermediating roles in delivering a community-based intervention, increasing its effectiveness. This change was facilitated by an alignment of a new normative *understandings* calling for inclusive approaches with existing epistemic frames of prevention, contributing to "*close care*", a regional care strategy which builds on concepts of integrated and patient-centred approaches. Simultaneously, the *materialities* were adapted by integrating new infrastructures, in the form of meeting spaces, to support these new processes. Likewise, in Cyprus trailing an advanced telemedicine solutions was not solely a technological innovation but necessitated substantial changes in clinical workflows and organisational routines. Integrating new *materialities,* in the form of digital interfaces and monitoring devices, required aligning the *activities* of healthcare professionals and the underpinning *understandings*, which utilised a critical juncture of political context, pandemic, and frames of inclusivity and accessible care. Thus, in both cases the careful construction of new *understandings*, created the foundation for the subsequent changes in other practice elements. The co-creation itself was an alignment process, that reconfigured these *activities*, *understandings*, and *materialities* into a working practice configuration.

Such interdependencies across practice elements demonstrate that the feasibility of healthcare service innovations depends on a reconfiguration of a service's architecture and needs to be understood as emergent phenomenon depending on the self-organisation and systematic interactions of various actors (Greenhalgh & Papoutsi, 2018) that form the practice field's selection environment (Windrum & García-Goñi, 2008). Thus, feasibility of a healthcare service innovation is contingent upon a multifaceted interplay of technological, institutional, and organisational change in complex adaptive systems rather than based on isolated interventions. As such the development of healthcare service innovations depends on the ability of actors to integrate multiple perspectives and place-based conditions in reconfiguration processes (Philipp & Amanatidis, 2025), the capabilities and agency of public organisations to renew existing organisational routines (Kattel, 2022), and on processes that allow reconciling diverging logics and values (Greenhalgh et al., 2018).

The RRI-based CHERRIES experiments provided a process model that can contribute to these demands as it offered a stage-gate negotiation and learning space to facilitate the iterative adjustment of practice elements during the development of a healthcare service innovation. The Call for Needs invited stakeholders to problematise issues affecting service delivery quality, thereby foregrounding topics that may embody divergent logics and values. These Needs, thus, served as a catalyst for institutional change by allowing regional change agents to turn institutional tensions into a source of change by legitimising previously marginal perspectives (Micelotta et al., 2017). In both regions, this process was facilitated by carefully aligning new institutional logics with existing institutional frameworks, highlighting that embedding new cultural and social norms requires a balance between change and reproduction. The subsequent Call for Solutions and co-creation allowed actors to innovate by translating these newly formulated narratives into practice. While the Call for Solutions aimed to select an appropriate and acceptable way forward, the co-creation process facilitated the move from the Solution's general idea, to understanding its practical implications in each context. As such, the co-creation constitutes the creating and testing of feasibility. It highlights the interrelated nature of the proposed practice's *activities*, *understandings*, and *materialities*, as a basis for adopting such an approach. It empowered a group to actively structure change by aligning old and new practice elements into a new bundle, while aiming to make sense of to the structural and agential forces within the practice field.

These core dynamics were central in both cases, even though the different priorities of the regional actors led to the development of a technological and a social innovation. Generally, the CHERRIES experiment design proved to be highly effective in building coalitions around shared problems by enabling their articulation, fuelling institutional change and directly moving towards the development of feasible service innovations. Key for that was putting the Needs of the served publics at the centre by giving service recipients an active voice in shaping the innovation. Further, the collaboration dynamics between actors fostered their commitment to change and allow them to contribute in an appropriate way (Coelho Rodrigues et al., 2024). However, while actors in both regions were intending to implement the co-created Solution into their operations, the model only creates pilots which, statistically speaking, are likely to fail and will require time to be fully implemented into routines of healthcare professionals (Zullig et al., 2024). While the

alignment of practice elements into a feasible practice bundle through the co-creation process provides a basis for implementation, amending the model with another stage, allowing the Solution to mature, create legitimacy and institutionalise within the field that is shaped by a ridged evidence regime, might increase the likelihood for generalisation.

As such, both cases illustrate that establishing feasibility of healthcare service innovations depends on a tripartite change mechanism, during which altered or new technological, institutional, and organisational concepts provide compatible logics for the alignment of *activities*, *understandings*, and *materialities* into workable practice bundles. RRI can facilitate these changes by providing inclusive process methodologies that facilitate a collective reflection on current challenges, potential solutions, as well as a co-creative alignment of these change dimensions.

5.6. Conclusion

This paper addressed the challenge of adopting healthcare innovation as a question of creating feasible healthcare services. It contributes a systemic perspective on healthcare service architectures by conceptualising healthcare services as a social practice and shows how experimental approaches based on RRI theories and practices can support the emergence of alignment-in-use. Drawing on praxeological theories, we conceptualised healthcare services as configurations of *activities*, *understandings*, and *materialities*, and analysed healthcare innovation as a reconfiguration process. Empirically, we applied this understanding on two policy experiments that operationalised RRI principles in regions in Sweden and the Republic of Cyprus. Our findings show that feasibility of healthcare service innovations is an emergent outcome of aligning new and existing practice elements across technological, organisational, and institutional domains. RRI approaches, particularly when structured into participatory stages such as our Call for Needs, Call for Solutions, and co-creation, can facilitate this alignment by legitimising new perspectives, enabling stakeholder engagement, and fostering, reflexive, pluralistic and iterative innovation processes.

The findings of this study contribute to the theoretical understanding of feasibility in healthcare service innovation. By conceptualising innovation as the reconfiguration of interconnected elements, we move beyond dominant models that treat healthcare

innovation primarily as technological or organisational adoption. We illustrate that feasibility emerges within situated practices that are shaped by institutional logics, professional routines, and material affordances, where changes in one element necessitate adjustments in the others. Such a perspective allows for the investigation of the de- and re-alignment of elements within practice bundles, the structural and agential forces shaping innovation trajectories, and the group dynamics within communities of practice, which implicitly coordinate and sustain these changes. This perspective further entails that stability and change are not contrasting but co-constitutive dynamics within practices.

From a practical and policy perspective, the study yields several insights for innovation management and the application of RRI in healthcare. The experiments demonstrate how RRI principles can be operationalised to structure innovation processes to build feasibility, align diverse actor perspectives, and anchor solutions in a field. Our three-stage model created a negotiation space that enabled stakeholders to identify and articulate problems, co-develop context-sensitive solutions, and align them with existing institutional and organisational realities. However, the model also has limitations. Most notably, the process concludes with the development of pilot solutions, which, while aligned with its practical context, remain vulnerable to discontinuation, reflecting the broader challenge in innovation management to bridge the gap between prototyping and sustained implementation. To enhance its utility, the experiments design could benefit from an additional stage focused on maturing and generating the evidence base that legitimises a broader uptake. As such, responsible innovation processes should consider not only the design of participatory processes but also the organisational and institutional support and uptake processes necessary to ensure that these innovations move from experimentation to reconfiguration.

With this contribution to the development of a responsible understanding of healthcare service innovation, the study also has several limitations that should be acknowledged. The findings are based on a qualitative, interpretive approach and draw on two regional cases within a specific policy experiment framework. While this enables rich, context-sensitive insights into the dynamics of practice reconfiguration and the role of RRI, it constraints the generalisability of the results. Additionally, while the study sheds light on

the initiation of healthcare service innovations, it provides limited insight into how such changes are sustained or scaled over time. To further advance research on responsible and sustainable healthcare service innovations (Broerse & Grin, 2017; Lehoux et al., 2022), future research must further investigate how technological, organisational, and institutional concepts pattern the emergence of feasible practice configurations, what dynamic capabilities of public organisations are needed to integrate them as a way of renewing their operational routines (Kattel, 2022), and the characteristics and contexts of such change agency (Philipp & Amanatidis, 2025). Further, a conversation between practice theories and sustainability transition research should focus on linking changes in the things people do with broader dynamics of system change.

6. Bits or Bricks? A configurational perspective on healthcare service transformation

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Abstract

While changes in NCD care are necessary for sustainable service delivery, evidence-based healthcare innovations are rarely adopted and diffuse slowly. To design innovation processes that support the legitimation and, subsequently, an accelerated uptake of service innovations, there is a need to better understand their generalisation dynamics. Thus, this paper examines how service innovations transform healthcare systems by analysing two contrasting cases of diabetes care. Using a configurational framework grounded in practice theory and socio-technical transition theory, it highlights how technological, organisational, and institutional concepts interact to shape new practice configurations. The findings show that transformation depends on the alignment of these elements and unfolds through distinct processes of implementation and reconfiguration. By comparing a technological and an organisational innovation, the study advances understanding of generalisation as a relational, systemic process and offers insights for policy, practice, and theory on sustainable healthcare transformation.

6.1. Introduction

The four major non-communicable diseases (NCD), namely cardiovascular disease, cancer, chronic respiratory disease, and diabetes, are expected to account for over 90% of all deaths in regions like the Americas, Western Pacific, and Europe by 2048 (WHO, 2023). This epidemiological transition (Omran, 1971), which is characterised by a shift from high child mortality and threats of infectious diseases to a higher prevalence of chronic conditions, threatens the healthcare sector's sustainability as it fails to manage these illnesses on a systemic level (Broerse & Grin, 2017; Tan et al., 2021). In this sense, NCDs disrupt the curative imperatives that structure current healthcare services (Green & Lynch, 2022). Addressing NCDs and their impact on healthcare systems requires the adoption of new practices that enhance patient experience, population health, reduce costs, and promote the well-being of healthcare teams (Bodenheimer & Sinsky, 2014).

These approaches necessitate an active role of patients in the co-production of healthcare services (McColl-Kennedy et al., 2017) and, as such, go beyond single innovations, as they entail a reconfiguration of service delivery at organisational and institutional levels (Barlow, 2016; May, 2013a; A. D. Meyer et al., 1993).

In this context, the study of healthcare innovation processes is unlike that of other sectors (Barlow, 2016) and while the implementation and diffusion of healthcare innovations has been studied with different theorical perspectives (Shaw et al., 2017), studies from an innovation systems (Consoli & Mina, 2009; Marjanovic et al., 2020; Windrum & García-Goñi, 2008), a socio-technical transition (Broerse & Grin, 2017; Bugge et al., 2018; Johansen et al., 2018), or a generalisation perspective (Coelho Rodrigues et al., 2024) remain scarce. Hence, the literature on healthcare innovation is fragmented, disease specific, and often characterised by a linear, process-orientation on adoption while there is a need of studies that illuminate the system-level implications of innovations, especially if they require changing roles and interaction of patients and healthcare professionals (Broerse & Grin, 2017; Coelho Rodrigues et al., 2024; Greenhalgh & Papoutsi, 2018; Marjanovic et al., 2020).

To study transformative change, research on the intersection of socio-technical transitions and Social Practice Theories (SPT) gained importance over the last years (Geels et al., 2015; Laakso et al., 2021; Sovacool & Hess, 2017b; Svennevik, 2022) and seems to be a promising perspective for healthcare service innovation as it combines a perspectives on what people do with theories of system change. Consequently, this contribution builds on a transformation framework for healthcare practices, drawing on neo-institutional accounts of socio-technical transitions (Fünfschilling & Truffer, 2014; Heiberg et al., 2022) and on practice-theoretical approaches that attend to broader configurations or complexes of practices (Svennevik, 2022; Watson, 2012). Following this understanding, practices are interpreted as configurations of technological, organisational, and institutional concepts that shape learning, scaling, and embedding efforts within the service regime (Coelho Rodrigues et al., 2024; Sengers et al., 2021; van Welie et al., 2018).

In this context, emergence, implementation, and reconfiguration represent gradual steps of a generalisation process within and between the concepts that comprise and afford a

practice configuration (Heiberg et al., 2022). This framework is mobilised to answer the research question: *How does the generalisation service innovations for NCDs transform healthcare systems?* The paper discusses this question in the context of two cases for diabetes care. The ProEmpower project that tailored a digital solution for supporting self-management and remote monitoring to the specifications of four healthcare systems. The second case, the diabetes centre Wienerberg, is the first specialised centre of this kind and adds a new organisational concept within the Austrian public healthcare system. These cases illustrate the interrelated reconfiguration of institutional, organisational, and technological changes during the generalisation process of healthcare service innovation. These cases highlight how emerging concepts are reshaping diabetes care by redistributing tasks, leveraging technology, and fostering interdisciplinary collaboration.

The remainer of the paper is organised as follows: First, the theory section introduces a configurational perspective on transitions in practice and further discusses the main concepts of healthcare service regimes. Second, generalisation and related concepts, are introduced. The third section discusses the case selection rationale and introduces the methodology. The fourth section presents the analysis of the two cases, which is followed by the fifth section that discusses the implications for theory and practice of these two cases. The closing section on provides conclusions, including limitations and further research needs.

6.2. Theoretical background – practice change in healthcare

6.2.1. A configurational perspective on practice change

While praxeological approaches to transformative change play an important role (Sovacool & Hess, 2017a; Svennevik, 2022), the literature on socio-technical transitions firmly rests on the ontology of the Multi-Level Perspective (Geels, 2024), technological innovation systems (Hekkert et al., 2007), and niche management (Loorbach, 2010). Combinations of these theories are emerging (van Uden et al., 2024), however, they rarely build on the neo-institutional conceptualisation of transitions (Fünfschilling & Truffer, 2014), which provides a suitable angle to effectively combine theoretical concepts from practice and socio-technical transition theory. Following Fünfschilling and Truffer (2014), socio-technical systems contain a range of material and cultural structures that are

institutionalised to various degrees, with the regime being the most highly institutionalised core. Transitions, thus, are ongoing structuration processes of de- and realigning of technologies with specific informal and formal field logics (Thornton & Ocasio, 1999). Subsequently, a socio-technical system, as a special case of an organisational field, holds a variety of more or less aligned configurations of technological and institutional concepts (Heiberg et al., 2022).

In contrast, SPT emphasises the importance of everyday practices and routinised behaviours as the fundamental units to understand social change. Following Schatzki (2019), practices are open spatio-temporal arrays of doings and sayings, governed by a largely normative set of shared understandings. These practices are entangled with material arrangements in evolving practice–arrangement bundles that constitute organised activity within dynamic configurations. These bundles are situated and do not float free of technological and institutional contexts (Randles & Warde, 2006). The potential of changing practices lies in replacing or altering their elements or their linkages (Laakso et al., 2021; Shove et al., 2012), incl. their normative understandings which can be interpreted as institutional orders and logics (Schatzki, 2021). By understanding a regime as a complex constellation of practice-arrangement bundles (Hölsgens et al., 2018; Schatzki, 2019; Svennevik, 2022), a system is constituted and sustained by the continued performance of the practices which comprise it.

The institutional perspective on socio-technical regimes allows to overcome the conflicting ontologies of change in transition studies and SPT (Geels, 2011; Schatzki, 2011) by conceptualising change as the unfolding of events and chains of human activity (Schatzki, 2019) within complex, horizontally interconnected practice bundles and their configuration of material and social concepts (Fünfschilling & Truffer, 2014; Heiberg et al., 2022) rather than hierarchical dynamics between niche, regime, and landscape. This convergence of the two approaches gives rise to a configurational understanding of change (Geels et al., 2015; Meyer et al., 1993). Geels (2018) refers to gradual reconfiguration of socio-technical systems as a process in which system elements are incrementally improved, replaced, or changed in terms of relational architectures. In a similar vein, a practice reconfiguration describes the dynamic process through which parts or elements of practices are reorganised, replaced, or rearranged and it thus affects

the organisation of a practice or the relations between practices (Laakso et al., 2021; Shove et al., 2012).

Subsequently, a reconfiguration process of practice refers to a gradual, dynamic institutionalisation process in which existing elements within systems or practices are incrementally altered, replaced, or reorganised. In the absence of a dominant design or architecture, emerging practices combine old and new technological and social concepts to meet specific local contingencies and user requirements (Fleck, 1993a; Henderson & Clark, 1990). Due to this customisation, emerging configurations have a weak identity, systematicity, and system dynamics (Fleck, 1993a), which negatively affects generalisation processes.

6.2.2. Elements and directions of healthcare service regimes

Following Røpke (2009), the activities of patients and healthcare professional(s) are mutually conditioned and any healthcare service cannot be delivered without the participation of both parties, thus, the interdependent relations of patients and healthcare professionals form one single practice. Consequently, healthcare practices are co-produced preventive, diagnostic, therapeutic, or rehabilitative services that are bundled with materials like diagnostic tools, drugs, or medical devices (Barlow, 2016; Greenhalgh et al., 2017). However, in line with the traditional organisational healthcare model, it is the healthcare professional's expert knowledge, along with the required medical tests and treatments that primarily shapes the practice, with an emphasis on the medical problem rather than the person (Broerse & Grin, 2017; McColl-Kennedy et al., 2017). This passive role of the patient and the increasing specialisation and fragmentation of services are considered limiting factors in the further development of healthcare (Broerse & Grin, 2017) and attempts to redefine the roles of patients have taken place through the introduction of different practice approaches (McColl-Kennedy et al., 2017).

The search for new practice configurations, thus, revolves around the roles of patients and the organising frameworks that define roles, activities, and associated interactions within the healthcare system. Among the approaches that reconfigure existing practices for NCD care are person-centred care (Scholl et al., 2014), patient empowerment (Gibson, 1991), self-management (Grady & Gough, 2014), and value co-creation (Hardyman et al., 2015). To different degrees, these concepts aim at empowering patients

to take control, become an expert on their condition, and actively self-manage it by becoming co-creators in the practice (McColl-Kennedy et al., 2017). The role of the healthcare professionals, subsequently, requires taking a whole person perspective, increase their healthcare literacy, while facilitating the patient's self-management and remaining the expert on care. These changes in activities and roles require new organisational concepts, putting the patient needs at the centre rather than optimising clinical workflow.

Healthcare practices are produced, reproduced, and transformed within formal institutional and organisational regime structures (May, 2013a), which recursively shape and are shaped by the actions and interactions of involved actors. Organisational resource allocations and institutional frameworks structure the encounters between healthcare professionals and patients, who, through their ongoing practices, contribute either to the reproduction or the potential transformation of the service (Bodolica et al., 2016; Smets et al., 2017). The implementation of new institutional concepts like patient-centred and empowering approaches, thus, needs to be made workable through the respective organisational concepts. Building on a combined theoretical understanding as outlined above, healthcare services can be conceptualised as complex configurations of practice arrangement bundles (Schatzki, 2019), whose architecture is defined by the concepts it rests upon. The development of a new practice architecture will require a reconfiguration of its technological, organisational, and institutional concepts.

