# A Symbiotic Model for Transforming Public Healthcare in New Zealand

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**Craig Joseph Green**


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## Abstract

Given the poor state of public healthcare in New Zealand, this study challenges researchers and practitioners to expand their conceptual repertoire beyond mere cost-cutting and piecemeal improvements to consider potentially transformative business models. It invites stakeholders to consider how they ascribe meaning to behaviour, events, and environments when participating in every aspect of healthcare provision.

A Delphi study garnered expert opinion on the ideal healthcare system for New Zealand, which senior District Health Board interviewees confirmed should involve *equitable access*, *patient-centred care*, *service integration*, and *shared resources*. To deliver this ideal, traditional pipeline model elements and an emergent platform ecosystem were merged, creating a symbiotic, hybrid healthcare concept in which the pipeline's efficient methodical processes and the platform's flexible facilitation of patient/provider engagements combine to offer a context-specific approach to healthcare provision, superior value-based outcomes and fair distribution of resources. Model validation extended to consideration of a comprehensive implementation roadmap that emerged from the main mechanisms and stakeholder behaviours required to transform today's healthcare system.

As the healthcare landscape evolves, embracing dynamic and inclusive approaches that prioritise patients and harness the potential of technological advancements is crucial. By inviting practitioners to reflect on their participation in healthcare provision, this study contributes to the ongoing discourse on healthcare delivery models. It provides valuable insights for researchers, policymakers, and practitioners navigating the complex world of contemporary healthcare.

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## Workshops attended

During my doctoral studies, I attended the following research workshops and health industry-related courses:

- Managing Health Care Delivery 2024 – Harvard Business School, Boston, USA
- Value-based Health Care Delivery: An Intensive Seminar – Harvard Business School, Boston, USA
- Institute for Healthcare Improvement Forum, Florida, USA
- Advanced Lean Training (Healthcare) – Virginia Mason Institute, Seattle, USA
- Lean Healthcare certificate – University of Michigan, Michigan, USA
- Value-based Health Care certificate – Harvard Business School, Boston, USA

## Publications arising from the thesis

*Refereed conference papers (under review)*

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*Refereed journal articles (under review)*

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## Abbreviations and Terms

| | |
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| **Acceptance** | *The act of consenting to receive or undertake something offered. In healthcare, this often refers to the patient's acceptance of treatment or care.* |
| **Accountable Care Organisation (ACO)** | *A group of healthcare providers who come together to provide coordinated care to patients. ACOs aim to reduce unnecessary spending while improving care quality by holding providers accountable for health outcomes.* |
| **Capitated Payment Model (CPM)** | *A payment arrangement is one in which healthcare providers are paid a set amount per enrolled patient per period, regardless of how many services are provided. It incentivises providers to manage care efficiently.* |
| **Care Continuity** | *The degree to which a patient consistently receives care from the same providers or team over time. Continuity is crucial for managing chronic conditions and maintaining long-term health.* |
| **Care Integration** | *The alignment of different healthcare services ensuring that all elements of patient care, such as primary, secondary, and tertiary care, are coordinated and integrated for better outcomes.* |
| **Chronic Condition** | *A long-lasting health condition that requires ongoing management for years or a lifetime. Common chronic conditions include diabetes, hypertension, and asthma.* |
| **Clinical Pathways** | *Structured, evidence-based, multidisciplinary plans that outline the appropriate steps in caring for patients with specific clinical conditions to improve quality and efficiency in healthcare delivery.* |
| **Comorbidities** | *The simultaneous presence of two or more diseases or medical conditions in a patient requiring coordinated management for better health outcomes.* |
| **Continuum of Care** | *A concept involving an integrated system of care that guides and tracks patients over time through a comprehensive array of health services, from preventive care to rehabilitation.* |
| **Fee-for-Service** | *A healthcare payment model where services are unbundled and paid for separately. It may increase healthcare costs as providers have incentives to perform more procedures.* |
| **Health Disparities** | *Differences in health outcomes and access to healthcare services among different population groups are often influenced by social, economic, and environmental factors.* |

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| **Health Equity** | *The principle of ensuring that everyone has a fair and just opportunity to achieve their full health potential. It addresses disparities in health access, outcomes, and care.* |
| **Health Informatics** | *The intersection of healthcare, information science, and computer science involves technology to organise and analyse health records to improve care delivery.* |
| **Health Information Exchange (HIE)** | *The electronic sharing of health-related information between organisations. Designed to enable healthcare providers to access and securely share vital patient medical information to improve care coordination and decision-making.* |
| **Health Literacy** | *The degree to which individuals can find, understand, and use information and services to make informed health-related decisions.* |
| **Health Outcomes** | *The results of healthcare practices and interventions. Typically measured by improvement in patient health status, recovery, or survival rates. Achieving positive health outcomes is a primary goal of healthcare systems.* |
| **Health Systems Strengthening (HSS)** | *A strategy focused on improving the components of a health system to ensure better health outcomes. HSS includes enhancing governance, finance, service delivery, health workforce, and information systems.* |
| **Health Technology Assessment (HTA)** | *A multidisciplinary process that examines the medical, social, economic, and ethical implications of the development, diffusion, and use of health technologies. HTAs are critical in determining the value and impact of new medical innovations.* |
| **Health Workforce Planning (HWP)** | *The process of ensuring that the healthcare workforce is adequately trained, resourced, and distributed to meet the population's needs is critical to healthcare system sustainability and reform.* |
| **Integrated Care** | *A coordinated approach to healthcare that ensures various services, such as primary, secondary, and tertiary care, work together seamlessly to provide continuous care for patients.* |
| **Interdisciplinary Care Teams (ICT)** | *A group of healthcare professionals from diverse fields who work together to provide comprehensive care for patients. This team-based approach is essential in managing complex, chronic conditions and ensuring holistic care.* |
| **Lean Management** | *An approach used to improve healthcare processes by eliminating waste, enhancing efficiency, and improving quality. Lean management principles are* |

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| | *increasingly applied in healthcare settings to streamline operations.* |
| **Manufactured Demand** | *A situation where the demand for healthcare services is artificially created, often by unnecessary procedures or overuse of resources rather than actual patient needs.* |
| **Perverse Incentives** | *Financial or policy mechanisms that unintentionally encourage behaviour that is counterproductive to the intended goals. In healthcare, this could mean incentives that promote overuse of services (e.g., unnecessary tests or procedures) or reward inefficiency.* |
| **Perverse Funding** | *A financial structure in which the incentives may unintentionally encourage inefficient or ineffective practices, often leading to undesirable outcomes.* |
| **Primary Health Organisation (PHO)** | *PHOs are responsible for ensuring that patients receive various health services, primarily through general practitioners, and are funded through capitation and fee-for-service models.* |
| **Quality Improvement (QI)** | *Systematic efforts to improve the quality of healthcare services by optimising care processes, enhancing efficiency, and improving patient outcomes. QI initiatives are essential for ensuring continuous improvements in healthcare delivery.* |
| **Results-Based Accountability (RBA)** | *A performance management framework that focuses on achieving measurable improvements in population health outcomes. RBA assesses the effectiveness of healthcare programs and policies, focusing on accountability and results.* |
| **Social Determinants of Health (SDOH)** | *The conditions in which people are born, grow, live, work, and age, including factors like socioeconomic status, education, environment, and access to healthcare. SDOH significantly influences health outcomes and is a critical consideration in public health reforms.* |
| **Telehealth** | *The use of technology to deliver healthcare services remotely. It allows patients to consult with providers through video calls, messaging, and other digital platforms.* |
| **Triple Aim** | *A framework developed by the Institute for Healthcare Improvement (IHI) focused on optimising healthcare performance by pursuing three dimensions: improving the patient experience, improving the health of populations, and reducing per capita healthcare costs.* |
| **Value** | *In healthcare, value is defined by the outcomes achieved relative to the costs incurred. It is a measure of efficiency and effectiveness in delivering care.* |

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| **Value-Based Care (VBC)** | *A healthcare delivery model in which providers are rewarded for delivering high-quality care and improving patient outcomes rather than the volume of services provided. VBC seeks to create a more sustainable and equitable healthcare system.* |
| **Whakarongorau** | *A Māori term that signifies active listening and responsiveness in care. It is central to patient-centred approaches, ensuring that care respects individual patients' needs, particularly regarding Māori health.* |

# Chapter 1: Introduction

## 1.1. Background and research context

Against a backdrop of heightened consumer expectations and emergent business models promising the possibility of transformative change, this chapter opens the thesis by outlining today's significant challenges facing public healthcare services worldwide. It sets the stage for a comprehensive exploration of the factors influencing New Zealand's readiness to embrace *collaborative* healthcare provision, and it outlines the study's overall scope and objectives, research questions, and significance.

Public healthcare in New Zealand and around the world is facing formidable challenges, including inadequate funding, the exorbitant cost of capital-intensive equipment, shortages of skilled personnel, and ever-increasing demands from patients suffering multiple comorbidities (Balogun, 2021; Carson et al., 2024; Mataria et al., 2021; RNZ, 2024; Wong-Hammond et al., 2013). Such challenges underscore the pressing need to identify the most effective healthcare management techniques and the practical steps for transforming today's healthcare system to deliver needed outcomes.

Today, New Zealand's publicly funded health system, which originated in the mid-eighteen hundreds when Governor George Grey created the first public hospitals (Dow, 1995), is variously described as being 'in a state of crisis' (ASMS, 2024). Many changes have occurred over the years, including in the present century, the passing of the New Zealand Public Health and Disability Act 2000, which came into force on 1 January 2001 (New Zealand Legislation, 2000). This Act led to the establishment of 20 District Health Boards (DHBs) and three distinct arms: a *Provider Arm* (public hospitals), a *Funder Arm* (the funder of Primary Care, Non-Government providers, and Internal Service Level Agreements with the Provider Arm), and a *Governance Arm* with Boards and statutory committees.

In March 2021, New Zealand's Labour-led coalition government confirmed the details of health system reforms in response to its *Health and Disability System Review* (Department of the Prime Minister and Cabinet, 2021). The changes aimed to achieve a vision of *pae ora | healthy futures* for everyone in New Zealand by addressing longstanding barriers to achieving equity, reducing variation, and supporting collaboration and partnership across the health sector (Ministry of Health, 2022). The *Ministry of Health* would focus on policy, strategy, and regulation. At the same time, a new body, *Health New Zealand*, would oversee the planning and commissioning of services and the functions of the 20 DHBs to eliminate duplications and offer proper national-level planning. Moreover, a new *Māori Health Authority* would work alongside *Health New Zealand* to achieve improved services and equitable health outcomes for Māori

(Ministry of Health, 2021). Consequently, on 1 July 2022, the DHBs were formally disestablished and replaced by *Health New Zealand* (Te Whatu Ora) and the Māori Health Authority (*Te Aka Whai Ora*), together tasked with managing healthcare delivery on a national scale (Health New Zealand, 2024).

While core health services like hospitals and primary care essentially remained unchanged, the reforms marked a decisive shift towards centralisation. However, following a General Election on 14 October 2023, the newly elected national-led coalition government initiated a significant policy shift reversal, with a renewed emphasis on regional decision-making and equal access to healthcare for all New Zealanders, irrespective of race. The Māori Health Authority was disestablished as part of the new orientation.

At the time of writing, New Zealand's healthcare landscape consists of three primary providers:

1. *Primary Care Providers* operate under a quasi-public funding model through capitation based on General Practice (GP) enrolments, with the right to charge a co-payment for services. Government subsidies reduce the cost of GP visits, pharmaceuticals, and diagnostics, allowing GPs to function as small businesses, sole traders or partnerships. While this model supports equitable access, mainly through schemes like *Very Low-Cost Access*, co-payments create barriers for some populations.
2. *Public Hospital Care* is delivered at secondary and tertiary levels. Secondary hospitals provide general acute (emergency) and non-acute (elective) services. Tertiary hospitals in the major urban centres — Auckland, Hamilton, Wellington, and Christchurch—offer advanced specialised care and require highly specialised skills and technology not available in secondary hospitals. Under the reforms, there is a push for greater integration between these levels of care to improve regional access and patient flow.
3. *Private Hospital Providers* primarily focus on elective surgeries and specialties. These first emerged to manage long waiting lists in the public system for non-acute services. Private hospitals continue to offer earlier access to services like joint replacements and hernia repairs, usually funded by health insurance or personal means. Although private hospitals complement the public system, their fee-for-service model creates access barriers that contribute to health inequities between wealthier and underprivileged populations.

Central government funds the public health sector in line with forecasted population growth, with adjustments made for demographics, deprivation, rurality, and availability of tertiary-level care. Side contracts add to the funding pool. Since 2001, the variations in funding and governance between the providers have caused primary and secondary care to develop separately, creating myriad inefficiencies and waste. Consequently, New Zealand's present health system lacks integration across the provider network,

leading to duplications/triplications of work, ineffective referral pathways, and funding streams that detract from delivering patient-centred care that respects individual patient needs. Also, 'perverse incentives' between the public and private care providers might see the same clinicians working in both arenas on the same day, driving variations in productivity, clinical output, quality, demand, and reimbursable cost (Cumming et al., 2014).

According to Finkelstein et al. (2012), discussions on the future of healthcare must be conscious of the increased emphasis on patient-centred care, an evolving technology landscape, and growing concerns about healthcare service affordability. Understanding and addressing patient expectations is paramount since today's consumers expect more than just healthcare access; they demand reliable, accessible, high-quality services personalised to their unique needs. This shift emphasises the importance of requiring healthcare organisations to empower patients to participate actively in decisions about their health. Shared decision-making, patient engagement initiatives, and patient-generated health data are integral to this evolving paradigm (Frenk et al., 2010). Thus, the rapid integration of technology into healthcare, including electronic health records (EHRs), telemedicine, and wearable devices, offers the potential to meet these consumer expectations. EHRs, for instance, can enhance the accuracy and accessibility of patient information, while telemedicine increases access for those in remote or underserved areas (Finkelstein). The affordability of healthcare services also looms large in the minds of consumers. As healthcare costs continue to escalate, alternative payment models such as value-based care and bundled payment models become imperative for addressing these concerns (Frenk).

In broad terms, a business model for the health sector refers to the framework or plan that outlines how a healthcare organisation or provider intends to operate, deliver services, and generate revenue. So-named pipeline business models that emerged during the industrial era have expanded to encompass everything from manufacturing to healthcare (Detsky & Garber, 2016) so that today's patients enter a 'health production pipeline' at one end, generally via their GP physician or the Emergency Department (ED) and eventually emerge from the other end following treatment. The flow of value is linear, from the producer to the consumer. However, rather than addressing the demands of patients who need medical interventions, care is often untimely, inappropriate, or not required. For instance, risk-averse clinicians may request extra diagnostic tests or a hospital admission, and a system error may create a referral or a diagnostic test based on a schedule rather than actual clinical need. Due to the various nuances of 'perverse' funding mechanisms and 'manufactured demand', the health production pipeline has resulted in complexity. The sector is buckling under complexity, an ever-increasing number of patients and a slew of expensive new medical interventions. The different levels of care that the public and private health systems offer affect available

expertise. Clinical preference and comorbidities (typically involving diabetes and respiratory and cardiac issues) also impact the present pipeline model's performance.

The difficulties besetting today's overly complex public healthcare system call for urgent research that offers insights into alternative business models able to transform the healthcare sector and the factors affecting adoption (Babatunde, 2024). Models such as the *Product Leader* model (Shahzad et al., 2013), the *Experience Leader* model (Pine & Gilmore, 1998), the *Integrator* business model (Porter, 2008), and others described in Chapter 2 offer some unique advantages that could contribute to a more efficient and patient-centred public health sector in New Zealand. However, the final model choice would depend on the specific challenges and opportunities within the industry and may involve a selection of elements from different models.

In summary, a confluence of political and commercial factors is helping propel alternative business models in healthcare (Ventola, 2014). Policy initiatives to expand coverage and improve access to care have created a conducive environment for adopting digital technologies (Shi & Singh, 2015). For example, telemedicine and telehealth, which can improve patient care and healthcare delivery, have been discussed extensively (Kvedar et al., 2014). Such technologies and strategies associated with 'connected health' have the potential to transform the healthcare sector by enhancing access, reducing costs, and improving patient outcomes, making the intersection of healthcare and alternative business models an intriguing avenue for research.

## 1.2. Motivation for the research

The author's motivation for this research stemmed from personal experience transitioning from the corporate sector to New Zealand's public healthcare system. This switch exposed stark differences in accountability for patient-centred care, health outcomes, waste reduction and fiscal management (Balogun, 2021; Wellman et al., 2017). For example, with an audited deficit for the preceding year of $1.049 billion[1], New Zealand's DHBs reported a combined deficit surpassing $711 million for the 2020/21 fiscal year, including an estimated $20 million in COVID-19-related costs (Ministry of Health, 2021). In examining the fiscal health of New Zealand's DHBs in 2021, the Honourable Andrew Little, Minister of Health, noted that they had all reported annual deficits in 12 of the 13 preceding years, indicating that expenditures consistently exceeded the funding provided by the Government. Such deficits compelled the DHBs to

[1]New Zealand Dollars

deplete other financial resources, including those earmarked for hospital maintenance. The uneven distribution of the deficits nationwide, amounting to some $3.5 billion over the period, created considerable uncertainty among patients, health system strategists, and the workforce (Little, 2022).