6.3. Generalisation of novel innovative healthcare service configurations

The recognition that established diffusion theories fall short in explaining systemic change (Sengers et al., 2021), initiated a process of reimagining the concept under the term generalisation, which encompasses the different routes and processes that shape, normalise, and embed the outcomes of innovation with a transformative perspective (Robinson et al., 2024). This thinking acknowledges that generalisation processes of innovations going beyond incremental changes, typically features structural, technical, and capacity misalignments (Coelho Rodrigues et al., 2024) and, thus, requires an alignment of old and new elements into a novel configuration. During this alignment

process that aims at integrating an innovation into routine operations, both, the adopter and the innovation, are subject of change (Leonard-Barton, 1988).

In the context of emerging healthcare service innovations, generalisation is mostly discussed as implementation (Coelho Rodrigues et al., 2024; Greenhalgh et al., 2017; May, 2013a), which describes the uptake of evidence-based innovations into routine practice to improve the quality and effectiveness of healthcare services (Eccles & Mittman, 2006). Implementation, especially of non-pharmaceutical innovations (Robert et al., 2010), involves highly organised, institutionally sanctioned, and systematically regulated changes in the organisational and institutional structure of the healthcare service regime (May, 2013a). This results in a situation where there is not a single adoption decision, but adoption and generalisation unfold over time. In this process, the linkages and compatibility between the inner context, meaning organisational aspects, and outer context, meaning system-level aspects, of an innovation are as important as the specifications of the innovation itself (Moullin et al., 2019) and, thus, innovations are further adjusted locally during adoption processes for a better contextual alignment (Barlow, 2016; Coelho Rodrigues et al., 2024; Rabadjieva & Zirngiebl, 2023).

Generalisation is, thus, depending on a gradual reconfiguration of technological, organisational, and institutional practice concepts and their linkages into a novel relational architecture. Given that regimes and practices are inherently pluralistic and dynamic (Denis et al., 2007), multiple concepts exist at the same time and the innovation process is a competition of various old and new concepts, their alignment in working configurations, and the (de-)institutionalisation of concepts (Thornton & Ocasio, 1999), which goes beyond implementation and includes discontinuing certain concepts (Turnheim, 2022). Thus, a specific set of concepts are mobilised to pattern service processes like screening, anamneses, testing, diagnosis, treatment, and monitoring. These concepts are understood as:

- Technological concepts are understood as the material application of knowledge, offering specific functions, components, or operating principles to fulfil social purposes in a specifiable and reproducible manner (Fleck, 1993a; Leonard-Barton, 1988; Skolnikoff, 1993). These concepts provide both material inputs and distinct forms of agency to practices and are enacted through the work of

healthcare professionals or integrated into patients' daily lives (Orlikowski & Scott, 2008). Technological concepts may be generic, e.g., computers or smartphones, or specific to healthcare, e.g., technique, medical devices, or pharmaceuticals (Røpke, 2009).

- Organisational concepts define the purposes and interrelations of system elements in terms of processes and relational structure. Organisations provide resources, physical and digital infrastructures, social structures, legitimacy, and meaning (van Raak & de Haan, 2017) all of which shape and support human activity through a division of labour (Schatzki, 2019; Smets et al., 2017). In healthcare, this manifests in differentiated levels of disciplinary specialisation that organise patient pathways and clinical workflows (Broerse & Grin, 2017).
- Institutional concepts are the hard and soft contexts (Scott, 1995; Tolbert & Zucker, 1999) that shape the behaviours of actors, the use of technologies, and the structuring of organisations within a field. Institutional concepts such as practice approaches (McColl-Kennedy et al., 2017), provide socially constructed, historically developed rules, assumptions, values, and beliefs (Thornton & Ocasio, 1999) that influence what is included in reimbursement plans, clinical guidelines, and regulatory approvals. These logics are deeply institutionalised and embodied in organisations and workforce (DiMaggio & Powell, 1983; Zucker & Schilke, 2019).

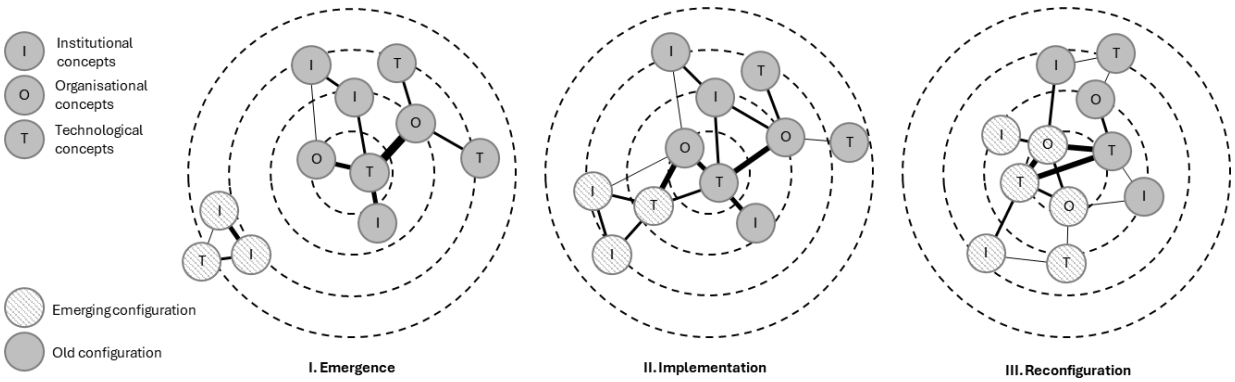

Figure 8: Generalisation process as alignment of technological, organisational, and institutional concepts. Based on Heiberg et al., 2022

By expanding the approach from Heiberg et al. (2022), Figure 8 illustrates practice transformation as shifting alignments of the socio-technical concepts comprising a practice configuration within an organisational field with three levels of institutionalisation, labelled as a) emergence, b) implementation, and c) reconfiguration.

The old configuration is depicted as a distinct slice of a practice constellation consisting of various concepts and is deliberately delimited from emerging concepts, which, however, are part of the same field and are entangled through other bundles. Institutionalisation is illustrated as the emergence of a new practice configuration on the regime's periphery, which gains legitimacy through implementation processes and thereby migrates towards the regime's centre. Ultimately, incumbent concepts are phased out as new ones stabilise, leading to a reconfiguration of the service regime. In this understanding, reconfiguration changes a system's architecture and goes beyond implementation of novelty by recognising that transformation entails the decline, discontinuation, and phase-out of old concepts (Turnheim, 2022).

6.4. Methodology and case rationale

6.4.1. Case rationale

The question of how service innovation becomes generalised within and transforms a healthcare system is examined in the context of diabetes mellitus, a NCD that due to its prevalence and impact on healthcare systems and patients' lives has been described as pandemic (Unwin, 2011). Diabetes is a group of metabolic disorders of carbohydrate metabolism in which glucose is both underutilised as an energy source and overproduced due to inappropriate gluconeogenesis and glycogenolysis, resulting in hyperglycemia (ADA, 2023). If left untreated over the long term, hyperglycemia can cause damage to many of the body's organs, leading to disabling and life-threatening health complications such as cardiovascular diseases, nerve damage, kidney damage, lower-limb amputation, and a loss of vision or blindness. Diabetes affects 588 million people worldwide, a number that is estimated to increase up to 852 million people by 2050 (IDF, 2025), thus it is one of the fastest growing health challenges of our time.

The causes of diabetes are not completely understood, however, there is a strong link with overweight and obesity, increasing age, as well as with ethnicity and family history. Thus, life-style plays an important role in developing and managing the condition (Zheng et al., 2017) and consequently individuals do have considerable influence on the course of their disease. Obtaining a healthy weight and physical exercise alone are already associated with a sharp improvement of glycaemic control, blood pressure and cholesterol levels,

reducing the risk of diabetes-related complications (IDF, 2025). Thus, concepts like empowerment and self-management of diabetes have received increasing emphasis, demarking a move away from didactic models of care towards interdisciplinary approaches (Chrvala et al., 2016; Hunt, 2015). These approaches, when combined with robust self-management education programmes, can lead to improved health outcomes. However, these novel approaches vary in their objectives, delivery methods, content, and use of technology, and person-centred philosophy (Chatterjee et al., 2018), indicating the configurational nature and absence of a generalised service architecture.

This combination of high impact on the healthcare system and the life-style-based self-management dimension, makes diabetes a well-suited case for studying service transformation and the generalisation of innovative concepts in healthcare. The selected cases both build on emerging institutional concepts, like empowerment, self-management, and increasing patients' healthcare literacy, but respond by suggesting either a technological or organisational concept to implement novel practices. The first one, ProEmpower, represents an emerging digital healthcare solution while the second one, the Diabeteszentrum Wienerberg, is a specialised outpatient clinic.

6.4.2. Methodology

The study builds on a comparative qualitative case study research design aiming to contrast the development trajectories between these two cases. Grounded in social constructivist theory (Starke, 2005), this design facilitates the investigation of contextualised meanings and processes, emphasising the interplay between individual and organisational dynamics and, thus, offers a robust framework for exploring complex phenomena such as care approaches. By comparing two cases, the study draws on the strengths of comparative methodologies, which enable the identification of patterns, causal mechanisms, and divergent pathways (George & Bennett, 2005). To avoid pitfalls of the methodology, such as the risk of lack of scientific generalisability or underemphasis on unique contextual factors (Flyvbjerg, 2006; Yin, 2003), we employ a robust theoretical framework based on socio-technical transition (Fünfschilling & Truffer, 2014; Heiberg et al., 2022) and practice (Schatzki, 2019; Shove et al., 2012) to link the dynamics transformation processes and their interactions with their respective context

(Moullin et al., 2019). Overall, the study design offers an approach that balances the conceptualisation of generalisation processes with analytical depth and rigor.

The data collection built on qualitative interviews and secondary data for both cases, which was contextualised by the scientific state of the art in diabetes management. The cases were analysed following an adjusted innovation biography approach (Butzin et al., 2024; Philipp & Amanatidis, 2025), tracing their development from idea to involved actors and networks, implementation, and impact. First, based on the project documentation and underlying strategies, first case descriptions and key interview partners were derived. Second, qualitative interviews were conducted to uncover the actors' understanding and imaginaries of a future working world that are inscribed in the projects. Following a snowballing approach, a total of ten semi-structured interviews with twelve interviewees were conducted. The interviews generally lasted between 60-90 minutes and were recorded for later verbatim transcription. The list of interviewees and the questionnaire can be found in the supplement data. In the finalisation of the case descriptions, project documentation and underlying strategies were used to contextualise and verify the interview data. For each project three relevant secondary sources were identified. These include project deliverables (3), scientific publications (2), and policy documents (1).

The data analysis followed a deductive coding approach, guided by the generalisation framework outlined in the preceding chapter. Using MaxQDA, the interview and secondary data were coded following a deductive approach according to the elements of the generalisation framework. These elements encompassed the i) institutional, ii) organisational, and iii) technological concepts, as well as the levels of institutionalisation, characterised as a) emergence, b) implementation, and c) reconfiguration. This structured coding framework facilitated a systematic analysis, allowing for the identification of patterns and thematic variations across the different data sources while maintaining alignment with the established research framework.

6.5. Reconfiguring diabetes care – the two case studies

6.5.1. The ProEmpower project

The ProEmpower Project, an H2020 pre-commercial procurement project, built on the assumption that an active management of diabetes care needs personalised decision

support tools that summarise patient's clinical characteristics, treatment preference and ancillary data at the point of care (Fernandes et al., 2019; Prodan et al., 2020). In this context, the project, sought to introduce an ICT-based *technological concept* "*to improve communication between patients and healthcare professionals and enable patients to manage their condition at home*" [I1]. This person-centred and empowering approach was trailed across four regional pilot sites in Italy, Portugal, Turkey, and Spain (Fernandes et al., 2019). Fully rolled out in these countries, such an approach would change diabetes care for up to twelve million patients. It reacted to the challenge that service delivery is becoming unsustainable due to demographic change and the increasing burden of chronic illness [I1, I2]. This pressure necessitates innovative approaches to healthcare practice and opens doors for new *institutional concepts* like person-centred care, patient empowerment, and self-management that shaped ProEmpower's pre-commercial procurement approach (Fernandes et al., 2019) and, subsequently, the developed solutions.

The project funded two pilots that provided very similar functionality, as the tender specifications were highly specific, only differing on the way system components were integrated [I1]. These pilots were novel *technological concepts* for telemedicine and mHealth management system that emerged through the different stages of the project. They leverage both proprietary software and commercial hardware elements to help patients manage their diabetes and to enable remote monitoring, thereby supporting them to prevent long-term complications. It builds on the conviction that "*the patient is the protagonist of his own life, of his own illness"* [I2]. Supporting the patient, the system is organised around interdisciplinary care teams, including general practitioners, nurses, nutritionists, and endocrinologists, and enables collaboration through the technological platform. The focus is on monitoring patient's clinical parameters and adherence to treatment plans. It enables patients to record and track health parameters, manage their condition, and integrate data from external devices, e.g., glucometer, blood pressure devices, scales, or wearables. For healthcare professionals, the tool allows for continuous remote monitoring and interaction with patients, fostering a shift from episodic to continuous care [I1, I3].

A core *institutional concept* of the project is its emphasis on patient empowerment. By placing the patient at the centre of the healthcare practice, the tool pushes patients to take a more active role and increases their responsibility for managing their condition. The system builds on increasing patients healthcare literacy and uses a gamification approach to maintain a high level of engagement. Healthcare professionals involved in the project reported significant improvements in patient motivation and autonomy. One nurse highlighted the success of the approach by noting:

> *"For the patients it was a tremendous motivation to manage their disease. Yes, the fact that they could record all their health data themselves and have a means of being in communication with their doctor or nurse if they needed to - it helped them a lot to improve." [I2]*

Another healthcare professional observed "*a multiplying effect on self-care, autonomy and responsibility"* [I5] demonstrating the positive impact of the technological concept on the practice approach and patients. Observed outcomes, including weight loss and reductions in blood glucose levels, document that the approach's merits (De Luca et al., 2023; Prodan et al., 2020).

Despite these promising results, the project also revealed challenges, particularly concerning health and technological literacy of patients. To address these challenges, the development and testing integrated the *organisational concepts* of a dedicated nurse, who trained patients and supported other healthcare professionals. While the platform itself included educational approaches aiming to increase patient's health knowledge, the training on the use of the system and its technological components was critical as many diabetes patients are elderly and struggled with the technological demands of the concept [I1]. Thus, the role of the nurse was crucial in supporting patients to use the technology, to interpret their health data, and solving any problems that might arise in their daily lives. This educational and supportive role is vital in ensuring that patients can effectively engage with the technology and manage their condition.

As such, the novel *technological concept* of ProEmpower changes the healthcare practice as the roles, actions, and interactions of healthcare professionals and patients. Moreover, the interdisciplinary approach promoted by ProEmpower fosters greater collaboration among healthcare providers, allowing for more integrated and coordinated

organisational concepts. As the pilot was designed for developing and testing a technological concept responding to emerging changes in the institutional field, the development of a working *organisational concept* was subordinated. However, the pilots illustrated that the reconfiguration of diabetes care will depend on overcoming organisational inertia and on developing *organisational concepts* as "*the technology is what you are going to use but you are not able to change anything without prior changes within the organisation*" [I6]. Different options for this are possible from minor changes aiming at improving the care practice to major shifts, introducing new roles:

> *"If we aim to proactively manage the disease by contacting patients when their data shows they are deviating significantly from treatment goals, we need dedicated personnel to monitor this data. That person might not be a clinician, it could be a nurse, or even a new kind of professional with hybrid skills in informatics and nursing" [I1].*

As such, the ProEmpower solution is part of an emerging configuration for NCD care, building on *institutional concepts* of patient-centred, empowering, and self-management, which signify a cultural shift in healthcare, deinstitutionalising traditional medical models. The institutional tensions around this change and the high requirements of evidence-based medicine, however, pose barriers. Thus, an implementation requires the creation of an evidence base, highlighting the clinical (De Luca et al., 2023) and economic benefits of such practice configurations. However, even if the evidence is produced, successfully implementing novel technological concepts into organisational structures is facing barriers arising from healthcare literacy and digital literacy of patients and healthcare professionals [I1, I2]. Healthcare professionals act as gatekeepers and "*something that is not comfortable for a health professional is not going to be carried out*" [I2] and subsequently, it is essential to design care models that align with competences and preferences of patients and healthcare professionals. Such a model needs to define roles and workflows but also address questions of financing and reimbursement schemes to cover for software and medical devices that patients use for collecting healthcare data, self-management and monitoring [I1, I7]. These changes require complex changes going beyond single organisations and "*for that I see that there is a lack of competences"* [I7] within the regional healthcare systems.

The ProEmpower project and its pilots have demonstrated the potential of emerging *technological concepts* for the transformation of diabetes care. By promoting patient empowerment, facilitating remote monitoring, and fostering interdisciplinarity the project operationalised new *institutional concepts* through technological development within a new configuration that during a limited pilot proved to be innovative and effective. However, the project has also highlighted the challenges associated with technological literacy and the need for organisational changes to ensure the successful integration of such systems into routine care. The development of a working *organisational concept*, as prerequisite for an implementation is acknowledged [I1, I3, I6] but was beyond the project's scope. However, single technological components have been successfully integrated into operations in a regional outpatient clinic, serving as a Living Lab for trailing new approaches [I1]. In another region, a tender to allow maturing of the configuration was foreseen [I3, I8] but eventually never published due to the challenges faced during the COVID period.

6.5.2. Diabetes Centre Wienerberg

The Diabetes Centre Wienerberg, inaugurated in March 2023, is the first specialised centre of this kind within the Viennese public healthcare system. The centre is part of and implemented in the context of the Viennese healthcare reform of 2013 and its updated implementation plan of 2019 (MA24, 2019). It is realised through a cooperation of the City of Vienna, a public insurance provider (ÖGK), and the Vienna Health Association (WGV), which is one of the biggest public healthcare providers in Europe with around 30,000 employees [I9, I10]. Its initial objective was to establish an innovative diabetes centre to replace current hospital outpatient clinics, improving care quality in alignment with international standards, and optimising extramural treatment quality. Subsequently, the centre should contribute to efficient resource allocation and enhance diabetes therapy by preventing underuse, overuse, and misuse of healthcare services across intra- and extramural settings (MA24, 2019; Rojatz et al., 2024). These objectives have been operationalised through a patient engagement process, that ensured the centre's acceptance and that services are relevant and tailored to the needs of the targeted population [I10, I11].