The fiscal challenges and disparities in health outcomes have led to critiques of New Zealand's healthcare sector as being 'in a state of crisis', with access to quality care seeming to depend on one's postcode, a situation that appears to be ongoing (ASMS, 2024; Kotzian, 2008). This condition contrasts with the commercial world, where exponential growth in digital technology-enabled platform business models enables value-creating interactions between external producers (those producing value) and consumers (of value). Due to multi-sided platform dynamics (Evans, 2012), fuelled by reinforcing network effects (Farrell, 2007), platform ecosystems exhibit a specific structure of economic relationships between interdependent firms (Adner, 2017).

The traditional healthcare business model appears no longer sustainable, struggling to meet the changing needs and demands of populations while also addressing rising costs, an ageing population, and changing patient expectations. Moreover, the sector faces significant pressures, including an increasing burden of chronic disease, advances in medical technology, and a growing demand for high-quality, patient-centred care. These pressures drive the need for transformation to remain sustainable, effective, and efficient. Thus, the primary motivation for this research is to investigate a paradigm shift in New Zealand's public health sector towards a system that prioritises patient needs, ensures financial viability, and promotes equity. The pressing challenges facing healthcare systems globally also drive the need for such a study (Berwick et al., 2008). Due to having similarly ineffective systems, authorities worldwide are trialling new modes of healthcare delivery that may lead to equitable, accessible, and financially sustainable healthcare (World Health Organization, 2010). They may also remove the burden of work, reduce patient waiting time and rework, and address clinical fatigue, financial unsustainability, and patient distress (Porter & Teisberg, 2006). Hence, this study is critical because it provides insights and recommendations of global interest for those seeking to transform and modernise their healthcare delivery systems. The study is also an opportunity to acknowledge the factors contributing positively to today's healthcare system in New Zealand and examine the transformation challenges.

Some evidence suggests that combining platform technology with telehealth, wearable devices, and artificial intelligence (AI) could help transform healthcare delivery since, in principle, platform business models can address health system inefficiencies and community inequalities head-on. They use technology to connect people, organisations, and resources in an interactive ecosystem where 'amazing amounts of value can be created and exchanged' (Parker et al., 2016). Unlike the pipeline business model, platform

business models operate as networks, often intermediating between different 'sides'. Effectively operating as an exchange, 'platforms' facilitate interactions, reduce transaction costs, and help with matchmaking across specific user groups. In supply chain terms, platform business models dynamically link producers with consumers (an organisation can simultaneously be a producer and a consumer). Although this business model is emergent, the proliferation of digital technologies coupled with improved access to the Internet through mobile devices provides extra impetus for investigating this model for healthcare provision (Srinivasan, 2021). The characteristics of 'platforms' and 'pipelines' are described in later sections 2.2.5 and 2.5, respectively.

## 1.3. Research scope and objectives

Qualitative research findings can be valuable *instrumentally*, *symbolically*, or *conceptually* (Estabrooks, 2001). "Instrumental utilisation is the concrete application to practice of research findings translated into material forms, such as clinical guidelines, care standards, appraisal tools, pathways, intervention protocols, or algorithms" (Sandelowski, 2004: p. 1371). While *symbolic utilisation* may be a precursor to instrumental utilisation, it is less visible and concrete as it entails no change per se but rather the use of research findings as a persuasive (or political) tool to legitimate a position or practice. Finally, *Conceptual* utilisation is the least tangible, "as it entails no observable action at all, but rather a change in how users think about problems, persons, or events" (p. 1372).

Giannoccaro and Pontrandolfo (2001) define conceptual models as either descriptive tools that consider the main aspects and variables of a specific problem or empirical structures that propose guidelines for the main issues related to a modelling domain. This study challenges researchers and practitioners to expand their conceptual repertoire for thinking about how to transform New Zealand's healthcare sector beyond the usual cost-cutting and evolutionary attempts, to consider interactions with others: how they participate in all aspects of healthcare provision, ascribe meaning to behaviour and things, and interpret how they see themselves, events, and environments. In short, it aims to conceptualise a new business model for optimal healthcare delivery and the associated delivery strategy.

Hence, the research described in this thesis considers the *possibility* of a new business model as a potential digital disruptor within the New Zealand (NZ) health sector to transform the traditional pipeline model. If history is any guide, adopting a new healthcare model that delivers care to most patients is the only way to transform the NZ healthcare system.

The scope and objectives guide the researcher's efforts and determine a project's success or failure (Ward, 1995). Scope refers to the parameters under which the study will operate (Simon & Goes, 2013), without which the study objectives can be vague, and the researcher can lose sight of what is being developed (Clarke, 1999). Factors constraining the scope of the study include the available time, finances, and research competence. This research investigated the health system status, viable alternatives, and the perceived implementation obstacles and enablers of a suitable new operating model for the New Zealand health sector.

Specifically, the research sought answers to the following research questions:

RQ1: What business model is best suited to delivering New Zealand's ideal healthcare system?

RQ2: What are the critical enablers and barriers to implementing such a business model?

RQ3: What can the relevant stakeholders do to address the barriers effectively?

Three secondary research questions support the above:

SQ1: What are the characteristics of the ideal New Zealand healthcare system?

SQ2: How does the platform business model differ fundamentally from the pipeline business model concerning the dominant value creation logic?

SQ3: What are the advantages and disadvantages of adopting a platform business model for healthcare provision in New Zealand?

Thus, in the face of increasing patient wait times, medical costs and comorbidities, and an ageing population, the study sought to identify the factors influencing the health sector's readiness to engage in collaborative healthcare provision. The study considers that transforming patient pipeline 'value streams' (in secondary and tertiary healthcare settings) involves two primary dimensions (Kumar et al., 2012). The 'internal transformation' dimension considers change management practices, operations management, business process reengineering, and organisational behaviour. The 'external transformation' dimension focuses on external relationships, including those of affected stakeholders and their relative power and dependency. The obstacles and enablers to transformation, which may belong in either dimension (Shortell et al., 1994), are fully described in Section 2.10.

## 1.4. Investigating the ideal health care system in practice

Identifying what occurs within a company/industry sector from a conceptual point of view is extremely helpful for understanding the system, detecting irregularities and suggesting improvements. This thesis adapts the conceptual modelling methodology of Hernández et al. (2008) outlined in Figure 1.1, establishing the phases to consider when developing a conceptual processes model.

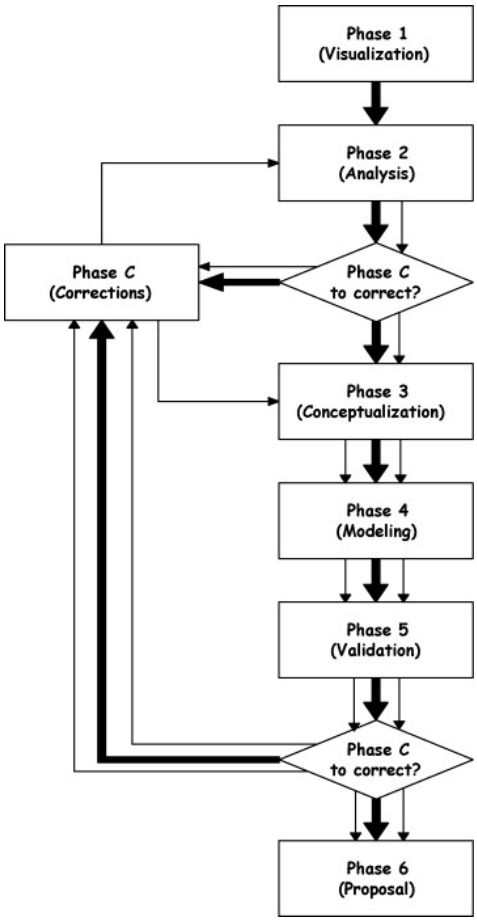



**Figure 1.1. Conceptual modelling methodology**

Source: Adapted from Hernández et al. (2008)

A model is an artefact that can be mapped onto a phenomenon one struggles to understand. By examining it, we can increase our understanding of what we are modelling. The Hernandez model was chosen for its fit with the study. While it did not need to be adapted, it was simplified. Specifically, this research follows the six-step approach shown in Figure 1.2 to yield a new conceptual healthcare model – i.e., an empirical structure that proposes guidelines for addressing the main problems related to the modelling domain (Giannoccaro & Pontrandolfo, 2001). It also gives practitioners clear guidance by providing the assessment

tools and techniques for each identified step. Akin to the Hernández et al. (2008) model, the study begins by gathering information on the underpinning theory and identifying research gaps that ultimately define the research problem. Primary data collected from subject matter experts in a Delphi survey and senior healthcare manager interviews captured the characteristics of an 'ideal' transformational healthcare system. This information informs the representation of the system in the conceptual model, describing the relationships between the components (variables) within the new system that are crucial to understanding the system's dynamics. Understanding the barriers and enablers to transformation provides pointers to creating a transformation roadmap. Finally, the model's validity throughout the model development and refinement process is a critical focus.

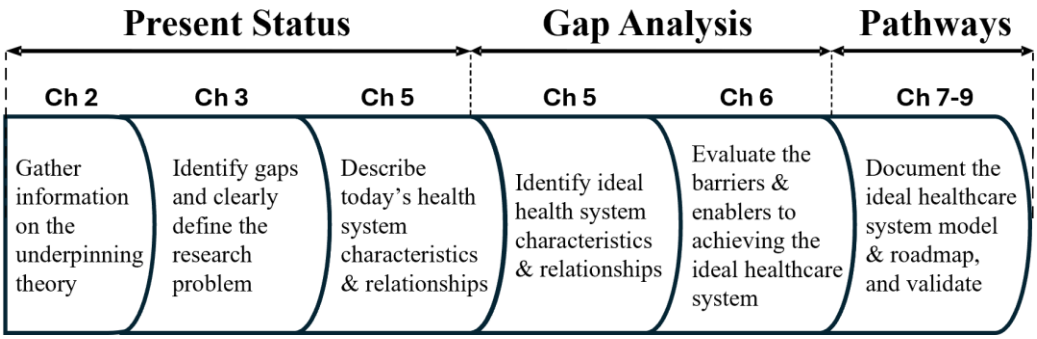



**Figure 1.2. Procedure for achieving the ideal healthcare system in practice**
Source: The Author

## 1.5. Significance of the research

Regarding theoretical contributions to supply chain process innovation, this mixed-method research extends knowledge of platform ecosystems for satisfying dynamic patient demand. By iterating between expert opinion and hypothesised theoretical models via mixed-methods qualitative research, this study evolves a hybrid and synergistic platform/pipeline model and associated understanding of the system dynamics for successful implementation. It extends digital business transformation and process innovation knowledge by identifying the governance and information systems that underpin effective healthcare services. By showing how platform network effects can disrupt the healthcare industry, the discourse also offers opportunities for IS researchers to re-establish their relevance in healthcare supply chains.

International comparisons, such as the NHS digital transformation, Singapore's integrated healthcare system, and the Mayo Clinic's platform-driven approach, also provide valuable context. For example, the proposed symbiotic healthcare model directly supports Porter and Lee's (2013) value-based healthcare model/strategic agenda for transitioning to a high-value healthcare delivery system.

In terms of practical contributions, this study adds to the knowledge corpus by revealing obstacles and enablers of sustainable platform business model implementation set against the present government's policy climate. Through understanding the factors that enable platform model producer/consumer relationships to form on a shared platform, the research provides a partial roadmap for DHB producers and consumers. A focus on optimising provider resources for mutual stakeholder benefit makes further critical contributions to operations strategy. Finally, by viewing healthcare holistically as a system, the study should trigger research interest in secondary and tertiary healthcare, such as the complex, proactive and reactive practices that underlie counselling and disability support services. Specific platform research in all these areas is lacking.

## 1.6. Thesis structure

This thesis comprises ten chapters. Chapter 1 presents an overview of the thesis, including the research motivation and how this study contributes to knowledge.

Chapter 2 investigates the underpinning theory, particularly the pipeline model's attributes that contrast with the platform model. The objective of the literature review is not to provide an exhaustive review of the field of various business models but to provide a foundation for this thesis.

Chapter 3 identifies gaps in the literature, clearly defines the research problem, and presents the theoretical frameworks used to guide the research.

Chapter 4 presents the four essential elements required of any research process and the paradigms for conducting research. The robust methodology presents a multi-method research design, with the reasons for selecting semi-structured interviews, Delphi questionnaires, and data collection, administration, and analysis methods.

Chapter 5 introduces Phase 1 of the research, the Delphi Study, describing the method, procedure, three rounds of the Delphi survey and the findings. A conceptual adoption model (National/ Organisation/Management – NOM – framework) emerges for the data collected. Thematic analysis and causal and effect (*fuzzy DEMATEL*) examine the data.

Chapter 6 presents Phase 2 of the research, involving semi-structured interviews. Descriptions include individual responses and thematic analysis, culminating in the ideal healthcare business model outcomes.

Chapter 7 focuses on broader platform integration/transition issues. The proposal for a new hybrid, symbiotic model follows the principles and goals of the ideal healthcare system.

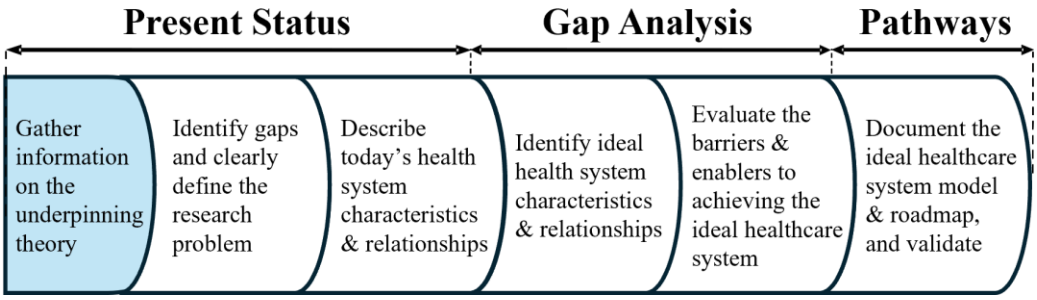
Chapter 8 examines the disparity between the prevailing reality of health outcomes and the ideal model outcomes when delivering improved healthcare.

Chapter 9. This chapter identifies the main implementation barriers and enablers. Following the description of a roadmap for achieving the ideal healthcare system, model validity and generalisability issues are discussed.

Chapter 10 provides a rationale for the ideal healthcare model, including the benefits of a symbiotic network. Following explicit statements concerning original contributions to research and practice, a discussion of research limitations and opportunities follows.

# Chapter 2: Literature Review

## 2.1. Introduction




This section describes the academic foundations for this thesis. Understanding the status of the traditional patient pipeline and associated improvement opportunities requires a comprehensive exploration of the extant literature, encompassing empirical studies, theoretical frameworks, and practical insights. By synthesising knowledge from various disciplines, this review aims to provide a holistic view of current patient journey models, elucidating how they align with or deviate from contemporary healthcare objectives.

The structured literature review adopts a systematic approach to exploring business models and considerations that could improve the traditional patient pipeline model prevailing in New Zealand's public health system. The review follows the guidance for systematic reviews outlined by Xiao and Watson (2019), encompassing empirical studies and theoretical frameworks. Key search terms relating to patient-centred care, healthcare pipelines, platforms, ecosystems, supply chains, healthcare business models, and public health systems were accessed in various databases, including Google Scholar, PubMed, and the University of Waikato online catalogue. Backwards and forward citation tracking helped ensure comprehensive coverage.

Articles were screened for inclusion based on predefined criteria, including relevance to healthcare system transformation and the quality of empirical evidence presented. Studies were evaluated for methodological rigour using a two-tiered process of abstract review followed by full-text evaluation, ensuring high relevance and reliability. The review was iterative, allowing continuous refinement as themes emerged and included quantitative and qualitative studies. This approach provides a robust and holistic foundation for identifying alternative business models that could enhance the efficiency and equity of future healthcare delivery.

First described is the concept of the business model and its value proposition for health delivery. Then, a critique of the pipeline business model and efficacy for delivering healthcare services is followed by the platform business model ecosystem, including the network effects and activity systems involved when providing healthcare services. Also discussed are the associated considerations for decision-makers, which include management of patient demand, pipeline-to-platform transitions that involve digital disruption and transformation, the barriers and enablers to change, change management and associated organisational behaviours.

In a dynamic healthcare landscape like New Zealand, the imperative to transform traditional patient pipelines has emerged as a critical avenue for improving the efficiency, accessibility, and overall quality of healthcare delivery. This literature review explores the multifaceted dimensions of this transformative process, focusing on the status, obstacles, and enablers inherent in reshaping the conventional patient journey. The central thesis, 'transforming the traditional patient pipeline', encapsulates the core inquiry into the current state of patient pathways, the challenges impeding their evolution, and the factors that facilitate positive change.

As contemporary healthcare systems grapple with the ever-evolving needs of diverse and growing populations, re-evaluating traditional patient pipelines becomes imperative. The existing models, characterised by linear and often fragmented processes, hinder the delivery of patient-centred care, impede timely interventions, and contribute to inefficiencies across the healthcare ecosystem. This review endeavours to unravel the intricacies of these pipelines, shedding light on the prevailing structures, their limitations, and the inherent opportunities for enhancement.

The transformation of patient pipelines is not devoid of challenges. Obstacles from technological barriers to systemic resistance can impede the transition towards more adaptive and patient-centric frameworks. Identifying these impediments is crucial for developing targeted interventions and strategic initiatives that navigate the complexities of reshaping entrenched healthcare practices.

Simultaneously, the literature reveals a spectrum of enablers poised to facilitate the transformation of patient pipelines. Technological innovations, organisational adaptability, and patient engagement strategies are potent catalysts for positive change. Unpacking these enablers provides critical insights into the mechanisms that can expedite the evolution of patient journeys, offering a roadmap for healthcare practitioners, policymakers, and researchers alike.

This literature review thus aspires to contribute to the scholarly discourse surrounding healthcare transformation by synthesising existing knowledge, delineating the current landscape, and laying the groundwork for future investigations. Through exploring the status, obstacles, and enablers of transforming traditional patient pipelines, this review endeavours to inform strategic interventions that will shape the future of patient-centric healthcare delivery.

## 2.2. The business model concept

The American Psychological Association (2019) describes a 'model' as a simplified representation or simulation of a real-world system, phenomenon, or concept designed to facilitate understanding, analysis, prediction, or experimentation by capturing key features and relationships while excluding extraneous details. A model replicates reality, a miniature, a life-like definition. Models refer to an abstraction of something that exists. Such models could take the shape of prototypes as a base for replication into life-size, an abstract representation of various scenarios and interdependencies like financial models, a description of a personality as a role model or even fashion models for demonstration purposes. Models abstract from the original. Models help reduce the risk of failure and reduce costs or eliminate rework (Brehmer et al., 2018).

Over the last two decades, the business model has flourished in theory and practice as a concept central to an organisation's survival and growth (Ritter & Lettl, 2018; Snihur & Zott, 2020). Amit and Zott (2001) note in their well-cited definition that the business model concept is *"the design of transaction content, structure and governance to create value through the exploitation of business opportunities"* (p. 219). Scholars have dedicated considerable attention to business models, focusing on defining the term, determining the dimensions of a business model, and providing detailed explanations of these dimensions or reference models. However, Osterwalder et al. (2005) point out that discussing the relationship between business models and time is rare, especially concerning the dynamic perspective.

According to Osterwalder et al. (2005), a business model is a 'blueprint' for how to run a business. This description correctly expresses that a model is an abstraction that describes a business at the conceptual rather than the operational level. Cavalcante et al. (2011) introduce a business model as an abstraction of the principles supporting the development of the core repeated standard processes necessary for a company to perform its business. They posit that a firm's business model serves two interlinked purposes: to provide some stability for the development of a company's activities and, at the same time, to be flexible enough to allow for change.

Cavalcante et al. (2011) advance the discussion by referring to the dynamic business model, which should be able to demonstrate both static properties (ensuring the smooth running of current activities) and flexible characteristics (agile and receptive to changes). Sosna et al. (2010) take a different approach. They view the business model as a systematic analytical device, partly for evaluation and action (Doganova & Eyquem-Renault, 2009) concerning organisational change in general and partly for addressing innovation activities in particular.

Chesbrough and Rosenbloom (2002) note that successful businesses alter the initial models created during their start-up phases, while Linder and Cantrell (2001) describe four different categories of 'change models' depending on the degree to which a firm's core logic changes, suggesting firms should adopt a very active approach in pursuing business model changes. Cavalcante et al. (2011) suggest four different types of business model change: (1) creation, (2) extension, (3) revision, and (4) termination. Each type of change involves specific challenges and difficulties.

### 2.2.1. Business model creation

Foundational knowledge of the Business Model Concept lifecycle, encompassing their creation, extension, revision, and eventual termination, is crucial for examining how these concepts apply to transforming the traditional patient pipeline within the public healthcare setting.

About Figure 2.1, model creation refers to transitioning from a business idea or 'business ideas' at time 0 into block I. This movement realises the transition of a business idea into a new venture, i.e. getting a new business model up and running. The initial idea for a business model resides in the mind of the entrepreneurial agent, and it will often undergo several modifications before being put into practice. In such situations, there are no relevant previous working practices or repeated standardised processes to draw on before implementing the business model.

Critical processes related to future customers, suppliers, partners, competitors, and others are still ideas or hypotheses of the emerging business model (Harper, 2002). Entrepreneurial agents may face many obstacles, including uncertainty and ambiguity in defining a viable business model (Andries & Debackere, 2007), lack of knowledge about different challenges in areas such as law, technology, marketing and finance (essential components for starting a business), difficulties attracting adequate financial/human resources for the new venture and challenges related to professionalising the administrative processes during initial growth.

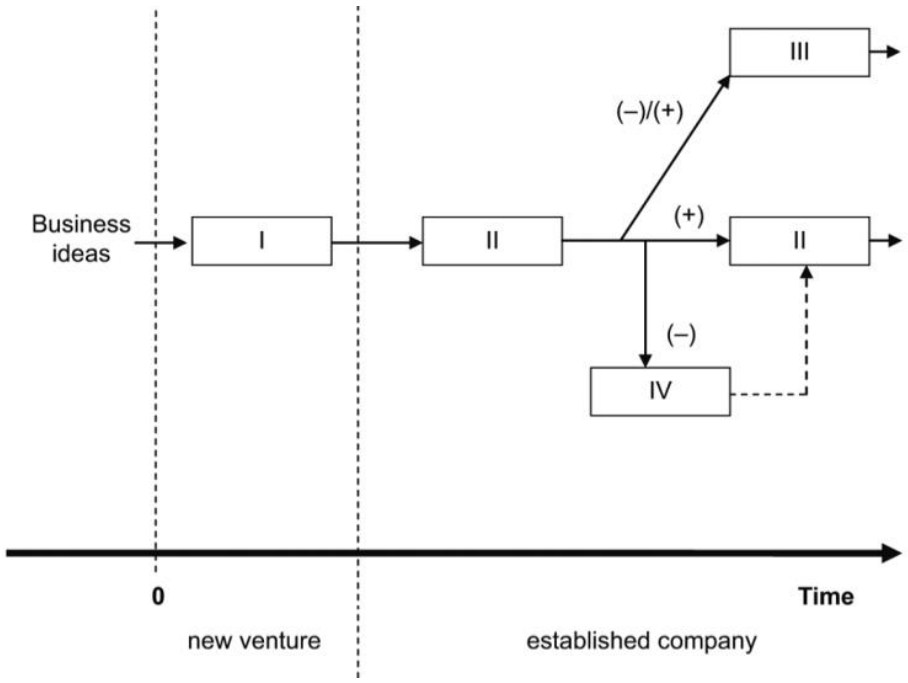



**Figure 2.1. Business model change**

Source: Cavalcante et al. (2011)

### 2.2.2. Business model extension

The model extension adds activities or expands core processes to an existing business model. Figure 2.1 illustrates this by transitioning from one block II to the other. The main characteristic in this phase is the addition of activities, which is illustrated in Figure 2.1 by the sign (+) between two blocks. A critical motivational driver for extension is to explore opportunities for enlarging the existing business and to exploit associated commercial opportunities. At this stage, companies have already defined their core repeated standard processes. Over time, employees and managers become more skilled and familiar with the procedures for executing their tasks.

### 2.2.3. Business model revision

A third type of business model change is revision, illustrated in Figure 2.1 by the transition from block II to block III. Revision means removing something that modifies an existing business model and replacing it with a new process, a feature indicated by the (-)/(+) signs between blocks II and III. Revision implies intervening in the existing process(es), which means following a different direction or exploring alternative business methods. The transition from block II to block III by an arrow that does not follow the expected

direction indicates a change in the company's action. Revision of a business model can be due to different factors and mechanisms, including:

- new commercial opportunities requiring new ways of doing business
- the company's business model is not effective anymore: its products or services do not fit customers' needs and produce suboptimal results, or, as Sosna et al. (2010) argue, the firm's business model faces the threat of obsolescence
- the company's competitors are developing new processes that threaten to capture its share of the market
- new entrant companies that have introduced new ways of meeting existing demands.

While creation implies conceptualising and implementing a new business model, extension implies expanding the business without affecting existing processes within the business model, and revision means that existing working practices are subject to change.

Business model revision will likely involve significantly more challenges than business model extension because it requires fundamental changes. Organisational inertia, i.e. forces constraining companies' ability to make structural changes in response to environmental threats, is one significant difficulty (Hannan & Freeman, 1984; Kelly & Amburgey, 1991). Path dependency is another typical problem that prevents or postpones renewal (in time). While not the focus of this study, David (1985) suggested the notion of path dependency to describe a change process affected by remote, sometimes even chance, events. Since then, a theory of path dependency has grown from a simple idea that 'history matters' to a complex concept, constituting an essential part of the evolutionary view of technological change (Bergek & Onufrey, 2014).

### 2.2.4. Business model termination

The final strategic business model change category is business model termination, illustrated in Figure 2.1 by the transition from block II to block IV. Termination refers to abandoning/removing processes, so block IV is shown outside its expected trajectory. The sign (–) between blocks II and IV indicates the abandonment of processes. Business model termination can refer to closing a business area, business unit, or whole organisation. Some obvious difficulties that may arise during business model termination include resistance from, or indecision on the part of, some of the company's owners.

One of the key findings identified in the study conducted by Cavalcante et al. (2011) is that the business model needs to be flexible. This means that new processes can be added or removed without jeopardising

or seriously altering the current core processes served by the existing business model. However, this is a caveat when an organisation faces a significant impact that involves changes in existing core processes; the business model will be unable to exist in its extant form. Table 2.1 overviews the different business model change types and lists several challenges.

**Table 2.1. Business model change: parameters to consider based on key challenges**

| Change Type | Attributes | Key Challenges |
|---|---|---|
| Business model creation | Creating new processes | Uncertainty and ambiguity |
| | | Failure and inefficiency |
| | | Lack of knowledge or skills |
| | | Lack of resources |
| Business model extension | Adding new processes | Controlled risk |
| | | Resource shortages |
| Business model revision | Changing current processes | Uncertainty and ambiguity |
| | | Lack of knowledge or skills |
| | | Path dependency, inertia |
| | | Blinders, cognitive manifestations |
| | | Resistance |
| Business model termination | Terminating current processes | Resistance |

Source: Cavalcante et al. (2011)

Osterwalder et al. (2005) break down the term *business model* into its components, with the first, 'business' relating to buying and selling goods and services and earning money. The second component, 'model', relates to a representation of something as a simple description of the object used in calculations. This decomposition leads to a simple understanding that a business model represents *how* a company buys and sells goods and services and earns money.

In general, the purpose of creating a model is to help understand, describe, or predict how things work in the real world by exploring a simplified representation of a particular entity or phenomenon. Thus, in the case of a business model, the model (i.e. representation) shall help understand, describe and predict the 'activity of buying and selling goods and services' and 'earning money' of a particular company, i.e. the business model is an abstract representation of the business logic of an organisation. Foss and Saebi (2016) continue this thinking and describe business models as conceptual abstractions, theoretical constructs and constellations of activities dedicated to value creation.

Magretta (2002) asserts that a business model is like a story that explains how an enterprise works. Osterwalder and Pigneur (2010) mainly outline the business model as a representation of the business, where the model diagrammatically represents who the primary customers are and their needs, the value proposition of the business, how the business interacts with customers, how the business organises its operations, the specific resources required for these operations, and the costs and revenue structures of the business. Table 2.2 presents the 'business model canvas' proposed by Osterwalder and Pigneur, which provides a template for logically representing the business model. Here, the business model describes the various choices the firm has made, including its specific customer segments, value offerings, and partnership arrangements, as well as the resultant resource requirements, value flows, and cash flows.

**Table 2.2. Business model canvas**

<table>
<tr><td>KEY PARTNERS</td><td>KEY ACTIVITIES</td><td>VALUE PROPOSITIONS</td><td>CUSTOMER RELATIONSHIPS</td><td>CUSTOMER SEGMENTS</td></tr>
<tr><td rowspan="3">Who are our key partners?<br>Who are our key suppliers?<br>What essential resources do we acquire from our partners?<br>Which key activities do our partners perform?</td><td>What key activities do our value propositions require?<br>Our distribution channels?<br>Customer relationships?<br>Revenue Streams?</td><td rowspan="3">What value do we deliver to our customers?<br>What problems are we helping to solve?<br>What bundles of products and services do we offer each segment?<br>Which customer needs are we satisfying?<br>What is the minimum viable product or service?</td><td>How do we get, keep and grow our customers?<br>Which customer relationships have we established?<br>How do they integrate with the rest of our business model?<br>How costly are they?</td><td rowspan="3">For whom are we creating value?<br>Who are our most important customers?<br>What do our model customers look like?</td></tr>
<tr><td>KEY RESOURCES</td><td>CHANNELS</td></tr>
<tr><td>What essential resources does our value proposition require?<br>Our distribution channels?<br>Customer relationships?<br>Revenue streams?</td><td>Through which channels do our customer segments want to be reached?<br>How do other companies reach them?<br>Which ones work best?<br>Which one is the most cost-efficient?<br>How are we integrating them with customer routines?</td></tr>
<tr><td colspan="3">COST STRUCTURE</td><td colspan="2">REVENUE STREAMS</td></tr>
<tr><td colspan="3">What are the most important costs inherent in our business model?<br>Which essential resources are the most expensive?<br>Which key activities are the most expensive?</td><td colspan="2">For what values are our customers willing to pay?<br>For what do they currently pay?<br>What is the revenue model?<br>What are the pricing tactics?</td></tr>
</table>

Source: Osterwalder and Pigneur (2010)

To summarise, a business model succinctly explains how an organisation creates and captures value with transaction partners such as customers and suppliers (von Delft et al., 2019; Zott et al., 2011). On the one hand, the business model identifies transaction partners, establishes the value proposition(s) for each partner, and describes how a focal firm connects to them (Baden-Fuller & Mangematin, 2013).

### 2.2.5. Alternative business models

Transforming New Zealand's highly inefficient public health service into a patient-focused, financially sustainable, and equitable one will likely require a new, blue-sky approach given the past failures of multiple ineffective improvement initiatives over several decades, including:

- 'Productive Operating Theatre' – where theatre teams aim to work more effectively together to improve the quality of patient experience, the safety and outcomes of surgical services, and the effective use of theatre time and staff experience.
- 'Care Capacity Demand Management' – a set of tools and processes that help hospitals better match the capacity to care with patient demand. The goal is quality patient care, a quality work environment and the best use of health resources.
- 'Releasing Time to Care'—underpinned by a standard Lean methodology, this initiative aims to help staff spend less time on tasks that do not add value, more time with patients, safer, better-quality care, and lower costs.
- 'Patient Flow' provides tools to help staff minimise delays in patients moving through care and accessing the proper care at the right time and place.

Consequently, this section introduces several innovative and non-traditional approaches that challenge conventional paradigms in healthcare. By comparing the alternatives, the aim is to uncover new opportunities for overcoming barriers and leveraging enablers to enhance patient care and operational efficiency in public healthcare settings.

Table 2.3 presents a selection of alternate private-sector business models for delivering patient-centred care that arose from the structured literature review. While the private health sector, which already uses various business models to compete, may help provide the solution, a new (transformational rather than evolutionary) approach may be needed (LaPointe, 2018). According to the PwC Health Research Institute (PwC, 2018), hospitals cannot survive by fine-tuning their business models. Some hospitals will become "Product Leaders," delivering the most advanced care. Some will become "Experience Leaders," known for exceptional customer satisfaction and loyalty. Others will become "Integrators," emphasising value in

a vast scale and scope system. Still others will specialise as “Health Managers,” focusing on specific populations. The envisioned transformation toward a system that prioritises patient needs, assures financial viability and promotes equity necessitates exploration of such business model alternatives, and the table highlights the potential impacts of each business model on the desirable characteristics of equitable access, patient-centred care, integration, and shared resources within public healthcare settings.

This table is a foundation for further exploring each model's unique attributes and practical applications. In the following sections, detailed descriptions of each business model include their specific mechanisms and real-world applications in public healthcare contexts. This analysis elucidates how the models address the urgent challenges and opportunities identified, offering a nuanced understanding of their potential suitability and effectiveness in transforming the traditional patient pipeline.