While the centre is jointly financed by ÖGK and the City of Vienna, with federal co-financing, it is organised as a dislocated outpatient clinic of an established WGV hospital, which provides access to medical staff of a bigger organisation. The centre provides care for 6,000 to 8,000 individuals with diabetes mellitus each year [I12]. It responds to the high demand for diabetes care [I9. I10], as in Vienna more than 100,000 people suffer from diabetes (MA24, 2019), and the quality issues in current practices, which materialise in above average diabetes-related hospital admissions and amputations (Rojatz et al., 2021). Organisationally, it links primary and secondary, incl. acute inpatient, care. Primary care provider transfer patients to the centre, which closely collaborates with specialised centres, e.g., endocrinology and gynaecology at neighbouring WGV hospitals [I10, I12].

The centre employs a multidisciplinary team, including endocrinologists, nurses with specialised diabetes training, dietitians, a psychologist, and administrative staff [I12]. This team provides medical care exclusively on diabetes management, offering extensive educational programmes for patients, ensuring high-quality care with modern, guideline-based therapeutic approaches [I9, I12]. Continuous care is provided for individuals with type 1 diabetes and for women with gestational diabetes while patients with type 2 diabetes are treated at the centre based on referral, typically when treatment goals established by primary care providers are not met or when complications arise. These patients receive specialised diabetes care until the acute issues are resolved, after which routine management is resumed by their general practitioners [I9, I12]. As the centre serves a district with high share of migrant population, the staff is multi-lingual and supported by translators:

> *"Multilingualism is always a relevant issue in the healthcare system, and through such collaborations, we create an optimal point of contact for patients, where they can receive nursing, medical, dietary, and psychological counselling all in one place." [I9]*

Building on *institutional concepts* of patient-centred care, empowerment, and self-management [I9, I11, I12], the central aim is to support a shift from intramural to extramural service models, accompanied by a reallocation of tasks from highly trained medical specialists to nurses and administrative support staff, whose roles are correspondingly upgraded. The *organisational concept* within the centre entails that

patients' first contact is with the administrative staff [I9, I10, I12], who prepare the file through downloading data from patients' devices, electronic patient records, filling of surveys, etc. With this preliminary information, patients first meet with the nursing staff, where a thorough anamnesis is conducted, addressing any issues the patients might have. Only after all the information is gathered, the doctor is involved, which gives them more time needed for therapy planning and implementation [I9, I12]. Thus, the "*six-eyes*" [I12] approach aims to "*strengthen auxiliary professions.*" [I9], to personalise the services by allocating more time to each patient while easing the burden on medical resources.

> *"I believe this approach benefits both the involved staff and the patients. The staff feel valued when they are the first point of contact, as they possess the necessary expertise and additional training. Moreover, I think it improves patient engagement, as the staff take the time to listen. Patients are not treated as just a number but can discuss what is going well, what is not, and where they need support." [I10]*

This facilitates quality-assured, guideline-based treatment and regular screenings for secondary complications, while recognising that not all patient issues are diabetes-related [I12]. The centre trails such an approach, as *"in a hospital structure, such experiments cannot be conducted*" [I9]. Hence, it provides room for experimenting with novel approaches to diabetes care practice [I9, I10], which creates a positive motivation as the staff wants the "*experiment to succeed*" and, thus, "*must actively ensure that patients seek our service and feel supported*" [I12].

Besides the above-described organisational model, the centre integrates new *technological concepts* such as terminals for transferring data from diabetes apps or retina scanners, for the monitoring of eye health into the service offer [I10]. Through the patient engagement process (Rojatz et al., 2024), other aspects like accessibility, a welcoming environment with extended hours and thoughtful amenities, like e.g., childcare, have been integrated as well [I10, I12]. Beyond medical training, nutrition and exercise counselling are tailored for type 1, type 2, and gestational diabetes. The approach includes free cooking courses and a publicly available collection of recipes to optimise diets, which helps patients to better cope with the disease in everyday life and to achieve the agreed treatment goals while maintain a good quality of life.

Generally, staff and patients agree that the concept provides benefits for workforce and patients alike [I12]. Thus, while an evaluation of the clinical effectiveness of the centre is expected for the next years [I9, I10], the approach gains traction within the system. During the implementation process, the project team realised that the idea that the centre could replace hospital outpatient clinics was underestimating the demand for these specialised services [I9]. Subsequently, in fall 2024 the healthcare reform steering committee has decided to implement two more diabetes centres, following the *organisational concept* of the Wienerberg case. Thus, the implementation of the approach is progressing. But, while the initial pilot is being scaled out, it remains on the level of a pilot, financed through special healthcare reform budgets.

To achieve a reconfiguration of the current diabetes care approach, a sustainable concept for long-term financing for these new centres must be found. The Centre's financing has been secured until 2026 but generally, it is "*challenging to transition such initiatives into standard financing models*" [I9]. New payment models and responsibilities must be defined before integrating them into the performance-based hospital financing system, which is a responsibility of the federal ministry and can take years [I9, I10]. From the perspective of the insurance, the integration of such approaches is in the end a political question:

> *"This is ultimately a political decision, as actions have always to adhere strictly to the legal framework. In our case, everything we can and cannot do is outlined in the General Social Insurance Act (ASVG). Essentially, what is needed is a degree of flexibility within the ASVG to accommodate new organisational models that are proven to be effective. However, it is not just the ASVG that requires adjustment; all relevant laws must align and work in unison to facilitate such changes." [I10].*

A reconfiguration would entail a new standard financing model, based on the adaptation of the legal framework, and the expansion of these novel services as a basis for phasing-out expensive hospital outpatient clinics. Without these changes, the centres remain provisionally implemented as long-term projects. As experimental spaces, they support the development and institutionalisation of novel *organisational* and *institutional concepts* like patient engagement, patient-centred and empowering service facilitated

through service shifts in the workforce or the experimentation with *novel technological concepts*.

6.6. Discussion

The paper aims to contribute to our understanding of how healthcare service innovation becomes generalised in practice and how it further transforms its contexts. Drawing on praxeological and socio-technical studies, this contribution conceptualises practice change as the evolutionary dynamics between technological, organisational, and institutional concepts that pattern the implementation of services. These concepts collectively form the architecture of a practice configuration and determine how new approaches emerge, become embedded on practice, and eventually reshape the service regime. This reconfigurational approach to generalisation emphasises the gradual, non-linear realignment of practice elements that shape innovations within their systemic context (Robinson et al., 2024). The comparative analysis of the two cases demonstrates that generalisation is not the result of individual innovations alone but is dependent on the co-evolution and alignment of technological artefacts, organisational routines, and institutional logics. As such, understanding healthcare service transformation requires an integrated perspective that connects everyday practices with broader systemic dynamics, a need to which the configurational analysis responds (Heiberg et al., 2022).

By starting from a new *technological* or *organisational concept* respectively, the case studies illustrate these interconnected dynamics in distinct but complementary trajectories that shape the search for novel diabetes practice approaches. The ProEmpower case represents a techno-scientific upgrade of the practice arrangement bundle that through the introduction of digital tools shifts the site of the practice into the realm of patients. The novel *technological concept* allows a decentralisation of care, reallocates responsibilities, and redefines interactions between patients and healthcare professionals. Thereby, it reframes the practice of diabetes management as continuous monitoring, digital self-reporting, prevention, and remote communication. This can be interpreted as an ongoing biomedicalisation process (Clarke et al., 2010), transforming the patient's role into being an active node in a technologically mediated practice. However, this transformation is contingent on patients' health and technological literacy, as well as their motivation and ability to engage in self-management. As such, the project

surfaced the need for new *organisational concepts*, that provide support roles, particularly nurses equipped to provide technical guidance, allowing an implementation of the new *technological concept* into healthcare routines.

In contrast, the Wienerberg case is a new *organisation concept* that facilitates a service shift through a team-based, interdisciplinary, and spatially anchored model. By restructuring workflows, upgrading the profiles of nurses and administrative staff, the centre reconfigures traditional service architectures to facilitate the implementation of a patient-centre approach within the structure of the Viennese healthcare system. The reallocation of tasks enables a more efficient and personalised care process by allocating more time and interdisciplinary services for each patient, while preserving the integrity of medical decision-making. Consequently, the organisational innovation does not only introduce new roles, pathways, and collaboration approaches but also focuses on centring patients and empowering them to participate in a more sustainable model of care. While the approach is successfully implemented and even scaled, a reconfiguration of the system will require further changes in legal frameworks and demand structures.

Together, these cases illustrate two different transformation pathways: one led by technological extension stretching beyond the realm of healthcare systems into everyday life of patients, and the other by organisational redesign within the system boundaries. Both, however, challenge the established configuration of roles, responsibilities, and interactions in traditional healthcare practice and as such, they illustrate that transformation change in healthcare is not only about introducing new tools or models but about altering the way of how care is enacted, experienced, and sustained (Greenhalgh et al., 2017). With these commonalities, the two cases hint at what a future might entail. Thinking both cases together, a practice building on the "*bits*" and "*bricks*" may be well suited to enable a service shift by providing the organisational context that is needed, for leveraging technology to empower and follow patients' self-management. Protected spaces, like the Wienerberg Centre might provide the organisational flexibility and space for experimenting, learning and negotiating the relations between digital solutions and organisational routines and as such provide the context for the institutional work needed to create the legitimacy generalisation requires (Lawrence & Suddaby, 2006).

The cases further highlight the procedural dynamics of this alignment, with differences in the factors driving the implementation of emerging concepts and the reconfiguration of the system. Implementation as the embedding of novel concepts into existing service architecture depends on aligning them with operational routines, actor competences, and local institutional expectations. In both cases, the need for new roles, training, and supporting infrastructures were present as means to operationalise concepts of patient empowerment or self-management. In contrast, system reconfiguration extends beyond organisational uptake to involve the transformation or discontinuation of dominant concepts, funding structures, and regulatory frameworks. The Wienerberg case illustrates this step, where a promising organisational model begins to scale but encounters barriers at the level of systemic rules, such as standard financing and legal mandates. These observations suggest that implementation stabilises novelty within specific settings, while reconfiguration depends on coordinated shifts in regime structures.

Subsequently, the persistent barriers and misalignments that inhibit the generalisation of healthcare service innovation are dynamic and deeply embedded in the socio-technical structure of the healthcare regime. A first critical barrier arises from conflicting *institutional concepts*, rooted in the normative and identity-based dimensions of healthcare work. In both cases, but particularly in ProEmpower, the redistribution of tasks and the empowerment of patients challenge traditional professional roles and hierarchies. Besides, concerns regarding the quality of care, these changes represent not only new responsibilities but a redefinition of professional identity, which can result in scepticism or rejection (Greenhalgh et al., 2017). Second, the introduction of new *technological concepts*, might result in capacity challenges requiring retraining, introduction of new roles, or other measures to make the novel configuration feasible. Third, the sector's complexity and multi-actor selection system leads to inertia that can undermine efforts to scale or sustain local successes if changes in reimbursement models, budgetary silos, or legislative change are negotiated in multi-level governance systems.

6.7. Conclusion

This paper aimed to advance our understanding of how healthcare service innovations become generalised and contribute to systemic transformation. By applying a configurational framework grounded in social practice and neo-institutional transition theory, it analysed two contrasting but complementary cases to explore how technological, organisational, and institutional concepts co-evolve to pattern new practice bundles for diabetes care. The findings portray healthcare innovation as a gradual and contested process of aligning these concepts into a working configuration as basis for implementing it into practice, generalising it, and reconfiguring the system. The study contributes to addressing the gap in system-level perspectives on healthcare innovation (Broerse & Grin, 2017; Marjanovic et al., 2020) by linking the everyday practices of healthcare professionals and patients with broader questions of systemic transformation.

Conceptually, the study contributes to the literature on the intersection of socio-technical transitions and practice-based change by offering a framework that foregrounds the interdependence of technological artefacts, organisational models, and institutional logics. The framework highlights the interconnected nature of these dimensions within service innovation, generalisation, and reconfiguration processes. As such the study reiterates the centrality of societal embedding (Deuten et al., 1997) as technological innovation requires viable organisational forms, which in turn require institutional recognition, legitimacy, and support. This complementary logic provides a more systemic understanding of why many promising innovations fail to scale and how generalisation depends on relational alignment rather than technical efficacy alone.

Practically, the two cases illustrate the range of strategies and challenges involved in reconfiguring healthcare practices. ProEmpower shows how ideas of technologically facilitated patient empowerment can be limited by organisational inertia and professional resistance, while the Wienerberg centre demonstrates how organisational innovation can succeed while illustrating the systemic barriers the generalisation of such new practice configurations and subsequent reconfiguration faces. Together, these cases highlight that that a sustainable transformation requires intentional alignment work, not only within healthcare practices but also across policy, financing, and regulatory domains. The

observed implementation and reconfiguration processes also suggest that experimental spaces are essential for exploring, testing, and institutionalising new concepts. Reform-oriented healthcare policies, thus, could focus on establishing such protected niches, fostering alignment of novel concepts into working configurations, as foundation for the reconfiguration of sectoral practices based on expanding and mainstreaming successful approaches (Ghosh et al., 2021).

In sum, healthcare transformation is a dynamic process that extends beyond diffusion and involves reconfiguring the architecture of healthcare services through the mutual shaping of technologies, organisations, and institutions. This study underscores that enduring change requires not only innovation but new ways to innovate for practice and systemic transformation. While these findings provide valuable insights, there are also certain limitations to the paper that indicate further research needs. Methodologically, this study is grounded in a comparative case design, which offers analytical depth but constrains the generalisability of results. Future research should explore additional case types, disease areas, and contexts to validate and refine the applied framework. Further, attention should be paid to the transition points between emergence, implementation, and reconfiguration. These pathways, their unfolding in time and space, the factors that drive them and how actors navigate these shifts, hold the potential for better understanding how transformation processes can be accelerated. Additionally, future work is needed to better understand the readiness of configurations for generalisation. While traditionally, the readiness of innovations is described as technological readiness, the readiness of practice configurations for generalisation depends on the co-evolution of the readiness levels of each of the concepts it draws upon (Bruno et al., 2020).

7. Talking about practice: Agency and its structural context in regional healthcare practice change

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Abstract[2]

Ageing societies and rising instances of non-communicable diseases require changes in public healthcare service provision. Despite a plethora of propositions, most innovations never become practically applied. In understanding innovation as a place- and path-dependent change process which depends on actors' agency to reconfigure routinised practices and their structural context, we show how actors create, perceive, and act upon opportunities for change while tracing the development trajectories of two networks in the regions of Murcia and Örebro, respectively. The cases illustrate the role intermediary actors in creating opportunities and shaping organisational and institutional context.

7.1. Introduction: The issue of change in healthcare practice

Healthcare systems, as the sum of all actors, institutions, and resources that undertake health actions, are key determinants of public health and prosperous development of European societies. Today, the sector is confronted with unsustainable development trends like aging societies, increases in NCDs, or workforce shortages. In this context, decision-makers increasingly aim to mobilise the transformative potential of innovation to meet these challenges and to support high quality, safe, and effective care (Barlow, 2016). However, healthcare innovations rarely achieve widespread uptake despite evidence of their benefits (Greenhalgh & Papoutsi, 2019; Saidi et al., 2020) with only one in seven evidence-based interventions being implemented in practice after an average of 17 years (Zullig et al., 2024).

The implementation of innovative approaches into everyday healthcare practice involves directed change agency from individuals and groups and depends on interconnected changes in relations between people, associated technologies, and their structural

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context (Greenhalgh et al., 2017; May, 2013a; Nilsen & Bernhardsson, 2019). Subsequently, studying innovation in healthcare practice, throws us up against the perennial sociological question of what social structure is and the extent to which it enables and constrains human action (Greenhalgh & Stones, 2010). In the study of healthcare implementation processes the concept of structural context is immature (Pfadenhauer et al., 2015) and provides only limited and narrow descriptions (Nilsen & Bernhardsson, 2019). While recent contributions in economic geography illuminated how actors perceive, create, and act upon opportunities for change in its spatio-temporal context (Grillitsch & Sotarauta, 2020; Miörner, 2022). Thus, we combine insights from economic geography with approaches that explain healthcare innovation processes from the perspectives of neo-institutional theory (Micelotta et al., 2017; Smets et al., 2017) and structuration theory (Greenhalgh & Stones, 2010) in a practice-oriented framework that highlights the spatio-temporal context of change agency.

We deploy the framework to study two regions, namely Murcia (ES) and Örebro (SE). Whilst their institutional contexts differ, both regions demonstrate political autonomy over their healthcare systems and face similar challenges. Nonetheless, both regions show very different development trajectories and, as such, we aim to uncover why actors in Murcia see the digital transformation of healthcare as solution for their challenges while actors in Örebro focus on social innovation. We translate this investigation into a question of regional structures and their reciprocal relationship with actors and their change agency. Subsequently, we phrase our research questions as: *How do actors, aiming to transform healthcare practice, create, perceive, and act upon opportunities and structural constrains?* We trace actors' attempts to change practice over five innovation cases in each region. We illustrate how regional trajectories are shaped by path-dependent structures and actor constellations and how intermediary actors build up and apply their agency to adapt the structural context for developing innovative practice.

The remainder of the paper is structured as follows. It begins with a discussion of change and context in healthcare with evolutionary and institutional perspectives. This review builds on sociological, managerial, as well as geographical literature and introduces the concepts of practice, agency, and structure. Based on these elements our research concept is introduced. We subsequently apply this concept to empirically capture the

role agency in the transformation of healthcare practices in the cases of Murcia and Örebro. To conclude, we discuss the implications of these findings for future research and regional development and healthcare policy making.

7.2. Literature Review: Change agency in healthcare practice with an evolutionary and institutional perspective.

The preamble of the World Health Organisation's (WHO) constitution of 1946 defines health as: "*a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity*" (Grad, 2002: 4). Following this definition, health is a condition that enables every human being as well as communities to live productive lives (Broerse & Grin, 2017). Following Murray and Evans, we understand healthcare systems as *"all actors, institutions, and resources that undertake health actions"* (2003, p. 7). These systems are shaped by reductionist medical approaches for identifying the cause of disease, e.g., an alien organism, and taking clinical action to remove or contain it (Farre & Rapley, 2017). This biomedical paradigm in healthcare builds upon techno-scientific advances, and consequently fostered increasing specialisation, where hospitals assume the central place for curative medical action, and a heavily criticised lack of patient agency (Broerse & Grin, 2017).

Following this trajectory, healthcare practices, as the co-produced service between patients and healthcare professional(s), strongly depend on technologies, like diagnostic tools, drugs, or medical devices (Greenhalgh et al., 2017; Nilsen & Bernhardsson, 2019). As such, healthcare practices can be understood as assemblage of entangled technological components and human activities (Fleck, 1994; Orlikowski & Scott, 2008). While single activities are executed by individuals, practices, or bundles of practices, are usually afforded by organisations in a series of activities that follow a division of labour (Smets et al., 2017). The organisation of patient-physicians encounters gives rise to social structures of organisational resource allocation and institutional frameworks (Bodolica et al., 2016; Smets et al., 2017). Hence, the structuration of healthcare practice can be interpreted as a bifurcation between micro-level, everyday practices co-produced by patient and healthcare professionals, and the meso- level contexts of organisation that provide infrastructure and resources, and macro-level of sectoral institutions, incl.,

regulatory, market, and policy frameworks, and logics that shape the field (Greenhalgh et al., 2017; La Rocca, 2018; Nilsen & Bernhardsson, 2019). These practices are specific to their spatio-temporal context, are collectively meaningful, and a source of institutional stability and legitimacy (van Raak & de Haan, 2017).

Today, the sector is confronted with ageing societies, rising incidents of NCDs, attrition of the workforce, and increasing costs, which together render these structures unsustainable (Azzopardi-Muscat, 2020; Broerse & Grin, 2017; Zapata et al., 2023). To address these challenges, decision-makers increasingly aim to harness the transformative potential of innovation (Barlow, 2016; Diercks et al., 2019). However, healthcare innovations often increase costs (Barlow, 2016) and are rarely scaled or spread despite evidence of their benefits (Greenhalgh et al., 2017; Saidi et al., 2020; Zullig et al., 2024), as the system is full of misalignments (Greenhalgh et al., 2018), and impaired by tensions and conflicts arising from contradictory elements in the system's structure (Haring et al., 2022). Further, established modes of evidence-based medicine, as central means for creating legitimacy following the biomedical paradigm, are inapt for assessing multi-facetted practice innovations, (Barlow, 2016; Greenhalgh et al., 2022). Conclusively, the implementation of healthcare innovation needs to be understood as a place- and path-dependent change process (Boschma et al., 2017), which depends on the purposive agency of embedded actors (May, 2013a) to reconfigure an everyday healthcare practice (Fleck, 1994) as well as to establish an institutional alignment between these novel practices, their organisation and the wider organisational field (Greenhalgh & Stones, 2010; May, 2013a; Micelotta et al., 2017). In this understanding, innovations are co-constitutive of the social structures in which they emerge and how they are imagined to create value in varied social, technical, and spatial contexts.

In this context, agency refers to actor's capacity to have an impact on their environment (Stones, 2005). In healthcare, agency is typically distributed between various actors, including clinical entrepreneurs, investors, regulators, healthcare policymakers, payors, healthcare professionals, and patients (Greenhalgh et al., 2018; La Rocca, 2018). These actors deploy different types of agency, for instance clinical entrepreneurship or institutional work (Grillitsch & Sotarauta, 2020; Lawrence & Suddaby, 2006), to bring upon change at various levels, including practice-, organisational-, and system level (Benner,

2023). To explain different development trajectories, Grillitsch and Sotarauta (2020) introduced the notion of opportunity as a conceptual link between structure and human agency. They describe an opportunity space as an actor-specific, place-dependent, and temporal set of circumstances that affords reconfigurations of dominant stabilities: opportunities are formed, perceived, and acted upon by individuals through intentional, purposive, and meaningful actions, against the backdrop of structural constrains.

In healthcare, these opportunities are shaped by the competences and preferences of healthcare professionals and patients (Windrum & García-Goñi, 2008), exiting infrastructure (Saidi et al., 2020) and organisations' capacity and readiness for change (Greenhalgh et al., 2017), as well as the institutional resource allocation and frameworks for evidence creation (Barlow, 2016). However, fragmented healthcare systems and persistent implementation challenges highlight the need for networked and system-level agency (La Rocca, 2018) to overcome different failures that are connected to system change (Weber & Rohracher, 2012). In this context, intermediary actors often provide a systemic perspective and influence the pace and direction of change by creating opportunities, facilitating socio-technical transformations, and through institutional work, particularly in cases where new working practices are required (Boon et al., 2008; Kivimaa, Hyysalo, et al., 2019).

The abovementioned actors operate under partly conflicting logics and values (Greenhalgh et al., 2018) which contribute to tensions and misalignments, resulting in institutional plurality (Thornton & Ocasio, 2008). This plurality opens opportunities for endogenous transformation through change agency. However, it might also impede actors' ability to create legitimacy and trust for routinising new practices (Zucker & Schilke, 2019). Due to the recursive relationship between structure and agency, the resulting struggle between change and reproduction processes continuously evolves at the interface of the micro-meso level as reconfigurations of socio-technical practices may trigger further organisational changes (Greenhalgh & Stones, 2010; Smets et al., 2017). The accumulation of these micro-processes of change can lead to a transformation within organisations or field (Micelotta et al., 2017; Smets et al., 2017). This relationship also plays out at the meso-macro level when change is initiated through the development of new organisational and institutional context, unavoidably implicating

everyday practices. While this change process normally requires a longer timescale, it may well be transformational or discontinuous (Greenhalgh & Stones, 2010). These structural and agential features partly explain why change in healthcare is mostly developmental in scope and the pace of change evolutionary (Micelotta et al., 2017).

7.3. Research Concept: Reconfiguring practice in its spatio-temporal context

From this literature review, we derive a research concept that builds on a relational agency-practice-structure framework of van Raak and de Haan (2017). It combines the insights on change processes of economic geography (Boschma et al., 2017; Grillitsch & Sotarauta, 2020), neo-institutional theory (Micelotta et al., 2017; Smets et al., 2017; Thornton & Ocasio, 2008), and structuration theory (Greenhalgh & Stones, 2010; Stones, 2005). These approaches share compatible analytical and theoretical qualities as they all aim at explaining the dynamics of stability and change in societal systems. As they stem from different academic disciplines, they vary in scale and study subject with economic geography studying industrial paths and innovation systems in connection to regional development (Benner, 2023; Boschma et al., 2017; Grillitsch & Sotarauta, 2020), institutional theory focusing on institutional and organisational change (Lawrence & Suddaby, 2006; Thornton & Ocasio, 2008), and structuration theory generally aiming to describe social-structures and their effects on agency (Greenhalgh & Stones, 2010). As such, they are typically concerned with different elements of the illustration of our research concept as depicted in Figure 9.

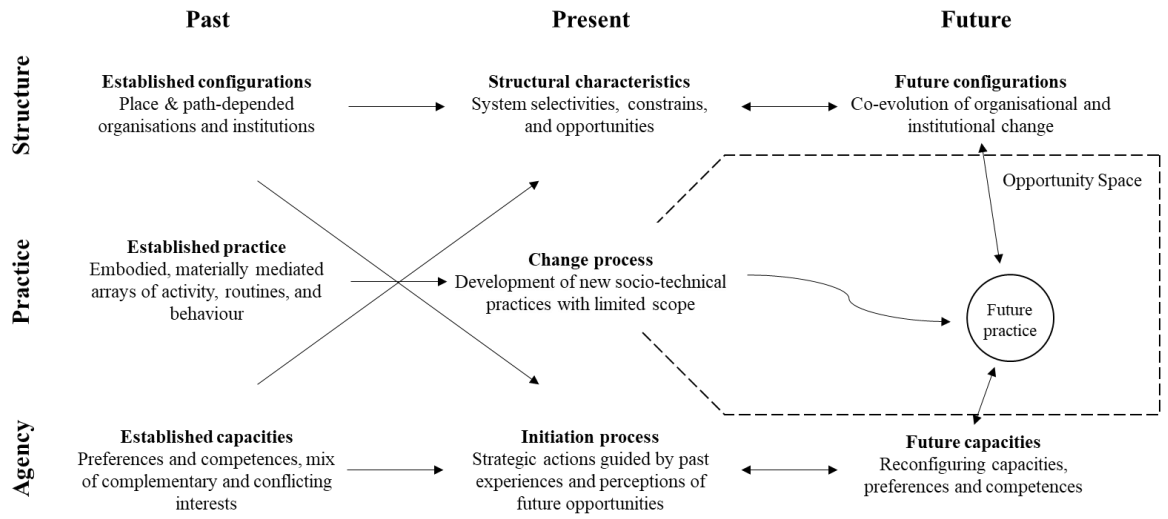


Figure 9: Reconfiguring practice within the structure-practice-agency relationship

Their combination in our analytical framework allows us to describe non-linear change processes within the public healthcare service system, where the development and implementation of innovation involves highly organised, institutionally sanctioned, and systematically regulated changes in the place- and path-depended structural context (Barlow, 2016; Greenhalgh & Stones, 2010; May, 2013a). Subsequently, we conceptualise the framework's dimensions as follows:

- We understand structure as the external conditions of action i.e. the organisational and institutional context in which practice as well as change agency are contemplated and enacted (Greenhalgh & Stones, 2010). It describes social and physical structures that shape and are shaped by existing practice configurations (Fleck, 1994; May, 2013a) that create path-dependency on multiple levels. On the meso-level, organisations provide resources, infrastructure, and a division of labour (Smets et al., 2017; van Raak & de Haan, 2017), as well as social, cognitive, and epistemic boundaries (La Rocca, 2018). On the macro-level, cognitive, normative, and regulative institutions provide stability and meaning to social behaviour (Scott, 1995). These structures provide selectivities for change (Jessop, 2001), which co-evolve through the co-constitutive relationship between practice change and organisational and institutional change.
- Practice is the micro-level and subject of change. Healthcare practice represents an entanglement of technologies and activities (Orlikowski & Scott, 2008) that is routinised in everyday work. As embodied and materially mediated array of human

activity (Schatzki, 2001), practices are performed by and in organisations (Smets et al., 2017). Subsequently, healthcare innovations are new socio-technical configurations that are developed and tested with limited scope to create evidence (Barlow, 2016). Due to the reciprocal relation of structure and agency, any future practice lays in a space-, time-, and actor-specific opportunity space that is shaped by these contexts (Grillitsch & Sotarauta, 2020).

- We conceptualise agency as strategic actions of individuals or groups that build on reflexive use of knowledge, resources, and networks with the aim to change or reproduce practice and, unavoidably, its structural contexts (Grillitsch & Sotarauta, 2020; Suitner et al., 2022). The directionality of these actions depend on actors' embodied knowledge and capabilities (Greenhalgh & Stones, 2010; Stones, 2005), which are shaped by actors' past experiences and perceptions of future opportunities, their preferences and competences (Windrum & García-Goñi, 2008), as well as the political economy as shaped by complementary and conflicting interests of the involved actors (Greenhalgh et al., 2018). The distributed agency in healthcare systems results in a complex multi-actor selection-environment for novel approaches (Windrum & García-Goñi, 2008).

The agency-practice-structure relationship is not stable but constantly renegotiated and co-evolves as future socio-technical practice configurations are negotiated, developed, and implemented. This concept, combining an evolutionary with an institutional perspective on agency, equips us with the analytical lens to understand how actors are constrained, attempt to modify structures, and construct opportunities for the development and adoption of innovative practices in regional healthcare systems. In the next section, we describe how this concept has been operationalised empirically.

7.4. Aiming to transform practice: Two case studies

7.4.1. Methodology

To capture agential contributions to change and stability of practices in regional healthcare systems, we study two regions - Murcia (ES) and Örebro (SE). Both regions participated in a European project researching healthcare policy experiments that aimed at facilitating deliberative involvement of stakeholders in the definition of policy needs

and corresponding responses. Both authors were partners in the project and the empirical material derives from engagements with regional actors that took place in the context of this project. In what follows, we describe each regional context in more detail building on a case study approach (Starke, 2005), as it allows for describing "*phenomena within real-life contexts from the perspective of those involved*" (Boblin et al., 2013, S. 1267). We combine the perspectives on single innovation cases from an actor-perspective with tracing the development of the regional healthcare system (Sotarauta & Grillitsch, 2022), which enables us to describe the reciprocal relationship between agency and contextual structures. We build upon a micro-perspective on agency to identify instances of purposeful human action (Stones, 2005) and actor's capability to reconfigure their everyday work and the structures they are situated in (Micelotta et al., 2017; Miörner, 2022). Observed change or stability of organisational and institutional structures links this agency with its intended and unintended impacts (Greenhalgh & Stones, 2010).

These two different perspectives on the change of practice, covering its agential and structural context, were operationalised as follows: First, five innovation cases as instances of change agency have been analysed following an adjusted innovation biography approach (Butzin & Widmaier, 2016; Suitner et al., 2022), building on qualitative interviews and secondary data. Studying these projects allows us to uncover the actors' understanding and imaginaries of a future working world that are inscribed in the projects, as well as the key changes that are required in contrast to current practices (Larédo et al., 2002). Second, we use qualitative interviews to connect these events, actors, and narratives to institutional and organisational changes to create a link between agency and the spatio-temporal development (Sotarauta & Grillitsch, 2022).

The interview guidelines for the innovation cases (see table A1 of the supplement data) aimed at creating a narrative about the project and covered the dimensions introduced in the research concept. A short characterisation of the innovation cases can be found in A3. The interviews with regional experts covered regional background and trends, organisations and networks, institutions, and strategic approaches towards change. These interviewees either hold central positions in the regional healthcare or the regional innovation system. All innovation cases and interviewees have been selected via a

snowball system that started with central change agents within the regional healthcare systems. In total, 34 interviews were conducted online and in-person during February 2021 and October 2022. Each interview took about 60–120 minutes and was audio-recorded for later verbatim transcription. The innovation case interviews were transcribed and coded in MaxQDA following a deductive approach, building on the nine elements of our framework as depicted in Figure 9. Information on the interviewees can be found in table A2.

7.4.2. Murcia case

The Spanish region of Murcia has around 1,5M inhabitants of which half lives in the cities of Murcia and Cartagena. The economy is specialised along agricultural value-chains and local SMEs that rely on their innovativeness for staying competitive. The public healthcare authority, Servicio Murciano de Salud (SMS), is the biggest employer with around 23,000 employees, in 11 hospitals and 85 healthcare centres and consumes around half the region's budget (MI1). Since the early 2000s, the competences and budgets for healthcare have been transferred to the regional level, leaving the national ministry with a coordinating role. The regional actors see the healthcare system as strong, but the general trend is putting "*pressure on the healthcare professionals*" (MI3), thus the focus is increasingly put on prevention (MI1, MI3, MI10). Especially, the demand on special services (e.g., specialist treatment, rehabilitation) is seen as a threat to the system's stability (MI10), creating an overall perception that current specialist practices risk becoming unfeasible in the future (MI2, MI3, M10).

A network of SMEs around Ticbiomed (TBM), a digital health cluster, addresses these challenges, primarily, through ICT-based approaches for healthcare. Their strategy followed a technology-push approach in developing tools for healthcare, which frustrated actors in- and outside of SMS following barriers like incompatibilities with IT systems or management strategies (MI1, MI5, MI7). To strengthen the regional innovation ecosystem and strengthen the fit of solutions, TBM involved SMS from 2014 onwards in European-funded projects. Through these projects, SMS gained agency as innovation actor and subsequently adjusted its organisational structures by creating an innovation unit (SMS IU). The unit operates as a network within the regional health care system by engaging with representatives from different specialisations and different hospitals (MI2).

TBM emerged as the most valuable ally of the SMS IU (MI1) in addressing the priority fields of chronicity, rare diseases, accessibility, and lifestyle-oriented preventive and predictive approach though innovation (MI1, MI3). Under the umbrella of 'digital transformation of the healthcare system', they use European projects to develop and test self-management and remote monitoring tools building on empowering approaches for NCDs incl. direct communication channels and increasing health literacy (MP1, MP2, MP4, MP5). Importantly, each project builds on the insights of the other. The underlying perception is that these approaches will reduce face-to-face appointments and improve self-monitoring and self-care of patients with chronic conditions (MI10, MI11), while supporting timely interventions and help to prevent future complications (MI3).

> *"We must change the current paternalistic system to one that empowers patients. […] Any innovation that contributes to this empowerment is good and necessary because I sincerely believe that in the future, we will not be able to carry out all the health actions that people expect from us" (MI10)*

During the first projects, solutions for the remote support of physical rehabilitation (MP1) and diabetic patients (MP2) were tested. While technology literacy posed a barrier for patients (MI7, MI10), the integration of technology in the trusted relationship between patients and their healthcare professionals created an effective system that motivated the patients to control their disease (MI11). One of the main benefits was that people "*understand what their disease is and what things they have to do every day to make it better*" (MI11). Nonetheless, neither solution has been adopted in the context of SMS as the pilots' end collided with the start of the COVID pandemic and the gatekeeping role of senior staff and management (MI7, MI12).

To secure the alignment of new pilots with expectations of SMS staff, TBM and SMS developed the inDemand project, which built on a bottom-up demand identification process within SMS. The approach follows a conviction that "*you must create changes in a bottom-up way*" (MI1). To meet these demands, a total of eight pilots (MP3, MP4) were developed, building on open innovation and co-creation methods that were led by SMS. These new approaches highlighted a shift from developing technology towards "*a culture of change*" within SMS that critically reflects current practices and focuses on "*the procedures, the culture, and not on the technology, because technology readiness is not*

a problem. The key to success is to be able to understand the users" (MI1). This change of organisational culture is regarded as central outcome of the project (MI1, MI2). Finally, the CHERRIES project (MP5) opened the bottom-up demand articulation to patient organisations and involved them in co-creating solutions.

During these projects, the agency to shape future practices shifted from companies (MP1, MP2) to the SMS IU, healthcare professionals, to patient organisations. SMS sees this broadening as a way towards developing more inclusive and fair healthcare practices (MI1). While the acceptance of change processes increased among the involved actors, the issue of adoption is still challenging SMS, as intra-organisational inconsistencies between the SMS IU, specialist departments, and the management of hospitals and SMS as such prevail. For example, the MP4 pilot changed the practice of monitoring epileptic patients and provided communication channels to seek specialist services outside normal examinations intervals to prevent epileptic seizures and was evaluated positively. However, hospital management *"didn't understand that approach towards patients. So that's where it stopped."* (MI8).