**Table 2.3. Business models considered**

| | Equitable Access | Patient-Centred Care | Integration | Shared Resources | Pressing Issues Addressed | Evolutionary Approach |
|---|---|---|---|---|---|---|
| **1. Value-based Care** | Medium<br>Digital platforms connect remote areas | High<br>Focus on patient outcomes | Medium<br>Requires coordination, but not inherent | Medium<br>Incentives can drive resource-sharing | Improves health outcomes and cost efficiency | Evolves with payment reforms and policy changes; can be integrated into other models but may not inherently address access or integration thoroughly |
| **2. Public-private partnerships** | Medium<br>Depends on partnership agreements | Medium<br>Can improve with private sector support | Medium<br>Integration varies by partnership | Medium<br>Resource sharing depends on agreements | Addresses resource constraints, brings in private sector expertise | Evolves based on policy and economic environment; effectiveness is highly variable and heavily dependent on the nature of the partnerships |
| **3. Health Tech Innovations** | Medium<br>Tech access varies by region | High<br>Advanced tech offers personalised care | Medium<br>Integration of tech into systems needed | Medium<br>Resource sharing is possible via tech | Enhances diagnostics, patient engagement, and operational efficiency | Rapidly evolving with technology advancements, it requires robust infrastructure and training to ensure |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | equitable access and full integration |
| **4. Product Leader** | Low<br>High-quality products may not be accessible to all | Medium<br>Focus on product quality rather than holistic care | Low<br>Integration is not a primary focus | Low<br>Limited focus on resource-sharing | Focuses on product innovation and quality but may not address broader healthcare system needs | Evolves through continuous product development and innovation but may not address systemic issues in healthcare |
| **5. Experience Leader** | Medium<br>Experience can vary widely by provider | High<br>Focus on enhancing patient experiences | Medium<br>Integration depends on service design | Medium<br>Resource sharing is dependent on the service model | It improves patient satisfaction and care quality but may not ensure equitable access or systemic integration | Evolves with a focus on improving service quality and patient experience, but integration and access can vary widely |
| **6. Integrator** | Medium<br>Integration enhances access indirectly | Medium<br>Focus on seamless service delivery | High<br>Central to the model | Medium<br>Resource sharing within integrated systems | Provides comprehensive care and continuity, but may not directly address access issues or broader systemic resource sharing | Evolves with advancements in coordination and service integration, but may need additional frameworks to address access and equity |
| **7. Health Manager** | Medium | Medium | Medium | Medium | Enhances chronic disease management | It evolves with preventive care |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Preventive care can improve access | Focus on managing outcomes | Integration of preventive services | Resource sharing through preventive programs | and preventive care but may not address direct access issues | practices and chronic disease management advancements, but integration and access issues may persist. |
| **8. Lean** | Low<br>Efficiency gains do not directly address access | Medium<br>Focus on improving processes | Medium<br>Improvements can enhance the integration | Medium<br>Efficiency can lead to better resource use | Enhances operational efficiency and reduces waste, but may not directly address access or patient-centred care issues | Evolves through continuous process improvement and waste reduction, but may need approaches for patient-centred care and access |
| **9. Platform-enabled ecosystem** | High<br>Digital platforms connect areas | High<br>Personalised health data and services | High<br>Seamless integration across services | High<br>Shared electronic health records and tools | Overcomes geographical barriers, enhances personalised care, supports continuity and collaboration in care delivery | Digital platforms evolve rapidly, are easily scalable, and incorporate cutting-edge tech (AI, telemedicine), enhancing all aspects of healthcare. |

Source: The Author

**1. Value-Based Care**

**Description:** Value-based care focuses on delivering care that maximises patient health outcomes relative to the cost of care. It incentivises healthcare providers based on patient health results rather than the volume of services provided.

**Application in Public Healthcare:** Implementing value-based care in public healthcare involves shifting the focus from volume to value. Public health policies reward healthcare providers for improving patient health outcomes and reducing healthcare costs overall (Porter & Lee, 2013).

**2. Public-Private Partnerships (PPPs)**

**Description:** Public-private partnerships involve collaboration between public-sector entities and private-sector companies to deliver healthcare services. These partnerships aim to leverage the strengths of both sectors.

**Application in Public Healthcare:** PPPs can be instrumental in addressing resource constraints and improving service delivery in public healthcare. By partnering with private companies, public healthcare institutions access advanced technologies, infrastructure, and expertise (Babacan, 2020).

**3. Health Tech Innovations**

**Description:** Health Tech Innovations uses advanced technologies, such as telemedicine, wearable devices, and AI, to improve healthcare delivery and patient outcomes.

**Application in Public Healthcare:** Public healthcare can harness health technology to enhance access to care, improve diagnostic accuracy, and streamline administrative processes. Implementing telehealth services and AI-driven diagnostic tools benefits patient care significantly in public healthcare settings (Topol, 2015).

**4. Product Leader**

**Description:** The Product Leader model focuses on offering superior products that stand out in the market due to their quality, innovation, or uniqueness (Shahzad et al., 2013). Companies adopting this model invest heavily in research and development to maintain a competitive edge. A product leader creates successful teams in a product-inspired culture to establish product processes, manage budgets, identify go-to-market

operations, develop product-oriented projects, and act as contact points between senior leadership and product developers (Shahzad).

**Application in Public Healthcare:** In the public healthcare setting, this model focuses on developing cutting-edge medical technologies and pharmaceuticals that address the population's unique needs. Public health institutions collaborate with private sector firms to bring innovative treatments and medical devices to market, enhancing the quality of care provided to patients (Christensen et al., 2009).

**5. Experience Leader**

**Description:** The Experience Leader model prioritises exceptional patient experiences by offering high-quality, personalised care (Pine & Gilmore, 1998). The approach emphasises patient satisfaction and holistic care over cost.

**Application in Public Healthcare:** Public healthcare institutions can adopt this model by improving patient interactions, such as making appointments and ensuring patient-centred services. Training healthcare professionals in communication and empathy and continually implementing feedback systems to improve patient satisfaction are integral to this model (Berry & Bendapudi, 2007).

**6. Integrator**

**Description:** The Integrator business model involves a company taking control over most, if not all, aspects of the supply chain, including participating in various stages of the production process, such as sourcing raw materials and managing distribution (Porter, 2008). It focuses on providing seamless, integrated care across different services and specialties and aims to offer a comprehensive solution that covers all aspects of patient care.

**Application in Public Healthcare:** In a healthcare context, this involves controlling every aspect of healthcare delivery, from medical supplies procurement to patient care and follow-up. Public healthcare systems can benefit from this model by integrating various healthcare services, ensuring continuity of care for patients. This process involves creating multi-disciplinary teams and care pathways that follow patients through the different stages of treatment and recovery (Shortell et al., 1994).

**7. Health Manager**

**Description:** The Health Manager model focuses on managing patient health outcomes through preventive care and chronic disease management. It aims to reduce the incidence of illness through proactive measures.

**Application in Public Healthcare:** Public healthcare can adopt this model by emphasising preventive care programs and chronic disease management initiatives. Implementing community health programs and employing health managers to monitor and guide patient health improves public health outcomes overall (Nolte & McKee, 2008).

**8. Lean**

**Description:** The Lean model emphasises efficiency and eliminating waste in healthcare processes. It aims to streamline operations to improve service delivery, reduce costs, and maximise business efficiency (Womack & Jones, 1997).

**Application in Public Healthcare:** Public healthcare systems can adopt Lean principles to optimise resource use, reduce wait times, and improve patient care processes. Lean involves continuous improvement initiatives and staff training in Lean methodologies (Graban, 2018) aimed at streamlining processes, reducing waste and improving patient care, for example, by reducing unnecessary tests or enhancing patient scheduling efficiency.

**9. Platform-Enabled Ecosystems**

**Description:** Platform-enabled Ecosystems leverage digital platforms to create a network of interconnected healthcare services, facilitating collaboration and data exchange between two or more interdependent groups, usually consumers and producers or service providers (Parker et al., 2016). Collaboration and data sharing are enhanced, and a more coordinated approach to patient care is assured (Tiwana, 2014).

**Application in Public Healthcare:** Public healthcare can benefit from Platform-enabled Ecosystems by integrating healthcare services and providers into a unified digital solution, which could involve creating one or more digital platforms that connect patients with healthcare providers, healthcare providers with healthcare providers, or even patients with other patients for community support.

Overall, the Platform-Enabled Ecosystems model stands out in Table 2.3 as the one with the most potential to *transform* the *entire* public healthcare setting when judged across all the desirable criteria of equitable access, patient-centred care, integration, and shared resources:

1. **Equitable Access:** Platforms can facilitate widespread access to healthcare services by connecting patients with providers regardless of geographical barriers. Telemedicine and virtual health consultations can reach underserved and remote populations, ensuring everyone can access quality care (Cusumano et al., 2019).
2. **Patient-Centred Care:** Digital platforms can provide personalised health information, patient education, and tailored treatment plans. Patients can have greater control over their health data, appointment scheduling, and access to health resources, making care more responsive to individual needs (Tiwana, 2014).
3. **Integration:** Platforms can seamlessly integrate various healthcare services, enabling better coordination between primary care, specialists, and ancillary services. This integration supports comprehensive care pathways and ensures continuity of care for patients (Cusumano et al., 2019).
4. **Shared Resources:** A platform ecosystem allows for the sharing of medical records, diagnostic tools, and other resources across different healthcare providers, which reduces redundancy, improves efficiency, and enhances collaborative care efforts (Tiwana, 2014).

A unified digital platform could connect hospitals, clinics, community health centres, and individual practitioners within a public healthcare *system*. Such a platform would enable:

- **Centralised Health Records:** Secure, centralised electronic health records accessible by authorised healthcare providers.
- **Telehealth Services:** Virtual consultations and follow-ups, reducing the need for in-person visits and expanding reach.
- **Resource Sharing:** Shared diagnostic tools, treatment protocols, and healthcare management software.
- **Data Analytics:** AI and data analytics predict health trends, manage population health, and personalise patient care (Cusumano et al., 2019; Tiwana, 2014).

Models with less potential to transform the entire public healthcare setting when judged across all the desirable criteria in Table 2.3 are:

- **Value-Based Care**

**Rationale for exclusion:** While value-based care focuses on improving patient outcomes and reducing costs, it does not inherently address equitable access. The integration is possible but not inherent to the model, and resource sharing depends on how incentives are structured.

**Issues Not Addressed:** Underserved populations might miss out, and seamless integration or extensive resource sharing is not guaranteed.

- **Public-Private Partnerships (PPPs):**

**Rationale for exclusion:** PPPs can bring much-needed resources and expertise to public healthcare but are highly variable in their effectiveness. Their success depends on the specifics of each partnership, and they may not inherently promote integration or equitable access.

**Issues Not Addressed:** Inconsistent integration and resource sharing and potential neglect of equitable access depending on the nature of the partnership agreements.

- **Health Tech Innovations:**

**Rationale for exclusion:** Health tech innovations can significantly improve patient-centred care and operational efficiency, but they require robust infrastructure, which may not be uniformly available. The integration and equitable access depend on the technology's implementation and reach.

**Issues Not Addressed:** Variability in tech access across regions, potential integration challenges with existing systems, and the need for significant investment and training.

In summary, the Platform-Enabled Ecosystems model aligns best with the goals of equitable access, patient-centred care, integration, and shared resources. By leveraging digital technology and fostering connectivity among various healthcare stakeholders, this model can significantly enhance the effectiveness and efficiency of public healthcare systems, ultimately improving patient outcomes and health equity.

Having explored various business model alternatives, including their strengths, limitations, and potential applications within the public healthcare setting, it becomes essential to understand how they translate into tangible value for patients and healthcare providers.

## 2.3. The value proposition concept

This section delves into the value proposition, examining how the business models can create, deliver, and capture value within a healthcare ecosystem. The concept of the value proposition originates from the work of McKinsey consultants Lanning and Michaels (1988), who defined it as a 'clear, simple statement of the benefits, both tangible and intangible, that the company will provide, along with the approximate price it will charge each customer'.

The concept was developed not as a freestanding idea but in the context of a framework for strategy: the value delivery system (Lanning, 2019). Although research in this area has progressively increased, the value proposition concept has received little attention compared to the substantial literature on customer value. Some scholars identify its potential as "the firm's most important single organising principle" (Webster, 2002, p. 61), crucial to the value creation process (Payne & Frow, 2005), and a statement of the organisation's core strategy (Lehmann & Winer, 2008).

Ballantyne et al. (2011) assert three commonalities regarding understanding value propositions: offerings to the market, their inherent value delivered to the customer by the organisation, and their construction without direct customer involvement. Nevertheless, they may sometimes be co-created within a network of providers. Bititci et al. (2004, p. 259) propose that value propositions are determined "by a meta-level management process of the entire extended enterprise to achieve strategic and operational synergy."

Lindic and Marques da Silva (2011) discuss assessing an organisation's value proposition using:

**Value = Benefits minus Costs**

The value proposition comprises capability, impact (customer benefits), and costs (customer trade-off). Payne et al. (2020) developed the conceptual framework presented in Figure 2.2 for Value Proposition development, which addresses the gap between the component processed and the underlying value proposition.

The components are interactively linked, as illustrated by the connecting arrows that emphasise strategy and implementation issues. Because the model describes purposefully co-created value propositions, contemporary theoretical perspectives from co-creation, business models, encounters, organisational learning, and service systems inform this framework.

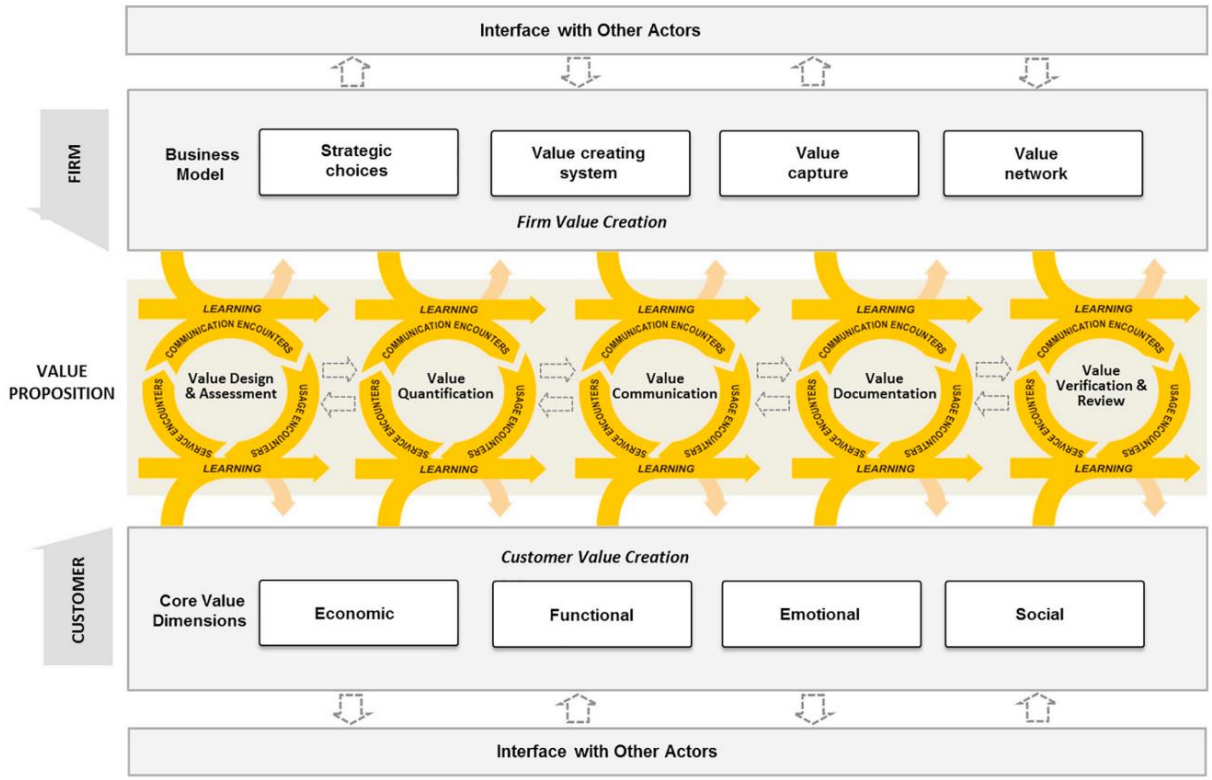



**Figure 2.2. The customer value proposition: a conceptual framework.**

Source: Payne et al. (2020)

There are four parts: (1) the business model and firm value co-creation, (2) the core value dimensions and customer value co-creation, (3) a process of co-creative value proposition development, including reciprocal learning, and (4) an interface with other actors within the firm's ecosystem.

This framework represents a departure from extant approaches to developing value propositions in three key aspects. First, it provides a more detailed recognition of critical strategic factors relating to the firm's business model, including strategic choices, a value-creating system, the value network in which the firm exists, and the potential for value capture. Second, it recognises the nature of co-creative practices, some of which occur in the firm sphere, some in the customer's own, and some in a joint sphere (Grönroos & Voima, 2013). Third, it acknowledges that value proposition implementation requires an integrated approach involving five interactive phases. Specific to this framework is where the focus shifts from internally driven processes for developing the value proposition to an interactive sequence of value design and assessment, quantification, communication, documentation, and verification.

Linking the business model with value co-creation is presented in the upper part of Figure 2.2, which describes how a firm addresses the value offered to customers and captures economic profits (Day, 2011).

Chesbrough (2010) identifies critical components of a business model as being competitive strategy, value proposition articulation, market segments, value chain structure and requisite assets, cost structure and profit potential and the value network, and Jensen (2013) suggests there is now some alignment in the definition of a business model. Referring to the conceptual framework presented in Figure 2.2, Payne et al. (2020) identify four business model elements: strategic choices (competitive strategy, value chain structure, value focus, and customer segment emphasis), value-creating system (resources, capabilities, processes), value capture (revenue model and cost model), and value network (strategically important actor relationships). These business model elements collectively form the strategic basis for identifying customer segments to target and the value requirements of the segments.