The organisational tensions between the 'bottom-up' innovations and the management that is performed 'top-down' is frustrating for the actors aiming to change current practices (MI1, MI2). While these actors acknowledge that small bottom-up project not necessarily present a coherent corporate vision (MI3), there is a feeling that the public organisation is too rigid (MI20), slow in change management (MI2) or missing these competences altogether (MI3). Thus, there is an understanding that the digital transformation of healthcare is less about technology than about the ability to change practice and the structural context (MI1, MI2, MI3).

> "I think that promoting the use of smartphones, for example, with good apps where you can exchange information more easily, will have much more impact than artificial intelligence or other hype technologies that are out there." *(MI3)*

The projects TBM and SMS implemented together created an alternative vision of future practices that address the challenges that ageing, NCDs but also obesity create through empowering patients and enabling remote monitoring and support. As these future practices are still contested and subject of an ongoing negotiation process between the different actor groups, changes in practices and structures are not scaled beyond pilots.

The SMS IU is destabilising these structures through the development of alternative futures. However, they face resistance and acknowledge that these changes "*need a maturation process*" (MI20). To increase legitimacy, they seek allies on the level of the regional government, strengthen their relations to EU level policies, and hope to create a duality in structures, much like what happened in the past with digital health records and digital prescriptions, that would allow to implement change and get more actors on board over time (MI3).

7.4.3. Örebro case

The Swedish society and its healthcare system are shaped by a strong welfare state and culture of clubs and Civil Society Organisations (CSO). In terms of multi-level polity, healthcare is a shared responsibility between the national government, regions, and municipalities. With the national level mostly taking a coordinative role, the rural, yet industrial, innovative, and highly specialised Örebro County is the main public healthcare provider running several healthcare centres, and three hospitals with 8.000 employees (ÖI6), serving a population of around 300.000 inhabitants. The County is facing rising costs, human resource shortages, and political pressure to reduce this increase in spending (ÖI6, ÖI10). Since the 1990s the responsibility for healthcare activities gradually shifted to the local level (ÖI13), with the municipalities providing social care including home care and care homes for elderly and disabled. Overall, the health and care systems perform well and provide good access and high-quality care. The multi-level structures, however, lead to coordination failures (ÖI2, ÖI6, ÖI8), gaps between practices with negative impacts on the continuity of care (ÖI2, ÖI5, ÖI8), and insufficient agency of healthcare professionals in implementing everyday work (ÖI2, ÖI5 ÖI13).

Today, these sectoral developments are part of a transition from a historically comprehensive public sector ensuring care throughout the citizens' lives to a situation shaped by resource scarcity and the necessity for stringent decision-making (ÖI6, ÖI8). Despite this shift, the overarching political vision remains focused on providing high-quality healthcare for all citizens (ÖI1, ÖI2, ÖI8, ÖI10).

> *"Traditionally, in Sweden, we have a strong welfare state and therefore, we, the public entities, take more responsibility than we can handle or more than we would need to take if we would do it differently."* (ÖI7)

On the level of municipal services, actors search for new ways of organising healthcare practice adjusted to these circumstances (ÖI1, ÖI2, ÖI3). To support this development from a civil society and social economy perspective, the Regional Development Department of the Örebro County initiated the Partnership for Social Innovation (PSI) in 2015. The PSI incorporates the social economy into the regional innovation support system and connects more than 40 regional organisations, incl. the County, municipalities, CSOs, and the local university, with the aim to "*strengthen the conditions for addressing societal challenges with socially innovative approaches*" (PSI, 2021). Through monthly meetings, the PSI provides the network with an arena for exchange of experience, problematisation, and coordination. Further, it provides support for project development and generally advises on the development of social innovation (ÖI6, ÖI8).

The PSI contributed to an environment in which public actors strategically mobilise international (ÖP3, ÖP4, ÖP5) and national (ÖP1, ÖP4) networks as well as the local cooperations with CSOs (ÖP2, ÖP5) to inform and, further, acquire resources from internal (ÖP1, ÖP2, ÖP4), national (ÖP3), and international sources (ÖP5) to fund projects under the umbrella of social innovation. These projects aim to establish output legitimacy and increase patient agency (ÖP1, ÖP3), initiate inter- and intra-organisational changes to overcome the fragmentation of services (ÖP1, ÖP3, ÖP4), and establish new organisations between the public and CSOs to fill the gaps between existing silos (ÖP2, ÖP5). These initiatives are motivated by the perception that healthcare is too reactive and depending on expensive secondary care while there is too little attention on health promotion, proactive, and rehabilitative measures (ÖI2, ÖI8, ÖI13). These projects are used in a reflexive manner and aim to understand the benefits of new approaches as well as the implications they have on the system:

> *"We try to shape new working methods. But at the same time, we work on things like organisation and competence because when we model the working methods together with employees, we also encounter organisational limits, organisational deficits, or obstacles when it comes to organisation - so we try to change that as we go along."* (ÖI2)

These search and change processes consolidated an actor system that deinstitutionalises current practices and highlights opportunities for change. These

actors mostly work on the municipal level in the fields of school services (ÖP3), social and care services (ÖP2, ÖP4, ÖP5), or on cross-cutting issues (ÖP1) and successfully initiate change and horizontal integration processes. During these projects, actors learn about the challenges they are facing and the implications of future practices. Building on a reflexive use of project results, new practices and structural changes that might divert from project processes are implemented. The learning of the ÖP2 project that supported sign language practitioners in cooperation with a CSO, for example, led to the creation of a specialised team of people being literate in sign language in municipal services, which was not the objective of the original project (ÖI3). To create legitimacy for novel practices, actors deploy learning-by-doing, evaluations (ÖP1, ÖP4), and peer-review via national networks (ÖP3). These actors and their experiences shape a culture of collaboration, experimentation, and trust as "*the experience and lesson that many officials made is that it's not that hard to collaborate"* (ÖI1). At the same time, it is part of a change in "*recognising that we can trust other actors than public entities to determine the needs of citizens*" (ÖI13), following a history of little interaction (ÖI7). However, the number of projects threatens to tire people as they impede routinisation of new practices (ÖI2).

Despite the multi-level cooperation between municipal and regional healthcare providers, changes in the practices or structures of cooperation between these service levels are not evident. Whilst regional healthcare actors are partners and stakeholders in projects (ÖP3, ÖP5), organisational structures and differences in epistemic institutions impede successful implementation of novel practices on the interface of these organisations. The municipal actors see the hierarchy and fragmentation of the regional healthcare system as barrier: "*We had to understand how they do not cooperate internally, […] I needed to involve people on a higher level of hierarchy to come to decisions*" (ÖI5). While there is an expectation from the municipal and CSO actors (ÖI5, ÖI8) to collaborate more closely with the regional healthcare services, especially in the context of preventive and rehabilitative services for elderly people (ÖP5), the regional actors are hesitant as they are facing budgetary constraints and prioritise improving the cooperation between primary and secondary care over opening towards other actors (ÖI10). In this sense, the regional healthcare system's structure is a source of contestation and constrains the development as envisioned by municipal actors with the

support of the regional development department (ÖI10, ÖI6). In general, the institutional differences are perceived as challenging as:

> "*Social innovation is a strange thing for many healthcare professionals because social innovation is something that is well, you don't know what it is when you start, you don't know where you end*" (ÖI6)

The ongoing change dynamics and contestations within the region's healthcare system are driven by diverging perspectives on constrains and opportunities for the development of future practices. The envisioned changes towards future patient-centred and integrated-care practices are part of a "*paradigm shift*" (ÖI10), that is supported by changes in national frameworks for a transition towards "*good and close care*" (ÖI7). These institutional changes in combination with EU project funding (ÖP5), opened opportunities for change agency of local actors that seek to alter the relations between actors and in "*the ways we work*" (ÖI7, ÖI8).

7.5. Discussion

We started this paper with the aim to understand why actors in Murcia and Örebro followed very different strategies to address similar challenges that ageing societies, NCDs, or workforce shortages pose to the respective healthcare systems and what the role of agency is in the context of these developments. To operationalise this research, we developed a practice-oriented framework that captures the transformation of healthcare practice through the micro-level change agency of regional actors in its spatio-temporal, organisational, and institutional context.

Both regions, following the sectoral bio-medical paradigm, created healthcare structures that rely on specialisation and centralisation within increasingly fragmented organisations. This structure creates path dependence on the levels of infrastructure and organisation as well as on level of institutional logics. The professional authority of specialised units and hospitals (Hoogland & Jochemsen, 2000) is an example for such an institution. The main difference between the regions is the organisation of the healthcare systems, which entails processes of multi-level governance in Örebro and processes on intra-organisational change within SMS in Murcia *[past structure]*. These structures demand sectoral practices that require increasing amounts of financial and human

resources, which are not being made available by regional governments, resulting in waiting lists and a perception of deteriorating services *[past practice]*. With these highly institutionalised and systematically regulated structures, there is little concern for patient agency and opportunity for professionals to diverge from protocols even if it seems beneficial for the patients, as indicated by the problematised silos and gaps in monitoring, predictive and preventive approaches *[past agency]*.

Today, change processes that aim to overcome these challenges can be observed in both regions, albeit in different forms. Both developments are based on projects that seek to create new socio-technical configurations *[present practice]*. To support and systematise these search processes, both regions established intermediary actors. Through their system level agency, these institutional entrepreneurs change the system selectivities in favour of experimentation (Miörner, 2022) and transformed the regional opportunity space (Grillitsch & Sotarauta, 2020) and subsequent agency of network actors *[present structure]*. However, the background, interests, and institutional logics of these actors varies between the regions, favouring a supply-driven focus on Schumpeterian entrepreneurship in Murcia and a community- and state-oriented approach in Örebro (Thornton & Ocasio, 2008). The pluralistic field and distributed agency in healthcare requires these actors to set strategic actions for creating legitimacy and embedding changes in the structural context of novel practices (Micelotta et al., 2017). To create this legitimacy and trust (Zucker & Schilke, 2019), actors in Murcia build on demand-orientation and co-creation while actors in Örebro establish arenas for deliberation to create and articulate shared imaginaries of healthcare *[present agency]*.

The co-constitutive nature of healthcare innovation requires coordinated efforts of actors with power to, over, and with (Avelino et al., 2023) to create novel socio-technical, organisational, and institutional alignment (Micelotta et al., 2017). Healthcare innovations are not implemented or scaled when this joint effort does not take place due to agential and structural resistances that arise from contested visions of future practice. In Murcia, these contestations hindered an implementation of single innovations while in Örebro they impeded a widening of the approaches of municipal and CSO actors *[future structure]*. However, the sum of change projects contributes to both shared imaginaries of future practices and deinstitutionalisations of current practices in both regions. In

Murcia, under the umbrella of digital transformation, future practices for anticipative and preventive NCD management that are based on empowerment, systematic data collection and sharing, and remote monitoring emerged. While in Örebro, the integration of social and care work that bridges policy silos and involves new actors, under to concept of good and close care emerged as future practice *[future practice]*. The implementation of such approaches will require a change in capacities and an adaptation in competences to implement everyday work of healthcare professionals and patients alike *[future agency]*.

In both regions, the development process has been initiated and sustained by intermediary actors. The establishment of these actors represents an act of system level agency (Benner, 2023) that can be interpreted as a first level change. While both intermediaries lack formal power, they have clear change-oriented missions and the ability to mobilise resources and networks to reflect and act upon collectively perceived problems. Through networked governance, they draw on a collective capacity and widen the regional opportunity space for change agency based on the collaboration between public healthcare system, industry, and CSOs. Changes in practice, which are observable in Örebro, can be described as second level change. In terms of pathways for change two processes can be observed (Micelotta et al., 2017). The implementation of these developmental practice changes can be described as institutional alignment between practices, organisational, and institutional context, resulting in evolutionary adjustments. Furthermore, the developed imaginaries for future practices represent an institutional accretion of micro-change processes and as such hold the potential for transformational change, which however depend on further changes in organisational culture and readiness for change (Nilsen & Bernhardsson, 2019).

As such, both cases illustrate how actors experience and negotiate the conflicts that arise in a pluralistic field with competing logics whose structures come under pressure. It is essential to understand how pluralistic organisational and institutional contexts facilitate or hinder actors to change healthcare practices. The introduced framework provides a lens to capture the factors and dynamics that shape these opportunities for change and the implementation of future practices.

7.6. Conclusion

In this paper we argued that the implementation of healthcare innovation needs to be understood as a place- and path-dependent change process which depends on purposive agency to reconfigure everyday healthcare practices as well as their structural contexts. As context is a concept that is not well understood in the healthcare innovation literature (Nilsen & Bernhardsson, 2019), we contributed to this gap by introducing a practice-oriented perspective that describes the context as the organisational and institutional social structures that afford the emergence of new healthcare practices. Based on a framework that combines these elements, we address the questions how actors create, perceive, and act upon opportunities and structural constrains. We apply this frame to study the development trajectories of the healthcare systems in Murcia and Örebro.

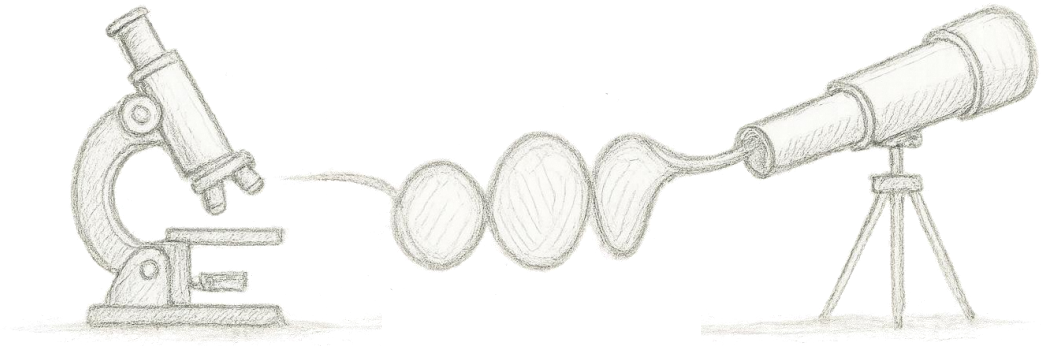
Our empirical cases illustrate that these changes in practice are non-linear processes that depend on distributed agency of various actors with different power endowments. In both regions, intermediary actors are central to these processes and enact their system level agency through networked governance approaches. These intermediaries engage and support others in experiments to develop and test future practices. The generalisation of positive project results challenges actors as they need to create new institutional alignment between future practices, organisations, and institutions. Additionally, the discourse, learnings and engagements in the regional actor systems also contributed to the creation of shared imaginaries of future practices, implicitly carrying transformative potential. Thus, the organisational and institutional changes that became initiated by granting space to intermediary actors and the orientation towards experimental search for new practices can be interpreted as first-level change, while the evolutionary alignment or transformational accretion of practice change represents a second-level change.

These results have implications for regional development and healthcare policy making. Our cases illustrate how the introduction of innovation-oriented intermediary actors can change the system's selectivities in favour of experimental change. This process can be harnessed to develop future practices that are better suited to face trends like ageing societies, NCDs, or workforce shortages. Additionally, we rehearse a need to overcome

system inertias that are rooted in their complexities and multi-actor selection-environment. This requires the ability to orchestrate the alignment of various system elements and a capacity for change management within the public sphere of the healthcare system. Given the challenges healthcare systems are facing, such new approaches are needed to maintain the sector's ability to contribute to prosperous regional development.

Conceptually, we aimed to shed light on the role of agency and its reciprocal relationship with structural context in the transformation of healthcare service provision. While our findings provide valuable insights to this field, there are also certain limitations to the paper that indicate further research needs. First, we introduced a practice-oriented framework to capture change agency and its structural context in healthcare and applied it to innovation networks located in two European regions. To assess the analytical qualities of our approach, applications in different sectors and spatial contexts are needed. Suitable contexts for applying the framework might include studying change processes in other highly structured sectors and publicly dominated services of the foundational economy (Hansen, 2022) or, generally, processes of public sector innovation. To advance the frame regarding scales, healthcare contexts characterised by a stronger role of national levels might bare insights to questions of multi-level governance processes and the way they shape social structures. Second, our cases sketch two different pathways to change (Micelotta et al., 2017). However, there is a need to systematically review how practice change gets generalised within and across systems. Thirdly, and connected to this, there is a lack of understanding of the power struggles between different actors in the definition of characteristics of healthcare innovation and how these play out during implementation or abandonment processes (Avelino et al., 2023; Greenhalgh et al., 2017).

Part III



8. Discussion

This chapter discusses the findings of the three papers as presented in the Part II in relation to the theoretical and conceptual background outlined in Part I. It starts with a section that interprets the empirical results of the three papers in the context of the three research questions of the thesis. Moving beyond the scope of the individual papers, it highlights broader patterns of healthcare innovation and system dynamics evident across the three analyses. The second section discusses the implications of combing praxiological and socio-technical perspectives for studying healthcare innovations and suggests that the meso-level vocabulary of technological, organisational, and institutional concepts and the idea of configurational pluralism can be mobilised to advance cross-over frameworks between praxiological and socio-technical studies. The third section discusses the dynamics of practice configurations, analysing how feasibility and legitimacy are constructed during the phases of emergence, implementation, and reconfiguration. While the fourth section, explores how intermediary actors shape these dynamics of healthcare innovation.

8.1. The results in the context of the research questions

This thesis is set out to explain transformative change in healthcare by linking micro-level changes in the things *people do* with field-level changes. To that end, it developed and tested a conceptual framework that links micro-level changes in the things people do with transformative changes in the affording structures. The framework is tested through three research questions: RQ1 asks about the feasibility of emerging healthcare service innovations. RQ2 examines how legitimacy for transformative innovations is established within the healthcare field. While RQ3 explores how actors create opportunities for transformative change. Together, these questions contribute to the need for a systems innovation perspective on implementation that disentangles technological development from service provision and its affording organisational and institutional structures.

To answer these questions, the thesis introduces a conceptual framework that combines insights from practice theory, institutional theory, and socio-technical theory. This approach combines the strengths of each theory by foregrounding the feasibility of practitioners' everyday actions and, further, illuminating how change gains legitimisation

within a field through power, politics, and agency. Thus, the framework aims to explain social change through the co-evolution of practice bundles and their affording structures, thereby, situating practice change within wider field dynamics and path dependencies. This combined perspective on the transformation of healthcare services guides the synthesis below.

RQ1: How is feasibility of emerging healthcare service innovations achieved?

Feasibility is not a characteristic of a single tool or work approach but must be produced through an alignment of practice elements into a bundle that is sustained in everyday work routines. An innovative practice bundle becomes feasible when people can perform it reliably as activities, understandings, and material form a new workable routine.

Both papers, *Open and Responsible* as well as *Bits or Bricks*, illustrate that feasibility in emerging healthcare services is achieved when a bundle's elements are aligned-in-use. The two studies, thus, show that service innovation consists of a co-evolution of these elements. It consists of technological affordances, organisational arrangements, and institutional support that must align to form a stable configuration. In the experiments described in *Open and Responsible*, feasibility comes into view through a stage-gate process that moves from need articulation, to solution selection, and then to co-creation. Through this process actors align activities, shared understandings, and material arrangements so that a new way of working can be developed and tested. Yet the cases illustrate that the pilots' feasibility remains provisional when the elements are not institutionalised within affording structure, highlighting that alignments achieved during experiments is difficult to sustain once the project conditions end.

The *Bits or Bricks* paper complements these experimental insights through case studies that contrast a technology-led with an organisation-led change process in diabetes care. In the technological case, feasibility hinges on finding a working organisational design, building on a clear definition of roles, support structures, and a reliable integration into technological infrastructures and decision systems. As the practice relays on patient's activities, their competences and motivation necessitate intermediary support addressing gaps in technological and health literacy. In the organisational case, a specialised centre demonstrates robust feasibility by routinising new patient pathways, upgrading nursing roles, and sequencing activities in interdisciplinary teams. However,

the wider scaling still requires changes in financing and legal frameworks that allow further institutionalisation. Across both routes, feasibility is a property of the bundle. Technological concepts realise their promise when organisational concepts redistribute activities that align with institutional concepts that shaping the cognition of practitioners.

Together the papers therefore support a simple proposition. Emerging bundles become feasible when technological, organisational, and institutional change aligns into a stable bundle that aligns what people do, how they make sense of their work, and the materialities they draw upon. However, if these changes lack legitimacy in the field, feasibility remains local and temporal.

RQ2: How is legitimacy for transformative innovations established with the healthcare field?

Building on the finding of *Open and Responsible* that practice bundles draw upon technological, institutional, and organisational concepts one needs to clarify the relation between practice bundles and these concepts, before discussing legitimacy. A practice bundle is the stable and routinely performed alignment of activities, understandings, and materialities, while practice configurations consist of the logics inherent to the technological, organisational, and institutional concepts that shape practice bundles. These concepts, if institutionalised, afford and pattern bundles, and enable a routinised implementation or the replication of elements beyond the site of emergence. In short, bundles depend on the performance through people's activities, while configurations are the field-recognised service architectures that make those bundles repeatable, recognisable, and fundable across sites. Subsequently, *Bits or Bricks* builds on the understanding that legitimacy is not an intrinsic property of a novel bundle but the institutionalisation of technological, organisational, and institutional concepts in the field. Legitimacy is achieved when individual and organisational actors recognise a new way of working as appropriate, credible, and worthy of support, and when it is subsequently sedimented into norms, standards, and regulatory arrangements.

Through this lens, the *Bits or Bricks* paper shows that a stalling generalisation of feasible local pilots can be explained through missing field-level recognition. In the technological case, feasibility was demonstrated through the pilot that indicated the concept's value and specified the organisational support needs, yet no such organisational concept was

developed, leaving the emerging bundle unadopted. Thus, the bundle's concepts were not yet objectified in reimbursement routines, contractual templates, and standards, so feasibility did not accrue legitimacy. In contrast, the organisational case created a feasible practice bundle that is afforded by temporal structures through special budgets, allowing its maturation and scaling. However, a long-term generalisation of the approach requires the adjustments of national regulatory frameworks, which can be described as the sedimentation of the concepts that afford the configuration. As long as these concepts do not recognise the new bundle, it remains a local solution rather than a legitimised configuration that is institutionalised-in-the-field.

Within a mature field like healthcare, multiple concepts co-exist at the same time and are institutionalised to varying degrees. These concepts compete among each other for selection and alignment into workable configurations and bundles. In such a situation of configurational pluralism, it is up to the practitioners to select, implement, and, if needed, further institutionalise these concepts in the field. In such conditions, legitimisation depends on the institutional work of actors to select, align, and generalise practices and concepts.

RQ3: How do actors create opportunities for transformative change within the healthcare field?

An opportunity is a possibility for change that actors form, perceive, and act upon through intentional, purposive, and meaningful action against the backdrop of structural constraints in their specific place and time. Subsequently, opportunities are not given but an actor-specific, spatio-temporal space that is shaped by the institutionalised technological, organisational, and institutional structures of a field as well as the actors capabilities to transform these concepts.

The *Talking about practice* paper shows how actors in two different regions created opportunities for transformative change by establishing intermediary organisations that exercise system-level agency to alter system selectivities in favour of experimentation and thereby widen the opportunity space for change. Through these activities, they convene heterogeneous stakeholders, mobilise resources, and initiate projects that test workable reconfigurations of practice in situ. In Murcia the intermediary took the form of the innovation unit at the regional health authority, which allied with another intermediary

focusing on digital health. Together, these actors shifted the focus of change projects from technology-push to demand articulation and co-creation, generating bottom-up proposals and a culture of change. In Örebro, an intermediary deliberatively created arenas that link municipalities, civil-society organisations, the county, and the university, enabling problematisation, coordinated project development, and horizontal integration efforts that progressively deinstitutionalise incumbent routines. Through their institutional work, these actors altered system selectivities in favour of experimental search for new configurations, which represented a first-level change. In Örebro, actors successfully used this new opportunity space and gradually adjusted practice configurations to open them for collaboration between public healthcare system, industry and CSOs, creating second-level changes.

Thus, intermediary organisations first created shielded niches for experimentation and learning, thereby increasing institutional plurality. Generalising promising results, however, still requires overcoming the inertia that organisational and institutional structures provide to stabilise incumbent practices. To overcome these structural barriers, actors must orchestrate an alignment between new approaches to work and field-level structures within the sector's multi-actor selection environment. Here, intermediaries are pivotal as their activities can expand opportunity spaces by translating across communities and logics, managing expectations, and coordinating the alignment of practices with organisational and institutional field structures. In doing so, they support institutional entrepreneurs in navigating the paradox of embedded agency, which entails that actors draw agency and resources from the very structures that simultaneously constrain what they can imagine and enact. This makes intermediation and networked governance critical to overcoming the inertia of a fragmented field.

In sum, the three answers confirm that the conceptual framework developed in this thesis can be successfully mobilised to study aspects of service innovation in healthcare. These answers also reveal issues that call for closer examination. First, the approach introduces a new vocabulary that requires precision. This thesis proposes that practice bundles are the enacted alignments of activities, understandings, and materialities in use. It further introduces the idea that bundles are shapes by field-recognised architectures that combine technological, organisational, and institutional concepts, which is labelled as

practice configuration. This distinction is then mobilised to further clarify what feasibility denotes at the site of practice and what legitimacy demands at the level of the field. Second, the transformation of healthcare services is non-linear. Bundles and configurations interact and co-evolve, and this interaction is mediated by feasibility, by legitimacy, and by the active selection of concepts and elements by practitioners. Generalisation depends on the translation of feasible bundles into configurations that are recognised and supported but there is a need to better understand the dynamics between concepts through the different phases of generalisation. Third, all three papers point to the central role of translation and intermediation. Interpersonal working relations, interorganisational coalitions, and intersystem dynamics are central for translating novel concepts into working practices. Thus, the role of intermediation for establishing feasibility and legitimacy needs to be discussed further. Subsequently, the remainder of this chapter picks up on these three issues. Section 8.2 specifies the implications of the developed framework and further develops the vocabulary. Section 8.3 examines the dynamics of service innovations through the lenses of concepts and their institutionalisation. While section 8.4 discusses the roles of translation and intermediation for the creation of feasibility and legitimacy.

8.2. Implications of a practice perspective on healthcare innovation

This thesis developed and tested a conceptual framework that combines praxeological approaches (Schatzki, 2019; Shove et al., 2012; Smets et al., 2017) with socio-technical transition theory (Fünfschilling, 2014; Geels, 2004) by building an bridge between these theories deploying concepts from neo-institutional theory (Battilana et al., 2009; Lawrence & Suddaby, 2006; Tolbert & Zucker, 1999). The empirical work and the obtained results demonstrate its applicability to study transformation in service industries like healthcare that entails changes in both, the way work is performed and its systemic affordances. Based on these results, the application of such a conceptual framework has a set of certain conceptual implications and demands a specific vocabulary that will be discussed in the following.

Following the conceptual framework, healthcare services are practices that consist in bundles of interrelated activities, understandings, and material arrangements. Change implies that activities are performed differently, the practitioners' understandings as the

discursive, normative, and interpretive elements that give meaning to a practice are reframed, the configuration of material elements practitioners draw upon are recombined, and, further that these elemental shifts add up to altered routines. The socio-technical transitions perspective adds that practice elements do not evolve in isolation. Technologies, organisations, and institutions co-evolve and develop relatively durable logics that shape what actors regard as an appropriate service. In this combined view, practices remain the locus of enactment while the surrounding organisational field shapes actor's cognition, expectations, and evaluative criteria that either enable or constrain change. In this reading, the organisational field is a constellation of practices that are organised by commanding general understandings shaping a set of technological, organisational, institutional concepts. These concepts are aligned and institutionalised in different degrees, meaning that routinised standard practices draw on highly institutionalised concepts while innovative approaches might rely on concepts, which are considered less appropriate. Thus, the thesis proposes a novel meso-level vocabulary of technological, organisational, and institutional concepts that captures how practice elements are patterned within field recognised templates.

Healthcare service innovation must then be understood as both depending on plurality and as generating plurality within the field. When a new approach is introduced, it rarely replaces what came before with a single improved solution but rather expands the set of possible ways to enact a service. It brings forward new material affordances, alternative understandings of what a good practice is, or how work should be organised. This expansion of possibilities is a structural consequence of innovation in a mature field, which entails that practitioners, managers and other field-level actors are confronted with multiple possible configurations of concepts to implement a practice. Subsequently, selection processes, as the incidence of actors comparing the merits and drawback of different configurations, becomes a central change dynamic. This implies that there is not one practice in the singular, but a plurality of possible practice configurations that coexist in any field at a given time. These configurations differ in how materialities afford work, in how meanings and professional logics guide action, or in the distribution and sequence of activities. Practitioners draw upon and reconfigure these elements during enactment, based on their judgements about which materials to use, which understandings to foreground, and how to coordinate with others. In the context of innovation processes,

these practical assessments are made within a proliferating arena of concepts that claim their suitability for certain configurations in terms of feasibility and struggle to gain or maintain legitimacy. Such a perspective of configurational plurality stresses that the analytical focus in the study of healthcare service innovation revolves around adoption processes. Which highlights the need to understand how actors select and align different concepts into working configurations and how they are generalised (Coelho Rodrigues et al., 2024; Robinson et al., 2024), becoming the recognised and underwritten standard in the field.

Another consequence is that it becomes clear that technological and institutional change require organisational change to be successfully embedded in routinised practice configurations. Practice is often described as action embedded in organisation (Rabadjieva & Zirngiebl, 2023). This description is incomplete when change is at issue, thus, when actions are performed differently, when guiding logics shift, or when material affordances change, organisations must change as well. New practice configurations depend on the definition of role allocations, handoffs, and relations as even modest adjustments in activities and tools can entail consequential redesign of coordination architectures. The *Bits or Bricks* paper illustrates this point in the context of two innovative diabetes care solutions. The technology-led ProEmpower project developed a care setting that focused on remote monitoring, patient self-management, and a continuous communication interface, whose implementation would require the development of new support roles, an increased focus on healthcare literacy, and new routines for handling and processing patient-generated data. The second case, the Wienerberger diabetes centre, is an organisation-led intervention introducing specialised centres and team-based care that redesigns the existing divisions of labour between professions and primary and secondary care. In both cases, practice change hinges on organisational change.

Although practice change manifests in activities, understandings, and materialities, its dynamics depend on the technological, organisational, and institutional concepts that underlie practice. The thesis uses the term concept to denote templates that are recognised within the organisational field and that guide selection and alignment. A technological concept specifies the assemblage of artefacts and information

infrastructures that afford the enactment of work. An organisational concept specifies roles, handoffs, and coordination architectures that pattern how work is performed. An institutional concept specifies rules and evaluative criteria that define what is appropriate, credible, and fundable. Change in practice is stabilised when these concepts result in an alignment of practice elements in a workable bundle and when this alignment is considered legitim within the field. In other words, a generalisation of a practice depends on the feasibility of the bundle as evidenced by its alignment-in-use and, second, by the legitimacy of its conceptual configuration, which is achieved through the institutionalisation-in-field. Treating technological, organisational, and institutional concepts as meso-level templates that structure practice bundles allows for connecting elemental change in practices with field dynamics without importing rigid levels into a practice ontology.

This integrative stance indicates the potential for cross-over frameworks that combine SPT and socio-technical transition theories (van Uden et al., 2024). SPT provides the elemental grammar of activities, understandings, and materialities and explains how micro-level change is enacted. While socio-technical approaches emphasise co-evolution and the emergence of distinct logics that stabilise or unsettle patterns of action across time and across sites. Read together, practice configurations become the point of convergence where elemental change and field logics are reconciled.

In summary, this thesis provides the building blocks for a cross-over framework supporting the convergence between SPT and socio-technical theories by using institutional theory as a bridge between these conceptualisations. Core to this understanding is that practitioners follow field-level technological, organisational, and institutional concepts that provide templates for the alignment of practice elements into a feasible and legitimate configuration. However, not all these concepts are institutionalised to the same degree, and innovation introduces further plurality within a mature field. Hence, observed development trajectory of practice configurations depend on the selection environments and the criteria by which actors judge what to keep, what to modify, and what to abandon. Highly institutionalised organisational and institutional concepts pose a barrier for novel technological concepts, and vis-versa, as their generalisation depends on co-evolutionary changes in these concepts. Arguments for

such changes are depending on the feasibility and legitimacy of novel configurations and, thus, the ability of actors to overcome the configurational misalignment that accompany innovation and often block generalisation.

8.3. Healthcare innovation as dynamics within practice configuration

The previous section introduced a vocabulary of SPT and socio-technical transition theories, to describe healthcare service as a configuration of technological, organisational, and institutional concepts, which in turn are recognised templates used by practitioners to structure and routinise their work. Hence, healthcare service transformation is a process of change within and between practice configurations and depends on the activities of localised practitioners managing these changes, which may unfold via activity-chains through time and space (Schatzki, 2019). Endogenous changes within a focal practice may travel "*from practice to field*" (Smets et al., 2017, p. 375), while exogenous change may befall a practice in the form of an event, prompting practitioners either to stabilise the configuration or to transform it. As service provision is typically implemented on local levels, localised configurations and degrees of institutionalisation of the respective concepts may vary between locations, making the processes of healthcare service innovation place dependent. Further, temporality matters in innovation as the sequencing and duration of events shape the cognition of feasibility and creation of legitimacy, defining whether promising configurations are generalised.

Within a mature field like healthcare, innovation disrupts established practice configurations, producing misalignments that hinder adoption (Coelho Rodrigues et al., 2024). At the practice-level, innovation involves selecting elements that add specific value (Greenhalgh et al., 2017) and integrating them into operations, thereby generating a feasible new practice and supporting its gradual legitimisation and generalisation within the field. The *Bits or Bricks* paper introduces a dynamic perspective on the generalisation of healthcare practices that describes emergence, implementation, and reconfiguration as three phases transforming practice-field relations. While these phases are discussed in detail in the next paragraphs, Table 2 gives a schematic overview of the maturation of the practice concepts throughout these transformation phases.

In the emergence phase the dominant uncertainties are conceptual, requiring actors to engage in sense-making to understand what novel elements actually entail and how they might work in practice. May (2013b) describes this as coherence work during which actors invest their agentic potential in advancing a certain practice configuration. Potential future practices need to display basic workability and the possibility of integration into everyday routines, yet the relation to other elements remains indeterminate. Consequently, what "works" is not an intrinsic property of any element, but the feasibility that actors need to accomplish in practice. The experiments described in the *Open and Responsible* paper with their sequence of an open Call for Needs, a Call for Solutions, and the co-creation of a practice configuration, deliberately staged this indeterminacy to identify divergent logics and to legitimate previously marginal viewpoints. The processes, thus, surfaced opportunities for future configurations by identifying multiple problem–solution couplings (Wanzenböck et al., 2020) before narrowing via selection of solutions and initiating the cognitive participation via co-creation (May, 2013b). In both pilots, new institutional concepts reshaped understandings and narratives of how practices could be enacted, which were subsequently translated into situated configurations through the integration of novel organisational or technological elements. While piloting demonstrated the feasibility of these configurations, their sustainability remains vulnerable without sufficient evidence to establish legitimacy. Emergence can thus be understood as a process of expanding plurality and the unfreezing of routines, which highlights the need to convert early feasibility into legitimacy through institutional work, lest adoption be stalled by complexity across multiple domains.

During implementation, risks become operational as promising practice configurations must be translated into collective actions (May, 2013b) and hold under everyday conditions. This entails an integration with existing infrastructures, connected practices, and an enactment through re-aligned roles, interfaces, competences and accountable governance while testing reliability under routine load (Greenhalgh et al., 2017). The cases presented in the *Bits or Bricks* paper illustrate the challenges novel practice configurations face. The technological concept enabling a remote monitoring configuration, which was developed and tested in the ProEmpower project, showed a strong value proposition and patient motivation, yet exposes capacity gaps. Challenges rooted in the healthcare and technology literacy of patients exposed the need for

supporting roles to sustain enactment, which points to new organisational concepts including new professional profiles. Further, questions of procurement and reimbursement for the technological components remained unsettled, exemplifying findings that missing institutional concepts often block routinisation despite local technical success. The second case in this paper, the Diabetes Centre Wienerberg, demonstrated the feasibility of a configuration operationalising a patient-centred institutional concept through the organisational concept of an outpatient clinic. The centre combines workability and a relational integration in the system, within a configuration that contributes to a service shift strengthening auxiliary staff. Despite being fully implemented within the Viennese healthcare system and about to be replicated, the centre continues to be designated as a pilot, reflecting an institutional ambiguity in its status. An integration into standard operations would require adjusting legal frameworks and financing schemes, which would represent a transformation of the institutional concepts enabling a full reconfiguration of the system. Both trajectories demonstrate that the implementation of practice change depends on the ability of actors to translate feasibility into repeatable practice that is endured through collective action and reflexive monitoring.