Customer value creation, emphasising customers' core value dimensions, is presented in the lower section of Figure 2.2. Customer value creation occurs throughout the customer journey; hence, it is not just manifested as value in exchange. Further, value creation is a dynamic process that is experienced pre-exchange (during the process of searching, evaluating, anticipating and deciding), during exchange (including the process of interacting), post-exchange (involving 'use value'), and potentially, during disposal. Different forms of value are evident at the various stages of the customer journey. Payne et al. (2020) posit that scholars generally agree that value is a multi-dimensional construct, although there is a lack of consensus about the precise number or nature. A key focus of their study is to review research on value dimensions by de Ruyter et al. (1998), Holbrook (2006), Müller (2012), Rintamaki et al. (2007), Sheth et al. (1991), Smith and Colgate (2007), and Sweeney and Soutar (2001). In five of the seven studies, there is broad agreement on the four 'core customer value dimensions' presented in Figure 2.2: functional value, economic value, emotional value, and social value.

Amit and Zott (2010) link the discussion on value proposition back to the business model, defined as the content, structure, and governance of activities between the focal firm and its transaction partners. The business model, therefore, refers to the overall gestalt of interlinked boundary-spanning transactions and activities that enable value creation and capture (Amit & Zott). Thus, as a cornerstone of modern society, the healthcare industry is deeply entwined with intricate business models and the noble mission of delivering vital services to individuals and communities. The value proposition, a central concept in this multifaceted realm, emanates from two distinct yet inextricably linked perspectives: the business model and healthcare delivery (Payne et al., 2020).

### 2.3.1. Business model value proposition

Articulating a clear and compelling value proposition for healthcare that supports the transformation of the traditional patient pipeline involves focusing on crucial aspects like improved health outcomes, enhanced patient experiences, operational efficiencies, and economic sustainability. Within the healthcare business model, the value proposition assumes a strategic role, guiding the organisation's efforts in delivering healthcare services, optimising resource allocation, and shaping its competitive edge. Several critical dimensions of the value proposition are discernible within this context.

**Cost Efficiency:** A fundamental component of the business model's value proposition, cost efficiency, underscores the imperative to optimise financial resources as healthcare organisations endeavour to streamline operations, eliminate waste, and employ innovative technologies to reduce costs (Porter, 2010). Patients are attracted to affordable care while enticing partnerships with insurance providers, fostering a competitive advantage.

**Quality of Care:** Quality emerges as a linchpin of the healthcare business model's value proposition (Berwick et al., 2008). Patients actively seek excellence in medical care, making organisations that consistently deliver superior outcomes, patient satisfaction, and stringent safety measures highly desirable. High-quality care draws patients and cultivates positive patient experiences, nurturing the invaluable currency of word-of-mouth referrals.

**Accessibility and Convenience:** The modern healthcare landscape prizes accessibility and convenience, elevating these attributes to a compelling value proposition. The advent of telemedicine has extended operational hours, and user-friendly digital platforms have ushered in a new era of healthcare accessibility and convenience (Gochhait et al., 2020). These innovations cater to patients seeking flexibility and convenience in their healthcare interactions, aligning seamlessly with their busy lives.

**Innovation and Technology:** Another pivotal dimension of the business model's value proposition lies in its embrace of innovation and technology (Wang & Hajli, 2017). Healthcare organisations that champion cutting-edge treatments, digital health records, AI-driven diagnostics, and wearable health devices position themselves as vanguards of progress. The adoption of such technologies not only augments patient outcomes but also differentiates organisations within the highly competitive healthcare landscape.

**Financial Sustainability:** Healthcare organisations' financial sustainability is a cornerstone of their value proposition. Investors and stakeholders keenly scrutinise their economic stability (Kaplan & Porter, 2011),

recognising that it underpins the ability to deliver consistent, high-quality care. A robust financial foundation ensures future growth, expansion, and investment in research and development, enhancing the organisation's overall value proposition.

### 2.3.2. Healthcare delivery value proposition

The healthcare landscape is undergoing a profound transformation driven by various factors, including advances in medical technology, changing demographics, rising healthcare costs, and evolving patient expectations. In this healthcare reform and innovation era, the ‘value proposition’ concept has emerged as a critical framework for evaluating and enhancing healthcare delivery. The value proposition in healthcare represents a fundamental shift in focus from the quantity of care delivered to the quality of care and outcomes achieved, all while considering the cost-effectiveness of healthcare services.

Historically, healthcare systems often operated under a fee-for-service model, with healthcare providers reimbursed based on the volume of services they delivered. This model led to a focus on the number of procedures performed and tests administered, sometimes at the expense of patient outcomes and cost efficiency. However, the value-based care movement has challenged this traditional approach by emphasising value over volume.

From the healthcare delivery perspective, the value proposition takes on a different dimension, one intrinsically intertwined with the mission to improve health outcomes, enhance patient satisfaction, and nurture the well-being of communities.

**Improved Health Outcomes:** The quintessential essence of healthcare delivery's value proposition is improving health outcomes. Effective treatments, preventive care, and patient education constitute the linchpin of this proposition (Berwick et al., 2008). They collectively usher in an era of improved health, extended life expectancy, and an elevated quality of life for individuals and populations alike. Ultimately, healthcare organisations' impact is their ability to catalyse these positive transformations.

**Patient-Centred Care:** A paradigm shift towards patient-centred care has indelibly reshaped the healthcare landscape (Epstein & Street, 2011). This dimension of the value proposition places the individual at the epicentre, valuing their unique needs and preferences. Healthcare organisations embracing patient-centred care facilitate shared decision-making, enhance communication, and deliver a personalised healthcare experience that kindles heightened patient satisfaction and unwavering adherence to treatment regimens.

**Continuity of Care:** Continuity of care is an essential value proposition within healthcare delivery (Haggerty et al., 2003) and a linchpin that ensures patients receive seamless, well-coordinated healthcare services across diverse providers and settings. This proposition is instrumental in reducing medical errors, elevating patient satisfaction, and fostering the long-term management of chronic conditions.

**Cost-Effective Care:** Healthcare systems that judiciously allocate resources, focus on preventive measures and eschew unnecessary tests and treatments exemplify this value proposition (Bodenheimer & Pham, 2010). By controlling costs while upholding the tenets of high-quality care, these systems make healthcare more accessible and sustainable and benefit patients and payers.

**Community Health and Well-being:** Healthcare organisations, far from operating in isolation, are deeply enmeshed in the fabric of their communities (Kaplan et al., 2014). Engaging in community outreach, preventive programs, and public health initiatives is a value proposition that transcends individual patient care. It symbolises an institutional commitment to broader societal responsibilities and a genuine dedication to enhancing the health of entire communities.

The healthcare value proposition is like a rich tapestry woven with various threads (Porter, 2010). These threads originate from business and healthcare delivery viewpoints, each adding a unique element to the intricate story of healthcare's societal role. The harmonious interplay between these viewpoints is akin to a complex dance, vital for developing sustainable, patient-focused healthcare systems that can adapt to the dynamic needs of communities. A well-crafted and efficiently implemented value proposition in this complex waltz is the pivot, helping healthcare organisations balance their financial sustainability, care delivery, and societal improvement. Ultimately, it encapsulates the core of healthcare, ensuring patients get the care they need while enhancing the overall health of communities.

In formulating an impactful value proposition, healthcare providers strive to create a lucid and convincing narrative highlighting the unique advantages and solutions they provide to patients and stakeholders. This strategic expression of value carves out their competitive advantage and paves the way for a strong patient flow. A compelling value proposition piques initial interest and fosters trust and engagement with prospective patients (Porter, 2010).

In 2006, Porter and Teisberg's book, *Redefining Health Care: Creating Value-Based Competition on Results*, helped to catalyse the move toward a Value-Based Healthcare (VBHC) system, which has become a hot topic in the healthcare sector. Subsequently, many organisations are struggling with where to start and how to make the value of healthcare even more transparent. Porter and Lee (2013) explore the concept of

innovation diffusion networks and express patient value as patient-relevant outcomes divided by the costs per patient across the entire care cycle to achieve these outcomes. Hence, Value-Based Healthcare focuses on maximising the value of care for patients and reducing healthcare costs, as presented in Figure 2.3.

$$\text{Patient Value} = \frac{\text{Patient-relevant } \mathbf{outcomes}}{\mathbf{Costs} \text{ per patient to achieve these outcomes}}$$

**Figure 2.3. Patient value**

Source: Porter and Lee (2013)

Porter and Lee (2013) promote the strategic agenda for moving to a high-value healthcare delivery system with six interdependent and mutually reinforcing components. Hence, progress is most significant when multiple elements are advanced. Figure 2.4 presents the six critical components of Porter's value-based system:

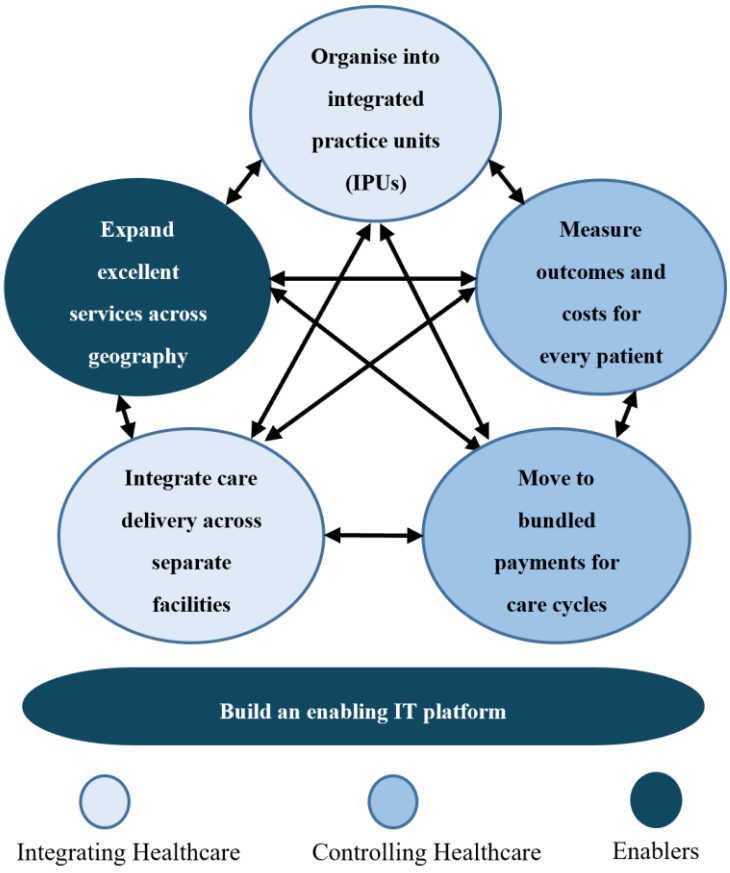



**Figure 2.4. The value-based system**

Source: Porter and Lee (2013)

1. *Organise into Integrated Practice Units*: To establish Integrated Practice Units (IPUs) in healthcare necessitates a departure from the prevailing siloed divisional structures organised by specialty and discrete services towards a model centred on the patient's medical condition. This restructuring entails forming integrated practice units wherein a specialised team comprising clinical and nonclinical staff assumes responsibility for managing the entire care continuum of the patient's condition.
2. *Measure outcomes and costs for every patient*: Outcomes should be assessed based on medical conditions like diabetes rather than focusing on medical specialties such as podiatry or interventions like eye examinations. These outcomes should encompass the entire care cycle for the condition and monitor the patient's health status post-treatment. Patient-centric outcomes for a specific medical condition can be in three tiers:

    - *Tier 1* pertains to the attained health status. While mortality rates are crucial, patients are equally concerned about their functional well-being. For instance, in prostate cancer treatment, where five-year survival rates often exceed 90%, patients prioritise functional outcomes like incontinence and sexual function due to significant variability among providers.
    - *Tier 2* outcomes concern the care cycle and recovery process. High readmission rates and frequent emergency department visits, though not necessarily affecting long-term survival, incur expenses and frustration for patients and providers. Patients value minimal discomfort during care and prompt return to normal activities, while delays in specialist consultations or treatment initiation heighten anxiety and prolong recovery.
    - *Tier 3* outcomes focus on health sustainability. A two-year-lasting hip replacement is inferior to one lasting 15 years, considering both patient and provider perspectives. Comprehensive outcome measurement is essential for meeting patient needs and reducing healthcare costs. Improvements in Tier 1 functional outcomes consistently correlate with cost reductions. Similarly, enhancements in Tier 2 or 3 outcomes lead to cost savings.
    - Providers must track costs at the medical condition level throughout the care cycle to assess value. Tracking necessitates understanding resource utilisation, including personnel, equipment, facilities, and associated IT and administration support costs. Time-driven activity-based costing (TDABC) offers a robust approach to comprehending these costs, although its adoption in healthcare remains limited. Nevertheless, where implemented, TDABC enables significant cost reductions of 25% or more by optimising capacity utilisation, standardising processes, matching personnel skills to tasks, and selecting cost-effective facilities, among other strategies.

3. *Move to bundled payments for care providers*: The payment approach best aligned with value is a bundled payment that covers the entire care cycle for acute medical conditions, the overall care for chronic conditions for a defined period (usually a year), or primary and preventive care for a defined patient population (healthy children, for instance). Well-designed bundled payments directly encourage teamwork and high-value care. Payment is tied to overall care for a patient with a particular medical condition, aligning with what the team can control. Providers benefit from improved efficiency while maintaining or improving outcomes. Sound bundled payment models should include severity adjustments or eligibility only for qualifying patients; care guarantees that hold the provider responsible for avoidable complications, such as infections after surgery; stop-loss provisions that mitigate the risk of unusually high-cost events; and mandatory outcomes reporting.
4. *Integrated care delivery across separate facilities*: To genuinely attain system integration, organisations confront four interconnected sets of decisions: delineating the extent of services, consolidating service provision in fewer sites, selecting optimal locations for each service category, and harmonising patient care across various sites. The challenges associated with redistributing care are considerable, as most providers are inclined to maintain the existing situation and safeguard their domains. Assessing the readiness of board members and leaders within the health system for transformation involves posing critical inquiries, such as preparedness to relinquish service lines to enhance the quality of patient care. Is the relocation of service lines under consideration?
5. *Expand excellent services across geography*: Geographic expansion manifests in two primary forms. Firstly, the hub-and-spoke model is adopted, where satellite facilities are established and operated, at least partially, by clinicians and staff employed by the parent organisation for each IPU. In the most productive implementations, selected clinicians rotate among these locations, fostering a sense of team cohesion among staff across all facilities. Expanding into entirely new regions, a new IPU hub is constructed or acquired. Typically, patients undergo their initial evaluation and receive treatment plan development at the hub. At the same time, some of their care administration may occur at more convenient (and cost-effective) satellite locations. Satellites primarily handle less complicated care cases, reserving complex cases for referral to the hub. Patients transfer to the hub for continued care when complications arise beyond the satellite facility's effective management capabilities. Consequently, there is a substantial increase in the number of patients that an exemplary IPU can effectively serve.
6. *Build an enabling Information Technology platform*: A supporting information technology platform enables the above components of the value agenda. Historically, healthcare IT systems have been siloed by department, location, service type, and data type (for instance, images). Often, they complicate rather than support integrated, multidisciplinary care since automating broken service

delivery processes can only result in more efficient broken processes. Conversely, an effective IT system can help tie the various parts of a well-structured delivery system together and enable measurement and new reimbursement approaches. A value-enhancing IT platform comprises six pivotal elements:

i. *Patient-Centric Orientation*: The system revolves around patients, tracking them across services, sites, and time throughout the entire care cycle, including hospitalisation, outpatient visits, testing, physical therapy, and other interventions—data aggregation centres on patients rather than departments, units, or locations.
ii. *Uniform Data Definitions*: Standardisation of terminology and data fields for diagnoses, lab values, treatments, and other care aspects fosters a common language, facilitating data comprehension, exchange, and querying across the entire system.
iii. *Comprehensive Patient Data Integration*: All the data relating to patients, including physician notes, images, chemotherapy orders, and lab tests, are consolidated in a single repository, ensuring a holistic view for all involved in a patient's care, including referring physicians and patients themselves.
iv. *Accessibility and Sharing of Medical Records*: The medical record is accessible to all care stakeholders, thereby breaking down silos and promoting shared information among different clinicians. A fundamental measure of system accessibility is whether visiting nurses can access physicians' notes and vice versa.
v. *Condition-Specific Templates and Expert Systems*: Templates streamline data entry and retrieval, procedure execution, use of standard order sets, and outcome and cost measurement for each medical condition. Expert systems assist clinicians in identifying necessary steps and potential risks, contributing to standardised and informed care.
vi. *Extractability of Information*: Value-enhancing systems enable easy extraction of data required for outcome measurement, patient-centred cost tracking, and adjustment for patient risk factors through natural language processing. These systems empower patients to report outcomes during their care, facilitating better clinical decisions. Even in today’s most advanced systems, the critical capability to create and extract such data remains underdeveloped, and the cost of measuring outcomes and costs is needlessly high.

## 2.4. Patient flow expansion

Porter and Lee (2013) state that value-based system propositions drive patient flow, crucial to growth and delivering high-quality healthcare services for everyone.