Table 2: Maturation of practice concepts

	Technological concepts	**Organisational concepts**	**Institutional concepts**
Emergence	Workability uncertain; systemic integration unclear; value proposition unproven; security concerns; business case undefined	Un-freezing of routines; coherence and enrolment not formed; ownership diffuse; required competencies unclear	Values and norms may be conflicting; de-institutionalisation of incumbent logics; guidelines and legal frameworks undefined
Implementation	Integration into technological configuration; viability and interoperability demonstrated in situ; assessment of scalability	Collective action to re-align roles, workflows, and governance; capacity and skills of practitioners defined and tested; overcoming fragmentation	Value-based conflicts resolved; standards and guidelines negotiated; advocacy and mimicry work for institutional and regulatory change
Reconfiguration	Sustainment achieved in mature solution; systemic interoperability and reliability demonstrated; phase-out of legacy technologies	Refreezing of codified and resourced roles; capability resilient to turnover; reflexive monitoring and learning; stable organisation culture	Legitimacy and incentives adjusted; policy and market arrangements support scale-up and long-term viability; sedi-mentation of new logics

The reconfiguration phase represents the outcome of a practice change process, during which concepts have been stabilised in a new configuration. It is characterised by overcoming structural barriers and managing the long-term risks as well as the institutionalisation of technological, organisational, and institutional concepts in the field, which become recognised across sites. It combines characteristics of the maturation phase of technology diffusion (Rogers, 1962), Lewin's refreezing after organisational change (By, 2005), or the sedimentation of institutional change (Tolbert & Zucker, 1999), highlighting that technological, organisational, and institutional change cumulate in the things people do while enacting practice. Hence reconfiguration, describes the endpoint of a transformation process, which, however, remains an unlikely outcome if actor do not overcome misalignments or complexities in the interlinked concepts that comprise the practice (Zullig et al., 2024). Generalisation becomes more likely when some domains can be simplified to a complicated but governable form (Greenhalgh et al., 2017).

This complexity poses a significant barrier to the development, implementation, and generalisation of practice configurations. Novel activities and as such organisational concepts, challenge competences, attitudes, and identities of professionals and patients (Greenhalgh et al., 2017; Nilsen & Bernhardsson, 2019), and often generate organising tensions that result in conflicts between processes, performing tensions that arise from conflicting goals, and learning tensions that are connected to the destruction of practices in favour of new configurations (Haring et al., 2022). The *Talking about practice* paper highlights how in Örebro organising tensions between municipal and the regional healthcare systems reinforces fragmentation and barriers for adoption of innovative approaches. While the *Bits and Bricks* paper showed how diabetes care innovations induce shifts in staff role and depend on patient's competences. These examples highlight the need to for inclusive processes that negotiate the directionality of change based on professional self-understandings, boundaries, and readiness of skills or infrastructure.

In terms of understandings, institutional concepts need to respect professional attitudes and identity that shape norms and values and subsequently organisational culture (Greenhalgh et al., 2017; Nilsen & Bernhardsson, 2019). Conflicts in understandings may

lead to belonging tensions, which arising from competing identities of individuals (Haring et al., 2022). The *Talking about practice* paper highlights how in Murcia the plurality in professional norms leads to situations where some parts of the healthcare system actively search for digital solutions to modernise practices but fail to implement them against the gatekeeping and resistance of the senior management.

Finally, in terms of materialities, technological concepts must offer affordances within a configuration of technological components (Fleck, 1993b) and ensure both actual and perceived feasibility and appropriateness. This encompasses the accuracy of data and the extent to which such data are accepted, trusted, and considered sufficient for decision-making, as well as the demand-side value proposition, namely evidence of patient benefit and real-world affordability (Greenhalgh et al., 2017). The Cyprus case in the *Open and Responsible* paper revealed the effort required to adapt telemedicine solutions to local electronic records and infrastructures, while the telemedicine solution discussed in *Bits and Bricks* depended on specialised staff to secure workability and data quality. This illustrates that novel materialities and technological concepts become viable only when accurate, user-friendly, and adding clear value in care settings.

This further illustrates how technology and organisation are entangled in these socio-material practices (Orlikowski, 2007) to a point that technological and organisational change are mutually conditioning, and both depend on institutional recognition if a configuration is to be generalised. Hence, this thesis stresses that practice configurations should be the relevant unit of analysis, aiming to capture how feasibility and legitimacy are constructed and travel beyond pilots or single organisations. These categories are central as a configuration that is feasible but not legitimate remains a promising local pilot. While a configuration that results from technology push or policy reform but is not enacted in organisations and in daily routines remains an unfeasible narrative.

8.4. Intermediation, agency, and selection environments of change

From a practice perspective, the world and phenomena within it come about only by being performed through the situated and reoccurring nature of human activities (Feldman & Orlikowski, 2011). Thus, stability and change are both located within practices and are both effortful accomplishments of multiple actors engaged in a practice (Smets et al.,

2017). However, as this thesis shows change in services implies changes in the interactive and interrelated actions of the multiple actors that implement and shape the activities, understandings, and materialities that in their combination make up a service architecture. These interactional changes depend on shared understandings and the availability of competencies of actors as well as material affordances. The papers illustrate the importance of intermediation and orchestration to achieve feasibility, legitimacy, and to develop joint understandings on which concepts to integrate into routinised work.

Intermediation denotes the purposive work of translation, brokering, and orchestration that aligns otherwise misfitting practices, organisations, and rule systems. In line with the literature on transition intermediaries, this work is typically undertaken by an ecology of intermediaries (Kivimaa, Boon, et al., 2019), composed by a set of heterogeneous actors with different remits and degrees of normativity rather than a single honest broker. Their functions range from convening arenas and aggregating capabilities to more explicitly steering selection environments, and they evolve across project, organisational, and system levels as fields mature. In health innovation, intermediary user organisations are also central for demand articulation (Boon et al., 2011), taking roles of a co-producer of technologies and services while navigating representation and positioning dilemmas.

In the empirical material of the thesis these translation and intermediation processes can be identified at three entangled levels: inter-personal, inter-organisational, and inter-system. It contributes to feasibility, understood as making a bundle work in situ, to legitimacy as institutionalisation in the field, and to opportunity selection, understood as shaping which concepts are taken forward.

The inter-personal translation follows the main objective of supporting patients in managing NCDs in patient-centred or technology-focused care concepts that reduce the burden on highly specialised healthcare professionals. As NCDs require long-term specialised care and an active contribution of patients in the form of life-style adjustments, or self-management, they put a significant burden on the individual and requires specific competencies to implement the activities a respective practice requires. In the *Bits or Bricks* paper, two translation dynamics can be observed to support patients. In the first case, a new technological concept aims at translating disease-

specific knowledge to increase the competences of patients while at the same time offering a direct channel to a healthcare professional, which, depending on the organisational concept, could take an intermediating role, providing guidance in simple cases, support patients in the use of the technology, and referring non-standard cases to specialists. In the second case, the organisational concept follows similar aims but focuses on shifting responsibilities from highly qualified medical professionals towards nurses and auxiliary staff to increase the time per patient to support self-management in a patient-centred concept. Similar dynamics are observable in the solutions presented in the *Open and Responsible* paper, where nurses were used to make telemedicine concepts work or novel actors were included in specific settings to bridge the gap between healthcare services and the targeted community. All these approaches relay on reaching patients in their daily live routines, translating medical knowledge and competences to them as a basis for self-management and achieve this via intermediating structures that take the form of novel technological or organisational concepts respectively. This intermediation is central for establishing feasibility of the envisioned patient-centred care settings.

In the context of inter-organisational intermediation the *Open and Responsible* experiments, can illustrate the role of brokerage and boundary object for practice change. A project created a stage-gate brokerage process through a temporary organisational arena that invited regional actors to articulate demand, surface alternatives, and learning through co-creation processes. These processes included individual and organisational actors that normally are not part of such reflections, challenging the technological, organisational, and institutional concepts present in standard practices. This experiment design, aiming at improving a problem identified in an inclusive way, takes to role of a boundary object that supports the co-production of feasible alternatives. Input legitimacy arises from inclusive need and solution selection processes, which in turn build coalitions willing to carry the process forward. This is consistent with the view that transformations require brokerage at the niche–regime interface to align priorities, interests, and knowledge pools (Kivimaa, Boon, et al., 2019).

While this process also holds aspects of an inter-system intermediation process, the intermediary actors described in the *Talking about practice* paper better illustrate these

dynamics. In both cases, regional transformation dynamics are driven by intermediary actors, although with different backgrounds and normative orientations. In one case a coalition of digital healthcare cluster and innovation unit of the public healthcare system aim to introduce novel technological concepts while in the other a network of CSOs strives to overcome sectoral divides between public health and care services. This system-level intermediation concerns the translation between fields, from concepts into practice bundles, and further the institutionalisation of such concepts within their own or neighbouring fields as a basis for making them part of selectable configurations. Thus, they create opportunities, support the creation of plurality in the field, and strive to change system's selectivities as a basis for institutionalising transformative approaches.

What follows form these three levels of translation and intermediation is that they all contribute to the emergence, implementation, and generalisation of service innovations in their own way. The creation of feasibility is characterised by aligning elements of practice bundles in a way that is workable on an inter-personal level. The thesis illustrates that this can be achieved via the implementation of novel roles, technological artefacts, or actors that translate between service users and providers. The nature of these practice bundles, however, is negotiated on an inter-organisational level and, thus, the question which concepts are being selected for development and generalisation depends on brokerage processes within the affording structures. These brokerage processes are closely related to the supply and demand of alternative concepts that might arise from within or outside the field. Thus, inter-system-level intermediation is critical for translating identified needs into transformation agendas and demands that can be addressed by novel concepts, which ultimately are assessed by field level actors regarding their feasibility and legitimacy.

9. Conclusions and contributions

In this final chapter, conclusions are drawn, and contributions are formulated. The first section synthesis the main results of the thesis, delineating the notions of feasibility, legitimacy, configurational plurality, and transformative change in healthcare services. On this basis, the implications of the thesis for advancing cross-over frameworks, combining insights from social practice and socio-technical theory, are presented. It goes beyond presenting contributions by integrating the results of this thesis with the developed conceptual framework, outlining a novel approach to use these theories in unison. The section on practical implications advocates for a transformative stewardship function within the healthcare system that strengthens the systemic capacity to configure innovative practices, based on experimentation, and central intermediary actors. The thesis closes with the section on the limitations and needs or further research.

9.1. Synthesis of the main results

Healthcare systems face wicked problems, where ageing, chronic disease, workforce and fiscal pressures meet rigid and fragmented service structures that impede the implementation of innovative service approaches. The thesis responds to this persistent puzzle by developing and testing a framework that connects micro-level changes in "*the things people do*" during healthcare service provision with a system-level perspective on transformative change. It answers the research questions how feasibility is achieved in healthcare practice innovations, how legitimacy for new approaches is established in the field, and how actors create opportunities for such change against structural constraints.

The thesis introduces the idea that healthcare service can be interpreted as a stable practice bundle that consists of a routinely performed alignment of activities, understandings, and materialities. These bundles are shaped by field-level logics that combine technological, organisational, and institutional concepts, which is labelled as practice configuration. In this context, transformative change is best understood as the interrelated reconfiguration of practice bundles and their affording concepts, which depends on a practice's feasibility and legitimacy as well as on the active selection of concepts and elements by practitioners.

Feasibility is the outcome of an alignment-in-use, meaning that practice elements in a bundle are linked and sustained in everyday work routines. Emerging practice bundles become feasible when technological, organisational, and institutional change is translated into a stable bundle that aligns what people do, how they make sense of their work, and the materialities they draw upon. However, if these changes lack legitimacy in the field, feasibility remains local and temporal.

Legitimacy is the institutionalisation-in-field of the technological, organisational, and institutional concepts that afford a practice so that actors recognise it as appropriate, credible, and fundable. Legitimacy exists when a configuration is recognised by individual and organisational actors and supported by codified rules and regulations. Legitimacy accrues when feasible bundles form recognised configurations that can travel across sites because the field has sedimented the underpinning concepts.

Configurational plurality describes the condition that within a mature field multiple technological, organisational, and institutional concepts coexist with varying degrees of institutionalisation. These competing concepts can be selected and translated into workable practice bundles or reconfigured into alternative practice configurations that practitioners compare, enact, and seek to legitimise. Under this condition, adoption becomes a process of selection and alignment across co-existing conceptual options, rather than a simple substitution of one model by another.

Transformative change occurs when feasible practice bundles are translated into field-recognised configurations by institutionalising the underlying technological, organisational, and institutional concepts so that structures come to recognise and afford the new practice. It is a path- and place-dependent co-evolutionary process of emergence, implementation, and reconfiguration that alters the relations between practice bundles and affording concept configurations that is implicitly coordinated by practitioners and questions of feasibility and legitimacy.

These findings, have implications on both, advancing our theoretical understanding of practice change as well as on the practicalities of steering healthcare innovations and systems. The following two section discuss these implications by suggesting the building blocks for the development of a cross-over framework integrating praxeological and

socio-technical perspectives on social change as well as for developing a transformative stewardship function for the healthcare system.

9.2. Theoretical implications and outlines of a cross-over framework

This thesis builds on three theoretical traditions. While institutional theory is primarily used as an instrumental bridge, the results of this thesis have implications on the theoretical development of social practice theory and socio-technical approaches. Specifically, as it is positioned at their intersection, it contributes to the emerging literature on cross-over frameworks (Svennevik, 2022; van Uden et al., 2024) that seek to relate changes in everyday routines to system-level transformation. The promise of such cross-overs is to connect the powerful micro-textures of practice bundles with the high-level heuristics of socio-technical systems, thereby, overcoming core critiques of both theories. Based on the thesis' results and beyond, this section presents an outline for such a cross-over framework.

In the context of this thesis, the most central critique is that socio-technical transition studies remain on high levels of abstraction and, thus, lack depth and only yield broad pattern descriptions with insufficient granularity on the processes that drive changes in practice. This has motivated scholars to integrate practice-based micro-foundations to analyse contested, power-laden change within regimes. Although praxeological work already informs socio-technical research, systematic cross-over frameworks addressing these weaknesses have only recently accelerated. Conversely, the core critique of SPT in this thesis concerns the tension between its descriptive power and its limited capacity to theorise systemic transformation. Traditional approaches portray change as substitution or re-linking of elements within a relatively stable practice, following Shove et al.'s (2012) materials, competences, and meanings and Schatzki's (2002) practice–arrangement bundles. While these lenses clarify how social elements intertwine with materiality, they offer little leverage points for explaining which alternative linkages are selected, become field-relevant, and travel beyond their site of origin.

Conceptual vocabulary

Building on this diagnosis, this thesis offers a cross-over framework that builds an operational bridge by adopting Fünfschilling's (2014) institutional model of socio-

technical systems while keeping practice bundles as the primary unit of analysis. While Fünfschilling interpreted the most highly institutionalised social and technical structures of an organisational field as a socio-technical regime, this thesis interprets a regime as the highly institutionalised technological, organisational, institutional concepts of an organisational field that provide the logics for enacting a practice in a specific way. They are portable logics that rest on the understandings of interrelated practice constellations that specify how the practice elements of activities, understandings, and materiality should be combined, coordinated, and evaluated so that a practice becomes thinkable, doable, and supportable across sites. Thus, they provide a meso-level that makes visible how social and technical elements co-evolve in routinised use, providing an analytical perspective on the emergence, implementation, and generalisation of practices as well as on the institutional work through which these configurations are rendered feasible and gain legitimacy within a field.

In this understanding, a technological concept is specifying the assemblage of artefacts and information infrastructures that affords the enactment of work. An organisational concept defines the roles and coordination architecture, guiding who does what, when, and how, and how interactions are organised. An institutional concept determines the rules and understanding that pattern what counts as appropriate, credible, and fundable. None of these concepts is sufficient alone. Feasibility arises when they are translated into bundles that are aligned-in-use so that material affordances, human activities, and institutional understandings form a workable bundle that can be routinely performed and replicated beyond its site of origin. Legitimacy accrues through institutionalisation-in-field as the configuration is recognised, objectified, and ultimately sedimented in norms, standards, and regulatory schemes. In a mature field multiple technological, organisational, and institutional concepts coexist with varying degrees of institutionalisation. Table 3 describes these concepts, their elements, enactment, and relations.

Table 3: Defining elements of a practice configuration

	Definition	**Elements**	**Enactment**	**Relation to other concepts**
Technological concept	A field-recognised template for arranging artefacts and infrastructures that enable work. An assemblage whose value is realised only in configuration with organisational and institutional concepts	Artefacts and components; physical infrastructure; data schemas and interfaces; algorithms; integration protocols; performance characteristics and safety constraints	Materiality in use: configurations of components; setup and integration routines; maintenance and troubleshooting approches; local adaptations that make the assemblage workable	Distinct by its material or digital affordances. It does not specify roles, governance, or legitimacy criteria, but co-depends on them for being implemented and generalised in work
Organisational concept	A field-recognised template for arranging roles, interactions, handoffs, decision rights, and coordination mechanisms that pattern and stabilise the performance of work	Role sets and competencies; workflows and handoffs; governance structures; protocols and checklists; local metrics and accountabilities; training and onboarding routines	Activities and their organisation: who does what, when, and with which handoffs; interaction patterns; monitoring and audit routines; protocols and metrics	Distinct by its role and coordination architecture. It does not by itself determine artefact design nor confer external legitimacy, but it organises how technology is used and how institutional demands are met
Institutional concept	A field-level template of rules, norms, and evaluative criteria that define what is appropriate, credible, and fundable, stabilising expectations across the organisational field	Professional norms and classifications; guidance and standards; accreditation; regulatory requirements; shared narratives	Understandings: informal and formal rules applied in practice; social aspects of work; gatekeeping; codified routines; professional examinations	Distinct by its legitimating force. It does not execute work or specify local role design, but it shapes what counts as acceptable practice and underwrites field-wide diffusion

On the premise that multiple technological, organisational, and institutional concepts of varying institutionalisation coexist within an organisational field, the central question is which elements are being picked up, implemented in practice and subsequently institutionalised. This implies that alongside the stabilise and institutionalised way of how "*things are normally done*," alternative conceptualisations exist as less-institutionalised possibilities that can be rendered feasible and legitimate and subsequently reconfigure prevailing practice bundles. This moves the analytical focus of practice change from elemental approaches to the configurational pluralism within a field, offering an abstraction as means to explain how feasibility and legitimacy for certain practice-arrangement bundles are created, maintained, or disrupted.

A praxeological articulation of the multi-level perspective

Analytically a configurational pluralism perspective aims at capturing how certain concepts are mobilised by actors to shape feasible practice-arrangement bundles and how these concepts are legitimised within the field. These kinds of transformation processes can be conceptualised by the analytical grammar provided by socio-technical transition theories. Analogous to the multi-level perspective, a niche could be interpreted as a localised or weakly institutionalised configuration of technological, organisational, and institutional concepts. The focus of the niche work is aligning elements in a feasible bundle and finding avenues for institutionalisation. This happens in opposition to the practice regime, the field-level alignment of technological, organisational, and institutional concepts with high institutionalisation, which acts as a path-depended selection environment because materialities, organisational architectures, and institutional frameworks co-stabilise one another. Further, such a conceptualisation of practices, also allows for a conceptualisation of the landscape, which is lost in most cross-over frameworks (van Uden et al., 2024).

Schatzki defines practices as nexuses of activities and understandings that are meshed with material arrangements into practice arrangement bundles and larger constellations, which "*link into a single overall nexus of practices and arrangements—the practice plenum*" (Schatzki, 2019, p. 44). As there is nothing outside of practices, any social phenomenon consists in some bundle or constellation that represent a slice of this plenum. Subsequently, from a practice-theoretical standpoint, the landscape is not an

ontologically separate macro-entity but can be interpreted as a bundle's relatively exogenous portion of the practice plenum, the vast nexus of interlinked practices arrangements bundles within which any focal bundle is embedded in. What appears akin to the socio-technical landscape are those distant practices, large-scale infrastructures, and institutional orders whose rules, resources, and meanings are highly sedimented, change slowly, and strongly influence feasibility and legitimacy in the focal practice. In such an understanding exogeneity is relational, any element can be outside one bundle yet inside another.

Thus niche, regime, and landscape are heuristics and not ontological tires, they all are practice arrangement bundles and constellations of varying complexity, distinguished by their position towards and the degree of institutionalisation with the organisational field. To understand change and its direction within these constellations, one can draw on the concepts of events and chains of activity as introduced by Schatzki (2019). In this understanding, change arises from (material) events and chains of activity that interconnectedly circulate in and propagate through bundles, resulting in altered bundles or social phenomena. Subsequently, such an activity chain may increase plurality within a field, leaving it to practitioners to determine, through their actions and reactions, whether to reproduce or transform a bundle. Thus, the direction of practice change depends on the situated actions of practitioners and their ability to align exogenous transformations into feasible and legitimate practice configurations.

Agency and pathways of change

Following Smets et al. (2017), change and stability are both effortful accomplishments of multiple actors engaged in a practice. Hence, in the praxiological understanding actors who aim at changing a certain practice bundle face the structural context of the technological, organisational, and institutional concepts that form the regime and landscape, influencing or limiting the choices and opportunities available to actors. These choices are made by diverse actors whose capacities to act are unevenly distributed across organisations and across places and, thus, making it a situated process. As a result, the same intention to improve healthcare will face different constraints and opportunities in different sites. Hence, while purposeful agential contributions are essential to understanding transformation processes, actors' capacity

to act, their position vis-à-vis a focal practice, and the forms of agency they mobilise vary, shaping their role and potential in practice transformation.

First, agency can be directed towards change or be aimed at reproducing and maintaining proven routinised practices including their activities, understandings, and materiality. Transformation hinges on both these processes, as first there is a need to shift the balance towards change-oriented agency to unfreeze institutionalised configurations and, subsequently, reproductive efforts are needed to refreeze a novel configuration and sustain new approaches. Second, these forms of agency can further be distinct regarding their position towards a focal practice. While the agency of practitioners is endogenous to a focal practice, many actors have significant influence on establishing feasibility and legitimacy but are exogenous to such a practice, however, are part of the same or a neighbouring organisational field.

The agency of these actor groups is confined to an actor-specific area of influence, however, as practices are connected within a field, agential contributions travel through activity-chains. From the point of a practitioner, work that begins within a localised practice can travel and motivate field-level adjustment. Equally, changes achieved in the field can affect organisations and reshape what is possible and appropriate at the point of care.

Building on this logic, Table 4 presents four archetypical forms of agency distinguishing them by locus of the actor in relation to the focal practice and the direction of agency. While these forms might overlap, it provides a vocabulary for sequencing actions that together explain how configurations are generated, stabilised, or blocked.

Regarding change agency, these leads to two different processes. Generative reconfiguration is an endogenous transformation in which actors recombine practice elements and make a new bundle perform in everyday work. This innovative entrepreneurship unfolds as an evolutionary process in which practitioners both respond to, and help define, the need and the destination of change. They draw on developments in the field, interpret plurality, and translate concepts into feasible bundles that embed novelty in a practice. While the creation of conceptual plurality expands the set of legitimate concepts available in a field by introducing new technological, organisational, and institutional concepts. Its advancement hinges on institutional work that de-

institutionalises sedimented norms and beliefs, and that tilts selection criteria toward the new by establishing legitimacy for these approaches.

Table 4: Directions and focal points of agency in healthcare innovation

	Endogenous agency *(inside the focal practice)*	**Exogenous agency** *(outside the focal practice)*
Transformation	**Generative reconfiguration of practice:** rearranging the routinised activities, understandings, and materialities, and codifying emergent alignments into feasible bundles.	**Creation of configurational plurality**: shaping innovative technological, organisational, and institutional concepts and selection environments so novel configurations become legitimised.
Reproduction	**Reproduction of incumbent practice:** reproducing incumbent practices by stabilising activities, understandings, and materiality and containing novelty to preserve institutionalised concepts.	**Conservation of field selectivities:** conserving technological, organisational, and institutional concepts and field selectivities that limit legitimate variation and change.

The reproductive or maintenance forms of agency provide the following function. The reproduction of incumbent practice appears as endogenous stabilisation. Under pressure, actors seek to preserve configurations or adjust activities, understandings, and materialities only incrementally while keeping routines intact. These stabilising dynamics can impede innovation, yet they are also necessary to re-stabilise practice after transformation processes. While a further constraint arises from the exogenous conservation of field selectivities, which privileges incumbent configurations through alignment with regulations, standards, reimbursement schemes, training curricula, etc. Such structures afford the enactment of incumbent configurations and limit variation, and in bureaucratic settings bind actors to reproductive agency through strict rule compliance.

These four forms of agency pattern the emergence, implementation, reconfiguration of healthcare systems during service innovation processes. Taken together they interact in shaping the bundling of activities, understandings, and materialities into feasible practices that enact technological, organisational, and institutional concepts in legitimate configurations. Progress does not only depend on the innovative entrepreneurial activities reconfiguring a focal bundle, but also on field-level institutional work, highlighting that legitimacy and feasibility are co-produced through different forms of agency addressing varying levels of a system.

Based on these forms of agency, pathways of change can be conceptualised based on events and chains of activity. Such pathways either originate in one bundle and affect others as exogenous transformation, emerge through the endogenous work of practitioners in a focal bundle, or as a reinforcing combination of these two forces (Fünfschilling, 2014).

First, an endogenous transformation pathway, as a from practice to field dynamic, hinges on the generative reconfiguration of a practice bundle. Thus, embedded actors select elements from non-standard concepts and stitch them into feasible routines that subsequently are legitimised and increase the conceptual plurality on field-level. Second, an exogenous transformation pathway either originates from a shock, pressure, or generally event, like e.g., technological change or an institutional reform that can be located within another practice constellation and befalls the focal practice. It, thereby, opens plurality and conflict within the field that requires institutional work to maintain or transform current routines, through either the generative reconfiguration of practice or the reproduction of incumbent practice function. Third, when endogenous and exogenous forces reinforce one another, pressures can be utilised by embedded actors to create a critical juncture, allowing to increase configurational plurality and accelerate the deinstitutionalisation of incumbent concepts as basis for transforming practices. Importantly, following the praxeological ontology exogenous signifies influences arising from other bundles and constellations that function as external structure relative to the focal practice.

Taken together, the thesis contributes to cross-over frameworks between practice and socio-technical theories by, first, explaining change as an outcome that relys on configurational pluralism, shifting the focus on the selection and alignment of competing concepts and linking practice-arrangement bundles with wider field-dynamics. Second, it introduces the concepts of feasibility and legitimacy as analytical categories to understand the development of practice configurations. Third, it describes the analytical grammar provided by the multi-level perspective as practice arrangement bundles and constellations of varying complexity that are distinguished by their degree of institutionalisation. Fourth, this allows integrating the concept of agency and pathways of

change by showing how endogenous and exogenous transformation dynamics interact to move configurations toward new equilibria in a co-evolving socio-technical system.

9.3. Contributions from a practical perspective

From a practical point of few, three implications are central. First, policy should treat innovation, especially in service industries, as configuration-building rather than artefact development and design support that explicitly targets the alignment of technological, organisational, and institutional concepts. Second, there is a need to develop transformative healthcare policies that provide a transformative stewardship of the future of healthcare practices. Third, an investment in intermediary actors' capacity to coordinate across organisational boundaries, translate between professional, managerial and policy communities, and shape the emergence, implementation, and generalisation of future healthcare practices is needed to accelerate the transformation of the healthcare system.

First, building on the concept of practice configurations introduced earlier, the results of this thesis imply that innovation, especially in healthcare, should be understood as the alignment of technological, organisational, and institutional concepts into a feasible working routine and its institutionalisation within its field. In this understanding, a successful innovation is characterised by two criteria. First, by its feasibility as evidenced by its alignment-in-use and, second, by its legitimacy, achieved through institutionalisation-in-field. These dynamics, cover the processes of emergence, implementation, and reconfiguration of a practice configuration as described in the *Bits or Bricks* paper and require a systemic perspective on practice, its generalisation, and the actors and the dynamics between them in negotiating what counts as legitimate practice.

In highly institutionalised and fragmented sectors, such alignment hinges on deliberate institutional work. The *Talking about practice* paper shows that co-evolution across technological, organisational, and institutional concepts rarely unfolds within a single organisation and therefore demands purposive efforts to connect practices with organisational and institutional structures. The *Open and Responsible* paper illustrates how inclusive, stage-gated processes can diagnose needs, structure problems, set direction, and retain openness while testing novel practice configurations. As such, the

paper illustrates a process that through user orientation enables a translation from articulated needs, into technological, organisational, institutional concepts that signal a concrete market demand. Selection and development in practice-oriented innovation processes should, thus, prioritise appropriate concepts rather than specific artefacts and anticipate their configuration in work routines. In such a process, co-creation then performs alignment-in-use, iteratively stitching technological, organisational, and institutional concepts into a working routine suitable for in-situ testing. Yet pilot feasibility is not sufficient for practice change. As shown in *Bits or Bricks*, generalising promising configurations requires institutionalisation of each concept, a non-linear process of legitimacy building and coordination across actors during which the innovation and its implementation context co-shape one another. Subsequently, the effective support of healthcare practice change requires an explicit coupling of experimental configuration-building with systematic field-level legitimacy work.

Second, such an understanding of innovation requires a targeted support form innovation and healthcare policy. The development and implementation of transformative practices fall within the sector's stewardship function. While often narrowly conceived as regulation setting, stewardship entails setting, implementing, and monitoring the rules of the system (Murray & Frenk, 2000). Stewardship, with its technical and political dimensions, needs to address the changing landscape and critically assess current performances, especially in the context of NCDs, as a basis for setting priorities for the future provision of services. In the context of healthcare innovation processes, the system lacks processes and dynamic capabilities to develop and generalise products and services that balance the ethical, social and legal values of the diverse actors within the healthcare field. Building such capabilities would strengthen intersectoral advocacy, provide directionality for external vendors, install internal processes for managing alignment-in-use, and create institutionalisation-in-field pathways within sanitary and healthcare regulation.

Building on the policy experiments described in the *Open and Responsible* paper, transformative innovation policy (Haddad et al., 2022) and transition management (Loorbach & Rotmans, 2010) provide a general understanding as well as the procedural backbone for advancing such a design. These theoretical concepts, building on inclusive

participatory design, experimentation and learning, provide a general architecture that can be mobilised to embed a transformative stewardship function into the healthcare system. In this understanding stewardship can be operationalised through four different types of governance activities:

- Strategic: Transformative stewardship needs to support a clear problem framing and development of visions of the future working world, convened in inclusive arenas that pursue the transformation of practices via well-aligned configurations.
- Tactical: Based on these visions, a coherent transformation agenda implemented through a programme that finances repeated calls allowing for experimental development of novel practice configurations in protected niches, building a portfolio of potential future practice configurations.
- Operational: The implementation of co-creative projects that perform alignment-in-use in real settings involving healthcare professionals and patients, advancing the first- and second-level learning of key stakeholders.
- Reflexive: Through formative evaluation, a reflexive assessment of the implications of the technological, organisational, and institutional concepts and their feasibility is performed. Clinical evidence is produced as a basis for creating legitimacy and the institutionalisation-in-filed of concepts.

In this line of thinking, to renew to practices of healthcare system the stewardship function should be understood in a broad sense and include the spaces and portfolios in which feasible configurations are developed, and evidence is translated into legitimacy through coordinated strategic, tactical, operational, and reflexive activities.

Third, to effectively operationalise such a policy approach, intermediary actors aiming to transform practices need to be established or strengthened. Intermediary actors are central to transforming socio-technical systems (Kivimaa, Hyysalo, et al., 2019) and can take on strategically inserted into systems to facilitate the establishment of arenas and run tactical and operational interventions. The *talking about practice* paper shows that changes in practice configurations depend on institutional work that exceeds single organisations and that intermediaries, through their agency, can expand opportunity spaces, help de-institutionalise elements of incumbent configurations, and coordinate the alignment of technological, organisational, and institutional concepts across

communities. To play this role in healthcare, they must be embedded within system institutions and combine system-level agency with networked governance, thereby linking local practice change to field-level shifts.

An intermediary endowed with such a mandate is in the position to convey coalition, translate between professional communities, and curate niches. Drawing on insights from transformative innovation policy (Ghosh et al., 2021) and the practice perspective of this thesis, these niche building role rests on structured foresight, evidence curation, and narrative alignment to assemble a portfolio of future practice configurations that integrate promising clinical advances into standard practice. These proto-practices require shielded spaces, e.g., sandboxes, test-sites, living lab, for experimentation and learning in live settings, supporting both first- and second-order learning. The subsequent mainstreaming then involves upscaling within early adopters, replication to new contexts, and circulation of elements and skills, generating public goods. An intermediary can broker the translation of accumulated evidence into technological, organisational, and institutional concepts, helping to convert feasibility into legitimacy. The *Bits or Bricks* and *Talking about practice* papers, alongside the growth of hubs and living labs indicate the potential of this system-level agency for managing the development and generalisation of healthcare practices. However, such intermediaries must be embedded in regime structures to be perceived as legitimate and to generalise new configurations endogenously.

Taken together, the results of this thesis suggest that a transformative healthcare policy needs to i) install a transformative stewardship architecture that sets direction across strategic, tactical, and operational level and reflexively steers changes in healthcare practices, ii) invest in embedded intermediaries that operationalise these stewardship function and possess the dynamic capabilities to coordinate across organisational boundaries, and iii) initiate the experimental search for new practice configurations that are feasible and legitimate for field level actors. Concrete instruments include the establishment of the intermediary actor, fund a research and innovation programme supporting the experimental search for new configurations, and the translation of outcomes into regulations and guidelines.

9.4. Limitations and directions for future research

While the thesis contributes theoretically and practically to our understanding of the link between general work routines and systemic transformation in the context of healthcare, several limitations warrant acknowledgement. Generally speaking, the methodological approach rests on case study research, which attracts criticism for limited generalisability since insights from few cases may not readily apply to wider contexts (Flyvbjerg, 2006; Yin, 2003). Although triangulation across data sources was pursued, the small number of cases constrains replicability and generalisability. The case study research has been approached via two analytical approaches, participatory action research and innovation biographies. Participatory action research generally is more concerned with possibility rather than predictability (McIntyre, 2008) that reveals collective truths and realities but its collaborative nature and proximity of researchers to object of study may reduce critical distance. The second methodological approach, the innovation biographies, is characterised by a strong reliance on interviews, which are affected by time gaps, the willingness of actors to cooperate with researchers, and a difficulty in case selection with a bias towards successful ones (Butzin & Widmaier, 2016). To avoid pitfalls of these methodologies, the data analysis was perused with a strong embedding of observations in theoretical concepts, aiming to mitigate a bias towards a niche vantage point on regime and landscape dynamics.

Further limitations of the thesis arise from the narrow context of the contribution. The thesis targets the mature and heavily institutionalised healthcare field in which standards, reimbursement schemes, accreditation, and professional norms strongly condition selection environments, evidence production, and institutionalisation. Subsequently, healthcare innovations often involve highly organised, institutionally sanctioned, and systematically regulated changes in practice and the structure of these services. The focus on the dynamics around NCDs in regional healthcare system further narrows this context. Thus, processes of generalisation may differ in sectors with lower regulatory intensity, in other domains of the healthcare system, or in non-European settings, and transferability beyond the studied environments should therefore be treated with caution.

Based on the insights from this thesis and these limitations there are a set of fruitful avenues for future research. These avenues include advancing cross-over frameworks, the empirical texting and advancement of concepts introduced in this thesis, as well as investing further efforts in increasing the practical applicability of these results.

From a theoretical perspective, the outlined cross-over framework between SPT and socio-technical transition theory needs to be critically reflected and advanced in several aspects. The core idea is that fields hold a configurational plurality, and it is up to practitioners to select the most appropriate concepts. Thus, there is a need to advance the understanding of the core constructs of such an approach including its concepts and how they relate to praxeological elements across sectors and contexts. Understanding the dynamics between these building blocks in the construction of feasibility and legitimacy is essential for a deeper theorisation of plurality and selection mechanisms, providing a basis for explaining when plurality enables learning and when it instead fragments collective action.

Second, empirical testing and refinement should consolidate and challenge the framework. This work requires comparative case studies across regions with different governance arrangements that test under which circumstances concepts and configurations emerge, travel between practices and spatio-temporal contexts, become generalised, and what the role feedback loops play in this process. Further, these generalisation pathways should be traced across emergence, implementation, and reconfiguration phases to identify intervention points for supporting alignment and legitimation processes and agential contributions contributing to the acceleration of transformative change.

Third, work is needed to advance practical applicability. There is a need to develop and test practical guidance aimed at practitioners and other stakeholders that supports the identification and valuable emerging approaches with transformative potential, support their integrating in bundles, and the acceleration of implementation and reconfiguration. This is closely related to better defining a transformative stewardship function and the identification of organisational anchors for them within the sectoral governance system. Given the institutionalisation of EBM, there is also a need to provide metrics as a basis for adaptive learning and steering of transformation going beyond established approaches.

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