### 2.4.1. Equitable access

In healthcare, a fundamental principle stands as a beacon of ethical, moral, and societal imperative—the principle of equitable access to quality healthcare for all (Plianbangchang, 2018). Equitable access to healthcare is not merely a policy objective; it is a deeply rooted value that reflects our shared commitment to the welfare of our fellow citizens and the broader human community (Marmot, 2007). This principle embodies what a just and compassionate healthcare system should strive to achieve—a system that leaves no one behind and extends its healing touch to everyone, irrespective of social status, geographic location, or economic circumstances (Braveman, 2006). It recognises that health is a fundamental human right, not a privilege bestowed upon a fortunate few (Castillo et al., 2017). At its core, equitable access signifies fairness and justice in the distribution of healthcare services (Abatemarco et al., 2019). It affirms that access to healthcare should not be contingent on one's ability to pay, place of residence, or background. Instead, it asserts that healthcare is a universal entitlement, a societal pact to safeguard the health and well-being of every individual (Richard et al., 2016).

Equitable access transcends the notion of mere ‘equality’ in healthcare. While equality implies that everyone receives the same level of care, equity recognises that people have diverse needs (Marmot, 2007). It demands that we allocate resources and services based on the principle of ‘fairness’, which entails distributing healthcare according to individual requirements (Abatemarco et al., 2019). Thus, equitable access customises healthcare to each person's unique circumstances, addressing health disparities and levelling the playing field (Richard et al., 2016).

### 2.4.2. Health equity: the antithesis of disparities

Health disparities represent the unmet promise of equitable access—the divide between the healthcare one should receive and what one obtains (Marmot, 2007). Pursuing equitable access confronts the stark realities of health disparities, which persist within society worldwide (Castillo et al., 2017). These disparities often manifest as differences in health outcomes, life expectancies, and disease burdens among different population groups (Abatemarco et al., 2019). Consider, for instance, the disparities seen in the prevalence

and management of chronic diseases (Shadmi, 2013), the access to prenatal and maternal care (Siva, 2023), or the distribution of life-saving medications (Kersten & Makaryus, 2020).

Health disparities follow the fault lines of socioeconomic status, race, ethnicity, gender, and geographic location, perpetuating cycles of disadvantage and injustice (Braveman, 2006). To truly embrace equitable access, we must confront these disparities head-on, recognising them as systemic challenges that require systemic solutions (Headen et al., 2022).

### 2.4.3. Global imperative and local reality

While the principle of equitable access resonates as a global imperative, it manifests uniquely within the context of each nation's healthcare system. Healthcare systems worldwide grapple with distinct challenges, ranging from resource constraints and workforce shortages to cultural diversity and policy variations. Consequently, achieving equitable access demands a nuanced understanding of local realities, contexts, and priorities (Dhar, 2022).

Within the context of this principle, healthcare leaders and policymakers face a dual challenge: the ethical mandate to provide equitable access and the pragmatic task of tailoring healthcare strategies to their specific contexts. Achieving this balance requires innovative approaches, policy agility, and a relentless commitment to fairness (Dhar, 2022).

## 2.5. The pipeline business model concept

In recent years, the subject of pipeline management has grown as businesses attempt to transcend the digital divide (Bughin et al., 2017). Examining how pipeline businesses that have dominated industries for decades differ from platforms disrupting marketplace competition across many industries is essential (Parker & Van Alstyne, 2014). A traditional pipeline business creates value by controlling a linear series of activities (as per the classic value-chain model). Here, the upstream inputs (materials) at one end of the supply chain undergo a series of value-adding steps that transform them into an output (a finished product) that is worth more (Porter & Millar, 1985; Teece, 2010).

Within the health sector, managing the patient pipeline involves balancing patient demand with provider and infrastructure capacity. The need to match highly fluctuating demand with available capacity (providers, skillsets, equipment, and infrastructure) has long been among the most significant challenges facing senior managers in any service industry (Klassen & Rohleder, 2001; Lovelock, 1992). The healthcare delivery challenge has also increased in complexity due to the convergence of many factors, which has

heightened the need for effective demand- and capacity-management strategies (Adenso-Diaz et al., 2002; Li & Benton, 1996).

Patient pathways may differ considerably according to the circumstances through which patients enter the present pipeline health care system. Figure 2.5 shows a typical patient pathway where the patient entering the pipeline at the top has no medical condition requiring direct involvement of emergency medical services at the primary care level.

### 2.5.1. Pipeline healthcare

Pipelines, characterised by their sequential and stepwise approach, are particularly suited to healthcare scenarios that demand a high degree of standardisation and precision (Van den Hoed et al., 2022).

1. ***Standardisation and Efficiency:*** Pipelines excel when standardised processes and efficiency are paramount (Mock et al., 1998). Standardised protocols and procedures are essential in healthcare, especially where rapid and consistent decision-making is critical (Maleki et al., 2015). For instance, in emergency care, standardised triage protocols ensure that patients are prioritised based on the severity of their conditions (Bullard et al., 2017). This approach promotes equitable access to care by ensuring that those in the most critical condition receive timely treatment. In such cases, the pipeline model streamlines processes and reduces variability and delays, ultimately saving lives (Ramakrishnaiah et al., 2023).
2. ***Customisation for Precision:*** While pipelines are known for their standardised approach (Moullin et al., 2015), they are not devoid of customisation. In healthcare, there are instances where precision and customisation are essential (Minvielle et al., 2021). Here, pipelines can be adapted to cater to the unique needs of individual patients (Moullin). For example, therapeutic pipelines can be customised in cancer treatment based on genetic markers (Choi & Chang, 2023), allowing targeted therapies that maximise efficacy while minimising side effects. This ability to tailor care plans within the pipeline framework ensures a patient-centred approach recognising the uniqueness of each patient's medical history and condition (Constand et al., 2014).
3. ***Modularity for Specialisation:*** Pipelines offer the advantage of modularity, which aligns with situations that require specialisation and expertise (Bartels et al., 2021). Healthcare combines specialised fields and disciplines, from cardiology to radiology (Halm, 2021). In this context, pipelines enable healthcare professionals to focus on specific areas, nurturing depth of knowledge and expertise (Frenk et al., 2010). Specialists within these pipelines can continuously refine their skills and stay abreast of the latest developments in their respective domains (Nakata et al., 2017).

This specialisation improves patient outcomes by ensuring patients receive care from providers with a deep understanding of their medical condition (Mun et al., 2018).

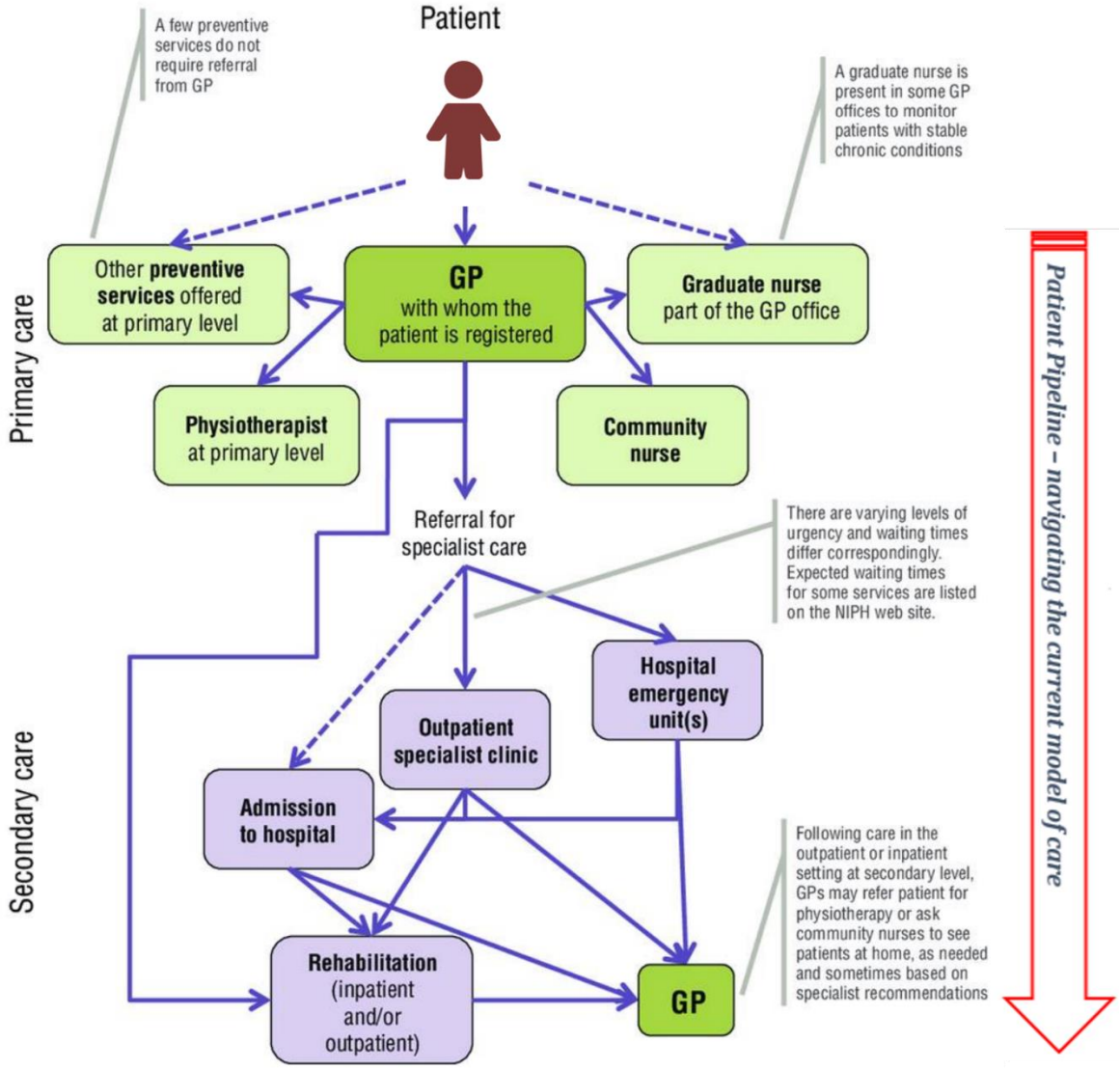



**Figure 2.5. Simplified patient pipeline pathways**

Source: Albreht et al. (2016)

### 2.5.2. Pipeline healthcare strengths and weaknesses

The pipeline healthcare delivery model has long been the cornerstone of healthcare systems worldwide (Frenk et al., 2010). It is a linear, step-by-step approach to patient care, where each stage is distinct and follows a predetermined sequence (Porter & Lee, 2013). While this model has been the foundation of

healthcare delivery for many decades, its suitability for the ideal healthcare model is debatable (Berwick et al., 2008; Bodenheimer & Sinsky, 2014).

***Strengths:***

1. **Equitable Access:** One of the pipeline model's strengths is its ability to provide standardised care pathways. For example, in emergency settings, triage protocols ensure that patients receive care according to the severity of their condition. This approach helps ensure that patients with the greatest need receive care promptly, thus promoting equitable care access (Bullard et al., 2017; Iserson & Maskop, 2007; Kuriyama et al., 2017).
2. **Patient-Centred Care:** While often criticised for its rigidity, the pipeline model's configuration can prioritise specific patient needs. For instance, care plans can be tailored to individual patient histories, ensuring a patient-centred approach (Mead & Bower, 2000). By focusing on individual patient data, healthcare providers can make informed decisions regarding treatment plans, medications, and interventions (Oates et al., 2000; Epstein & Street, 2011).

***Weaknesses:***

1. **Integration Challenges:** A lack of seamless integration is a common feature of the pipeline model. Different specialties or departments within a healthcare system may operate independently, resulting in fragmented care delivery. For example, a patient receiving care for multiple chronic conditions may interact with various specialists, but these specialists may not always communicate effectively, leading to disjointed care (Tinetti & Fried, 2004; Ouwens et al., 2005; Wagner et al., 1996).
2. **Resource Allocation Inefficiencies:** Resource allocation in the pipeline model tends to be static and based on historical patterns, resulting in underutilisation of resources in some areas and overcrowding in others. Such inefficiencies directly contradict the goal of shared resources and can lead to suboptimal patient outcomes (Vissers & Beech, 2005; de Bruin et al., 2010; Anand et al., 2009).

## 2.6. The platform business model concept

In addition to the more usual meaning of the word ‘platform’ as a raised level surface on which people or things can stand, the word has been used in an abstract sense since the 16$^{th}$ century. The Oxford English Dictionary cites examples from as early as 1574 in which ‘platform’ refers to a ‘design, a concept, an idea; (something serving as) a pattern or model (Oxford English Dictionary, n.d.). More recently, management scholars have developed the platform concept in three overlapping waves of research, focused respectively

on products, technological systems, and transactions (Cusumano & Gawer, 2003; Gawer, 2014; Thomas et al., 2014).

Product development researchers first used the term 'platform' to describe projects that carried a new generation or family of products for a particular firm. In their seminal work on product development planning and execution, Wheelwright and Clark (1992) introduced the term "platform product" to describe new products that "meet the needs of a core group of customers but [are designed] for easy modification into derivatives through the addition, substitution, or removal of features" (p. 73; emphasis added). Research also focused on 'platform investments' (Kogut & Kulatilaka, 1994), 'platform technologies' (Kim & Kogut, 1996), and more generally, 'platform thinking' (Sawhney, 1988), along with rich field studies (e.g. Sanderson & Uzumeri, 1995) and managerial advice on platform-oriented product planning (e.g. Meyer & Lehnerd, 1997; Robertson & Ulrich, 1998).

In the second wave, technology strategists identified platforms as valuable points of control (and rent extraction) in an industry. Competition between platforms thus came to be seen as an essential force at the industry level, with the ability to determine both the success and failure of firms and the evolution of product designs. Bresnahan and Greenstein (1999) developed a theory to explain the evolving structure of the computer industry, which remained concentrated around a small number of dominant platforms even as competition intensified within market segments. Influential studies of Microsoft and Netscape illustrated contrasting approaches to market leadership, with Microsoft forming a 'Platforms Group' to consolidate its efforts around the Windows operating system (Cusumano & Selby, 1998), and Netscape adopting a 'cross-platform strategy – in part by creating a new internal platform, the Netscape Portable Runtime, to permit its browser to work with any operating system (Cusumano & Yoffie, 1998).

Although people in different contexts have defined platforms, a common underlying theme is that a platform comprises a stable core component and a set of complementary components (Tushman, 2002). Also, there are interfaces that developers use to make components and that components use to communicate with the core platform (Boudreau, 2010). More simply, Gawer (2011) defines a platform as the building blocks that act as a foundation upon which an array of firms (sometimes called a business ecosystem) can develop complementary products, technologies or services. Parker et al. (2016) introduce value into the mix, where a platform business creates value by managing the direct interactions between several distinct customers.

Cusumano (2010) discusses the essential differences between industry-wide platforms and product platforms. Industry platforms provide a common foundation that an organisation can reuse in different

product variations, like an in-house product platform. Here, the industry platform provides functionality as part of a technology 'system' whose components come from other (complementor) companies. Consequently, industry platforms have relatively little value to users without complementary products or services. Eisenman et al. (2006; 2011) highlight a third essential difference for industry-wide platforms; 'network effects' are effectively demand-side economies of scale, where the value to existing consumers escalates as new consumers adopt the platform. Demand-side network effects are distinct from the supply-side economies of scale, which arise from high fixed and low marginal costs (Parker & Van Alstyne, 2012). Network effects can be observed across 'two-sided' markets when an increase in the number of consumers increases the platform's attractiveness for developers, while more development increases the platform's attractiveness to consumers (Parker & Van Alstyne, 2000; 2005). In a typical platform market, participants exchange value in a triangular relationship where the platform provider extracts rent by charging one side of the market for access rights.

Platforms have been studied in diverse contexts (Thomas et al., 2014). In the economics literature, a platform means two-sided or multi-sided markets where two or more sides with cross-side network externalities can interact (Eisenmann et al., 2006; Rochet & Tirole, 2003). Unlike a linear value chain, both platform sides can incur costs and accumulate revenue. The product/technology innovation literature defines a platform as the core module of a system that outsiders can easily connect to and build upon to expand the system of use (Gawer & Cusumano, 2008; Baldwin & Woodard, 2009). As a core module, a platform not only performs the essential functions of the ecosystem but also establishes its interface rules. This feature also appears in the definition of business economics, which describes a platform as a nexus of rules and architecture that exhibits network effects (Parker et al., 2016). A platform's ecosystem includes the partners that adhere to the rules and competitors that do not. These definitions developed in the economic and product/technology literature fulfil the notion of a platform, as discussed here.

Van Alstyne et al. (2016) describe all platforms as having an ecosystem with the same basic structure and four kinds of players. Platform *owners* control their intellectual property and governance. *Providers* serve as the interface with users. *Producers* create their offerings, and *consumers* use them (Figure 2.6).

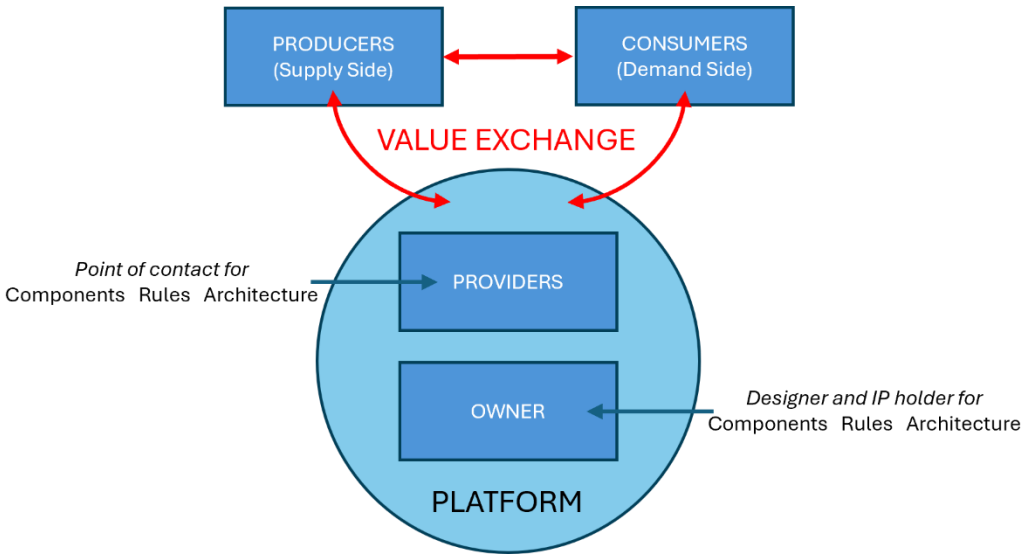



**Figure 2.6. Platform ecosystem**

Source: Adapted from Christensen et al. (2000)

### 2.6.1. Platform ecosystems

As mentioned, a platform model relies on an ecosystem that dynamically connects supply and demand. While this relationship is not an invention, as local markets and shopping malls functioned as physical platforms, the Internet created vast potential for new digital platform types (Hein et al., 2019). Today, digital platform technical infrastructures and their *ecosystems* of social actors continue to change entire industries. For example, Airbnb lists over seven million accommodations and offers listings in more than 220 countries and regions (iPropertyManagement, 2020). Similarly, across Uber, Lyft, Gab and Didi, a network of 28.9 million drivers delivers 49 million rides daily, overshadowing the local taxi companies (Dogtiev, 2020). With over 2.6 billion monthly active users reported in the first quarter of 2020, Facebook is the most extensive social network worldwide (Clement, 2020) and vastly outnumbers newspaper subscriptions.

All digital platforms are built on continually evolving information technology, such as cloud computing, in-memory databases, and analytical solutions for big data (Hein et al., 2019). A platform provides the infrastructure and rules for a marketplace that brings together producers and consumers, where the players in the ecosystem may fill four leading roles but can shift rapidly from one role to another (Constantinides et al., 2018).

Bakos and Katsamakas (2008) contend that platform ownership is essential for the design and governance of digital platform ecosystems because ownership relates to the distribution of power in the ecosystem,

which can be centralised or decentralised. It also describes the relationships between partners in the ecosystem (Tiwana et al., 2010). Hein et al. (2019) categorise platform ecosystem ownership models into the three main archetypes in Figure 2.7. First is the platform formed with a *single owner* that controls the digital platform ecosystem, such as Facebook, the Apple iOS mobile operating system, or the SAP Cloud Platform. With centralised power, the platform owner as a single entity defines, establishes, and maintains its governance mechanisms, enabling the platform owner to implement and adjust governance mechanisms quickly and in a way that is best for ecosystem growth (Satariano et al., 2019).

Secondly, a digital platform ecosystem can be formed by *consortia*, implying that a group of actors owns the digital platform and, thus, establishes the governance mechanisms (Bazarhanova et al., 2019). In contrast with the centralised digital platform ecosystem, consortia ownership implies power distribution over multiple stakeholders. Hence, the owners jointly define, establish, and maintain governance mechanisms for the digital platform ecosystem.

Thirdly, decentralised digital platform ecosystems allow the creation of decentralised ecosystems that peer-to-peer communities can govern. Blockchain platforms like Ethereum or District0x empower users to influence the future direction of the ecosystem directly (Riasanow et al., 2018).

Successful digital platforms facilitate value-creating mechanisms within the platform ecosystem that build on efficient and convenient transaction facilitation (Tiwana, 2014). With the first value-creating mechanism of transactions, digital platforms help complementors and consumers locate and interact with each other and exchange value in a mutually beneficial manner (Evans, 2012).

The digital platform acts as an intermediary by directly *matching supply to demand* and suggesting possible transactions or by providing easy-to-use search functions through which users can find transaction partners (Armstrong, 2006). Via the orchestration of transactions, digital platforms create two-sided markets (Rochet & Tirole, 2003) that leverage cross-side network effects. For example, Airbnb is a digital platform facilitating *transactions* between property owners and people seeking temporary accommodation.

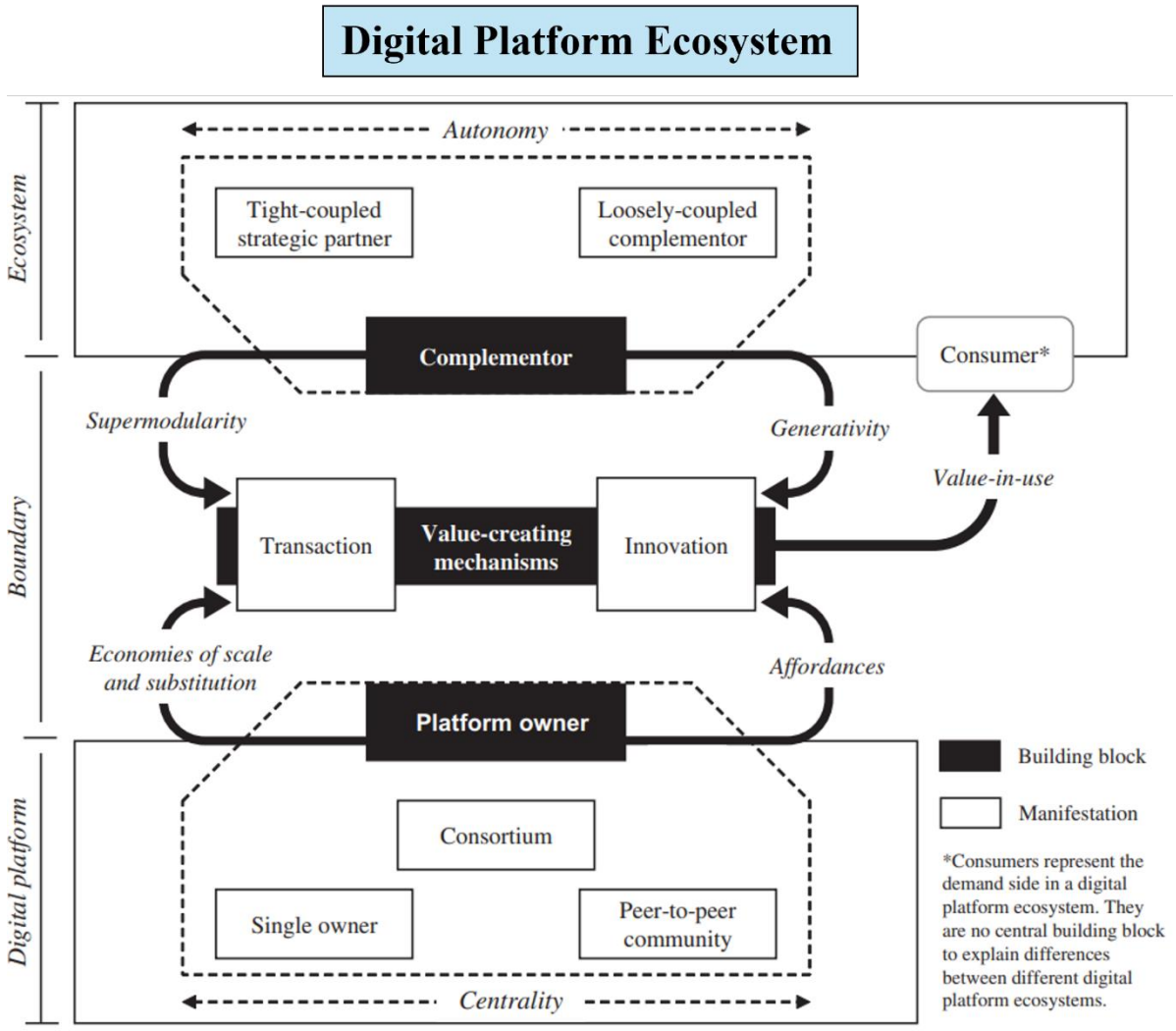



**Figure 2.7. Platform ecosystem building blocks**

Source: Adapted from Hein et al. (2019)

Here, the digital platform helps owners advertise their accommodation and offers finely tuned search functionality for consumers looking for a place to stay. Each new listing utilises economies of scale and substitution and increases the platform's value, making it a super-modular complementarity that induces network effects between supply and demand (Hein et al., 2019). Thus, individuals across the globe who would never have initiated such a transaction come together via the combined value of all the listings on the Airbnb platform (Hartmans, 2017). The basis for this value-creating mechanism is a modular software-based platform, where the platform owner provides value-creating services, such as payment functionalities or recommender systems, to increase the efficiency and convenience of the services for the ecosystem (ibid).

The second value-creating mechanism is due to the innovation capabilities of digital platforms that enable complementors to create solutions as an accompaniment to the platform core (Tiwana, 2014). By offering development tools to complementors, the platform owner provides affordances to co-create value-adding complements (Ghazawneh & Henfridsson, 2013; Nambisan et al., 2019). For example, SAP leverages third-party innovation on its SAP Cloud Platform (Schreieck et al., 2019) via Application Programming Interfaces (APIs) and other resources for complementors to create applications that link to SAP's enterprise resource planning software. The net effect of this provision of affordances is to create a breeding ground for innovation (Yoo et al. 2010).

Complementor autonomy describes the degree of freedom complementors have when they co-create value with a digital platform (Ye & Kankanhalli, 2018). Complementors with high autonomy are loosely coupled to the digital platform and contribute to the variety and number of complements (Boudreau, 2010). In turn, complementors with low autonomy (low power) are tightly coupled to a digital platform and form strategic partnerships that strengthen the core focal-value proposition (Danneels, 2003).

Depending on the degree of autonomy of complementors, the platform owner must cope with varying levels of control, scalability, and flexibility (Parker et al., 2017). High autonomy complementors refer to a loosely coupled relationship in which the complementor is independent and separate from the digital platform (Orton & Weick, 1990). The complementor can either be an actor that actively contributes to the digital platform or another compatible platform that is not engaged actively with the digital platform. An example of the former includes complementors of Airbnb, where homeowners have relatively low entrance barriers and can easily multi-home between different platforms (Lusch & Nambisan 2015). Low autonomy complementors refer to tightly coupled strategic partners in which both the platform owner and the complementor are mutually dependent and aligned (Orton & Weick) and can be individual actors or other platforms. An example of tightly coupled actors is the Open Handheld Alliance (OHA), which promotes and develops the Android operating system to compete against other mobile platforms, such as Apple and Microsoft.

The ecosystem perspective primarily deals with the impact of network effects (Parker et al., 2016; Song et al., 2018) or how the digital platform can energise or constrain the focal-value proposition of an ecosystem (Kapoor, 2018). However, as with the example of Uber (Conger et al., 2019), complementors can also influence the strategic decisions of digital platform ecosystems. The same interdependencies are observed at the ecosystem level when the ecosystem offers development opportunities to platform owners. Taking Uber as an example, Uber first established an efficient infrastructure that orchestrates interactions between drivers and passengers and then recognised that this ecosystem could provide additional services, such as

Uber Eats (Kapoor & Agarwal, 2017). Those interdependencies give rise to novel questions about how the structure of ecosystems can influence the strategic decisions of platform owners.

Platform participants—consumers, producers, and providers—typically create value for a business but may absent themselves on deciding that their needs would be better met elsewhere or compete directly with the platform (Christensen et al., 2000). For example, consumers and producers can swap roles in ways that generate value for the platform. Users can ride with Uber today and drive for it tomorrow; travellers can stay with Airbnb one night and serve as hosts for other customers the next. In contrast, providers on a platform may become depleted, especially if they decide to compete with the owner. For example, as a provider to telecommunication firms' platforms, Netflix controls consumers' interactions with the content it offers to extract value from the platform owners while relying on their infrastructure (Christensen).

### 2.6.2. Platform network effects

The engine of the traditional industrial economy was, and remains, supply-side economies of scale, where massive, fixed costs and low marginal costs mean that firms achieving higher sales volume than their competitors have a lower average cost of doing business (Van Alstyne et al., 2016). That advantage allows them to reduce prices, which increases volume further, which permits more price cuts—a virtuous feedback loop that produces monopolies (Van Alstyne). Conversely, demand-side economies of scale, or network effects, drive the Internet economy. Technologies that create efficiencies in social networking, demand aggregation, app development, and other phenomena that help networks expand all enhance the network effects (Van Alstyne).

In the Internet economy, firms that achieve higher 'volume' than competitors (i.e., attract more platform participants) offer a higher average value per transaction. The more extensive the network, the better the matches between supply and demand and the richer the data for finding a match. Scale generates value, attracting more participants and creating more value—another virtuous feedback loop that produces monopolies. Thus, Alibaba accounts for over 75% of Chinese e-commerce transactions, and Google accounts for 82% of mobile operating systems and 94% of mobile search (Van Alstyne et al., 2016).

A business platform is a nexus of rules and infrastructure that facilitate interactions among network users (Eisenmann et al., 2011), and a networked business platform aims to expand into and operate within a given market (Cusumano & Gawer, 2003). Platforms also match buyers with suppliers, who transact directly with each other using system resources (Hagiu, 2014) and are generally subject to network effects (Boudreau,

2010; Eisenmann et al., 2006). These definitions each have the property that reconfiguration of platform assets allows external parties to interact with each other and add value (Cusumano & Gawer).

Hagiu (2014) identified network platforms as one of three elemental configurations through which organisations generate value. In traditional industries, bilateral exchanges follow a linear path as organisations purchase inputs, transform them to add value, assemble components and subsystems into complete products and then sell the output. In platform industries, interaction follows a triangular relationship (Eisenmann et al., 2006) as parties affiliate with the platform first, then connect or trade using platform resources. For example, on Airbnb, renters and hosts transact with one another. However, they use the platform for search and matching; they enter into contractual agreements, transfer payments, acquire insurance, and manage reputations to facilitate future transactions. Platform firms share characteristics with platform products but operate in these triangular rather than linear markets. Both imply shared technology, reconfigurable elements, and fixed costs spread across multiple product types, such as automobiles with standard engines, transmissions, and electronics (Cusumano & Nobeoka, 1992).

Organisations characterised by a network of value-adding relationships among users over and above the value of physical platform components must devise rules that promote healthy participant interactions to manage and motivate external relations (Hagiu, 2014). A network platform differs from a product platform because of the more substantial network effects, switching costs, and single-homing costs. These factors create increased pressure for market concentration, and organisations choosing to compete in such markets need clear guidelines to set strategies to harness these effects (Parker & Van Alstyne, 2014).

### 2.6.3. Multi-sided platforms

Multi-sided platforms are conceptually different from other organisational forms that involve two or more transaction partners. Prior literature characterises multi-sided platforms as hubs or intermediaries for value exchanges between two or more markets of users and producers (Gawer, 2014; Hagiu & Wright, 2015; Rochet & Tirole, 2003; Parker & Van Alstyne, 2005). For example, Cennamo and Santaló (2015, p. 12) define multi-sided platforms as “networks that bring together two or more distinct types of users and facilitate transactions among them”. Similarly, McIntyre and Srinivasan (2017, p. 143) conceptualise multi-sided platforms as “interfaces that can mediate transactions between two or more sides”.

Implicit in these definitions is the notion that value creation through multi-sided platforms is dependent on enabling interactions between different sides of the market, or, as Chakravarty et al. (2014, p. 3) note, “a core benefit that each side seeks from the platform is access to participants on the other side.” An example

of a multi-sided platform is eBay's e-commerce marketplace, which facilitates consumer-to-consumer and business-to-consumer sales. eBay's role is to attract participants to join, consummate matches between buyers and sellers, and promote value-creating exchanges by providing transactional architecture and setting rules and standards. Unlike businesses organised in traditional pipeline buyer-supplier relationships, which control a linear series of activities along the value chain (Van Alstyne et al., 2016), multi-sided platforms do not take ownership of products but rather depend on resources (e.g., skills, ideas, physical assets) and activities controlled and provided by agents on different sides of a market (Adner & Kapoor, 2010; Boudreau & Jeppesen, 2015; Thomas et al., 2014). In other words, the role of a multi-sided platform is not to develop, manufacture or (re)sell products and services but to connect different sides of a market (Hagiu, 2009). This feature also differentiates multi-sided platforms from manufacturing or product platforms that optimise product manufacturing or a family of related products in concert with a network of suppliers (Gawer, 2014; Krishnan & Gupta, 2001).

Airbus, for example, operates a manufacturing platform to source around 80% of its activities from more than 12,000 suppliers worldwide. Using its platform, Airbus can leverage exchange relationships to access external competencies, share products and services across different aircraft types, and stimulate product development with and among its supplier bases. However, although Airbus arguably plays a central, orchestrating role within a network of firms, it is still a product-centric business that focuses on the ownership and sale of products. Moreover, Airbus does not view its suppliers as required to interact with its customers. Hence, in contrast to multi-sided platforms, the interaction between the different sides is not a condition for value creation in a manufacturing platform.

Given the interdependent relationship between two or more sides of multi-sided platforms, prior research suggests that solid network externalities characterise such platforms (Evans, 2012; Hagiu, 2014; Katz & Shapiro, 1985; Parker & Van Alstyne, 2005). In the case of a two-sided platform, the logic is that a more extensive installed base of producers offering products on the platform leads to greater demand for that platform and, concomitantly, having more consumers leads to a larger supply of products (Boudreau & Jeppesen, 2015; McIntyre & Srinivasan, 2017; Song et al., 2018; Zhu & Iansiti, 2012).

The prospect of such cross-platform or indirect network effects reflects the platform literature's emphasis on parameters that give transaction partners an excellent reason to join and keep using the platform. The parameters explored to attract and lock in large numbers of exchange partners include sweetheart deals and exclusive contracting for producers (e.g., Armstrong & Wright, 2007; Hagiu, 2014; Yoffie & Kwak, 2006), policies to govern and influence behaviours of transaction partners (e.g., Tiwana et al., 2010), the creation of new features and add-ons that attract users (e.g., Gawer & Cusumano, 2008), offering convenient and

reliable ways to close transactions (Hagiu), and ways of matching users effectively, with corresponding terms at which transactions occur (e.g., Wang & Lin, 2005).

Studies have also considered different monetisation models for the various sides of markets, such as sacrificing profits on one side to grow the number of consumers and, in return, making the platform more attractive for producers on the other side (e.g., Clements & Ohashi, 2005; Eisenmann et al., 2006). This focus on selected design parameters offers valuable guidance on how individual choices may relate to the growth of the installed user base and the impact such decisions have on the other side of a platform market. Still, it fails to fully explain how platform design is impacted by expanded and interacting design choices over time. While confirming the presence of network effects and analysing the consequences of choices is undoubtedly essential to advance the study of multi-sided platforms, the research has been relatively silent on the theoretically and managerially important question of how the design of a multi-sided platform evolves, i.e. as a whole business model.

Another stream of platform research has examined interdependent value creation in platforms by a multilateral set of partners, especially in the context of platforms like Apple iOS or Mozilla Firefox that provide a standard with a technological core upon which a community of developers build (Adner, 2017; Adner & Kapoor, 2010; Ceccagnoli et al., 2012; Kapoor & Lee, 2013; Parker et al., 2017). Studies in this stream of the literature have focused on structural and evolutionary mechanisms as well as the alignment of partners that enable value co-creation, including the management and coordination of complementors to a platform (e.g., Boudreau & Jeppesen, 2015; Kapoor & Agarwal, 2017; Rietveld & Eggers, 2018). Scholars have also begun to consider the bundling of adjacent platforms (e.g., Facebook's integration of Instagram) or ‘envelopment’ (Eisenmann et al., 2011) as a market entry strategy and associated demand spillovers in complementary markets (Li & Agarwal, 2017). Hence, this stream recognises the need to go beyond the platform provider and consider connections and interactions with stakeholders that are critical in value creation.

However, while current theorising might explain the role of cooperation and competition with value-creation partners for the success of multi-sided platforms, it falls short of fully explaining how viable multisided platforms emerge and evolve when competing platforms target the same users and complementor base. Although competition between an entrant platform and an incumbent has been explored (Eisenmann et al., 2011; Seamans & Zhu, 2014; Zhu & Iansiti, 2019), prior platform research remains silent on how multi-sided platform firms interact when they all start from the same position and compete head-to-head in a new market where there is no dominant player.

### 2.6.4. Platforms as activity systems

Considering the business model as an activity system allows these questions since the definition of a business model as the architecture or system of interdependent and interconnected activities underlying value creation and capture is “precise, unifying (without being overly inclusive)” (Foss & Saebi, 2018, p. 13). Defining business models as activity systems is particularly useful to study platform firms since a focus on the interdependencies between the activities allows correct configuration of the structural relationships between the platform provider and its users, i.e., what Baden-Fuller and Haefliger (2013, p. 419) refer to as a business model “containing cause and effect relationships”.

Thus, the *activity content* refers to those activities that enable value creation and appropriation, the *activity structure* captures the order or sequencing of transactions and the market mechanism choice, and the *activity governance* refers to those who will perform certain activities, thus reflecting what partners make a business model work (Zott & Amit, 2010). The business model also offers insights into the processes that enable the evolution of a platform firm's business model over time (Zott & Amit). Studying changes in activity content, structure, and governance allows exploration of the design, management, and alteration of interdependent systems under conditions of intense rivalry.

For example, when crafting a peer-to-peer lending platform business model that matches the supply and demand of funds, choices must be made concerning what activities to perform to satisfy lenders' and borrowers' needs, how to match the demand and supply of funds, and who undertakes activities such as setting interest rates (Burtch et al., 2014; Zott & Amit, 2010). The choices among activity content, structure, and governance can also be highly interdependent. For example, a structural choice to change the lender/borrower matching mechanism requires a corresponding governance change (Cennamo & Santaló, 2013; Zott & Amit).

## 2.7. Platforms in healthcare

The platform model is well-suited to NZ’s fragmented healthcare system because it fosters interoperability, patient-centred care, and efficiency by integrating significant stakeholders. Characterised by integrated and data-sharing capabilities, platforms are, in principle, exceptionally well-suited to healthcare scenarios that necessitate integration, collaboration, and data-driven decision-making. They enable seamless information exchange and coordination among healthcare providers, enhancing patient care and outcomes (Adler-Milstein & Jha, 2017; Darwish et al., 2019). Additionally, industry platforms facilitate ecosystem

innovation, which can drive advancements in healthcare technologies and practices (Gawer & Cusumano, 2014). The main advantages are:

- **Integration for Holistic Care**

Healthcare often demands a holistic approach to patient care, particularly in managing chronic diseases or complex medical conditions. Platforms can facilitate integrating various healthcare services and specialties, ensuring that healthcare providers can access a comprehensive view of a patient's medical history (Donaldson et al., 2000). For instance, primary care physicians, specialists, pharmacists, and other relevant healthcare professionals can access a patient's electronic health record (EHR) via the platform. This integrated approach enables better communication, coordination, and continuity of care, ultimately improving patient outcomes (Adler-Milstein & Jha, 2017).

- **Shared Resources and Collaborative Care**

Platforms offer significant advantages when resource optimisation and collaborative care are paramount. Healthcare systems often grapple with the challenge of efficiently allocating resources, especially in resource-intensive specialties or during surges in patient demand. Platforms address this challenge by enabling the efficient sharing and allocation of resources (Kvedar et al., 2014; Mehrotra et al., 2016). For example, telemedicine platforms connect patients with specialists who can provide consultations remotely, regardless of geographic location. This shared resource model optimises resource utilisation and ensures patients receive timely care from the most appropriate healthcare providers (Dorsey & Topol, 2016). Additionally, platforms foster collaboration among healthcare teams, allowing professionals from different disciplines to work cohesively to address complex healthcare challenges (Ivbijaro et al., 2014).

- **Data-Driven Insights**

In an era where healthcare is becoming increasingly data-driven, platforms are invaluable for scenarios that require sophisticated data analytics and decision support. The platform model leverages advanced data analytics, AI, and machine learning to provide actionable insights. These insights are instrumental in enhancing clinical decision-making, predicting disease outbreaks, and identifying trends in population health (Beam & Kohane, 2018). For instance, platforms can analyse large datasets to identify high-risk patients who require proactive interventions for chronic disease management. This

data-driven approach improves patient outcomes and contributes to cost savings by preventing avoidable hospitalisations and complications (Raghupathi & Raghupathi, 2014; Bates et al., 2014).

### 2.7.1. Healthcare platform strengths and weaknesses

The platform healthcare delivery model represents a significant departure from the traditional pipeline approach. It emphasises integration, data sharing, and a more holistic view of patient care at a time when healthcare systems are seeking ways to improve efficiency, reduce costs, and enhance patient outcomes (Adler-Milstein & Jha, 2017; Gawer, 2014; Raghupathi & Raghupathi, 2014). By leveraging advanced data analytics and fostering coordination among healthcare providers, platforms can identify high-risk patients and manage resources more effectively (Bates et al., 2014; Porter & Lee, 2013). The main strengths and weaknesses are:

***Strengths***

- **Integration:** Perhaps the platform model's most significant strength is its ability to seamlessly integrate various healthcare services and specialties. This integration ensures patient data is accessible across the care continuum, allowing healthcare providers to make well-informed decisions and provide coordinated care (Bates & Samal, 2018). For example, primary care physicians, specialists, and even pharmacists can access a patient's electronic health record (EHR), facilitating better communication and holistic care (Adler-Milstein & Jha, 2017; Donaldson et al., 2000).
- **Shared Resources:** The platform model inherently encourages resource sharing. For instance, specialists can consult patients from different geographic regions in telemedicine platforms, maximising resource utilisation. This shared resource model extends beyond geographic boundaries and can optimise the use of specialised healthcare expertise (Dorsey & Topol, 2016; Mehrotra et al., 2016; Kvedar et al., 2014).

***Weaknesses***

1. **Learning Curve:** Adopting a healthcare platform involves a learning curve for healthcare professionals. The transition period can temporarily affect productivity and potentially hinder patient-centred care as providers adjust to new tools and workflows (Lorenzi & Riley, 2000). Moreover, migrating from legacy systems to a platform-based approach can be complex and resource-intensive (Ash et al., 2004; Gagnon et al., 2012).

2. **Privacy and Security Concerns:** Centralised platforms that store sensitive patient data may raise concerns about data breaches and patient privacy (Rindfleisch, 1997). Robust security measures are essential to mitigate these risks. Healthcare organisations must invest in cybersecurity infrastructure to protect patient data from unauthorised access (Brady, 2011; McGraw et al., 2009).

## 2.8. Guidance for decision-makers

The properties of pipelines and platforms in healthcare delivery models align with diverse healthcare service requirements. As such, decision-makers in healthcare must consider these when selecting the most appropriate model for a given situation (Porter & Lee, 2013; Rouse, 2008). These properties' guidance can empower decision-makers to make informed choices that optimise care delivery, resource allocation, and patient outcomes (Agarwal et al., 2010; Herzlinger, 2006; Porter; Rouse). There are three critical considerations for decision-makers:

1. ***Assess the Need for Standardisation and Customisations:*** When faced with a healthcare scenario, decision-makers should balance the need for standardisation and customisation. If the situation demands highly standardised processes with minimal variability, such as emergency care or surgical procedures, the pipeline model is likely the better choice (Berwick, 2003; de Vries et al., 2008). Conversely, when precision and customisation are essential, as in personalised treatment plans for chronic conditions or genetic therapies, the pipeline model can be adapted to meet these requirements (Blumenthal, 2010).
2. ***Evaluate the Necessity for Integration and Collaboration:*** Decision-makers should evaluate the degree of integration and collaboration required in the healthcare scenario. If the situation demands seamless integration of services and resources across multiple specialties or providers, as often seen in chronic disease management or telemedicine, the platform model offers the necessary capabilities (Bodenheimer et al., 2002; McDonald et al., 2007; Vest & Gamm, 2010). Platforms facilitate the sharing of resources and enable multidisciplinary collaboration, contributing to better patient care (Bodenheimer et al., 2002).
3. ***Consider the Role of Data-Driven Decision-Making:*** In an era where data-driven insights play a pivotal role in healthcare, decision-makers should assess the importance of data analytics and predictive modelling. When the scenario calls for advanced data analysis, population health management, or clinical decision support based on large datasets, leverage the platform model's data-driven capabilities (Bates et al., 2014). Platforms can generate actionable insights that inform clinical decisions, enhance preventive care, and improve healthcare system efficiency. In many healthcare scenarios, there is a need to balance efficiency with personalisation. Decision-makers should consider how to strike this balance effectively (Roski et al., 2014). For example, when managing chronic conditions, a hybrid approach

combining pipeline-like elements for standardised care with platform capabilities for personalised interventions can be a viable solution (McGinnis et al., 2013).

### 2.8.1. Demand management

Demand management involves identifying where, how and why people demand healthcare and developing the best methods of curtailing, coping with or creating demand (Heineke, 1995). Demand management efforts aim to increase demand, change the timing, or re-channel demand to other resources (Klassen & Rohleder, 2001). Demand management attempts to shift demand, while capacity management responds to demand (Heskett et al., 1990). On the demand management side, the main converging factors are an ageing and growing population, increasing incidences of diseases like diabetes and asthma, societal demand for new medical treatments and therapies, employer willingness to pay for care primarily in a tight labour market and strong economy, and the trend away from managed care (Jochmann & Leon-Gonzalez, 2004; Riphahn et al., 2003). On the capacity management side, factors that make the balancing task incredibly daunting include the static or declining number of hospital beds, increased financial pressure on hospitals, insufficient investment in base infrastructure, and growing labour shortages for skilled healthcare providers and caregivers (Wright et al., 2006).

Capacity management is concerned primarily with ensuring that the organisation can respond to the level of demand experienced (Ridge, 1998). Thus, capacity management involves decisions related to allocating critical resources such as facilities, equipment, and workforce (Smith-Daniels et al., 1988). Improving access is about getting supply and demand in equilibrium to avoid appointment backlogs and delays between when the demand initiates and when the service is delivered. The supply and demand gap not only contributes to a delay in meeting patients' needs but can also be expensive and generate waste in the system (Bain, 1956).

The experience of many healthcare organisations is that demand is neither insatiable nor unpredictable. The demand for any health service — appointment, advice, or message to a provider — is based on the local population, the scope of the provider's practice and the practice style of each provider (Korenstein et al., 2012). High and low demand can be anticipated based on the service request data. More sophisticated access systems use predictions as the framework to match supply to the needs of a population of patients for any specific service. However, offering a level of service capacity based on local demand considerations runs the risk of optimising parts of the healthcare system at the expense of the whole system, thereby leading to over- and under-supply at the national level of demand (Hussey et al., 2013; Korenstein).

### 2.8.2. Pipeline-to-platform transition

In contrast to conventional pipeline business models (Van Alstyne et al., 2016), platforms offer value through a distinct mechanism wherein monetary exchange and value propagation mirror the fluid flow within a conduit (Van Alstyne). Value traverses a linear path as it progresses sequentially along the value chain. Correspondingly, the financial transaction follows a reverse trajectory, commencing with the consumer and reverting through the distribution network to the initial producer (Gillman, 2021). In contrast, platform businesses have different value flows.

Van Alstyne et al. (2016) posit that the transition from a pipeline model to a platform model involves three fundamental shifts:

1. *The shift from resource control to resource orchestration*

   The resource-based view of competition holds that firms gain an advantage by controlling scarce and valuable, ideally inimitable, assets (Van Alstyne et al., 2016). In the pipeline world, these include tangible assets such as mines and real estate and intangible assets like intellectual property (Barney, 1991). With platforms, the assets that are hard to copy are the community and the resources its members own and contribute, be they rooms, cars, ideas, or information (Cusumano et al., 2019). In other words, the network of producers and consumers is the chief asset (Van Alstyne).

2. *The shift from internal optimisation to external interaction*

   Pipeline firms organise their internal labour and resources to create value by optimising an entire chain of product activities, from materials sourcing to sales and service (Van Alstyne et al., 2016). In contrast, platforms create value by facilitating interactions between external producers and consumers (Parker et al., 2016). The focus shifts from owning and controlling resources to orchestrating an ecosystem of participants (Cusumano et al., 2019). Instead of dictating processes, they focus on persuading participants to join and contribute to the platform (Parker et al., 2016). Consequently, ecosystem governance becomes a critical skill in platform businesses (de Reuver, 2018). Because of this external orientation, they often shed (even variable) production costs. The emphasis shifts from dictating processes to persuading participants.

3. *The shift from customer value to an ecosystem value focus*

   Pipelines seek to maximise the lifetime value of individual customers of products and services, who, in effect, sit at the end of a linear process (Van Alstyne et al., 2016). In contrast, platforms seek to maximise the total value of an expanding ecosystem in a circular, iterative, feedback-driven process (Parker et al., 2016). Sometimes, it requires subsidising one type of consumer to attract another type (Rochet & Tirole, 2003).

These three shifts illustrate how competition is more complex and dynamic in the platform world. The competitive industry forces described by Michael Porter (threat of new entrants and substitute products or services, the bargaining power of customers and suppliers, and the intensity of competitive rivalry) may still apply. However, these forces behave differently on platforms, and new factors come into play (Van Alstyne et al., 2016). New factors, such as network effects, come into play, which can significantly influence the competitive landscape (Parker et al., 2016). Therefore, executives need to pay close attention to these traditional forces and the interactions on the platform, access to participants, and new performance metrics that are more relevant in the platform context (Van Alstyne).

Interestingly, Christensen et al. (2000) describe how a traditional pipeline model evolved into a platform when Apple's handset business combined with its App Store (a marketplace that connects app developers with iPhone owners).

### 2.8.3. Health expenditure relative to GDP

The OECD countries are estimated to have spent an average of 9.2% of GDP on health care in 2022, a value almost unchanged since 2013, Figure 2.8. The United States spent the most on health care by far, equivalent to 16.6% of GDP, well above Germany, the European country with the highest spending, at 12.7%. After the United States and Germany, 15 high-income countries, including Germany, France, Sweden, and Japan, spent more than 10% of their GDP on health care. In many of the Central and Eastern European OECD countries, as well as in the newer OECD member countries from Latin America, spending on health accounted for between 6% and 9% of their GDP. Finally, Luxembourg and Turkey spent less than 6% of their GDP on healthcare (OECD, 2023).

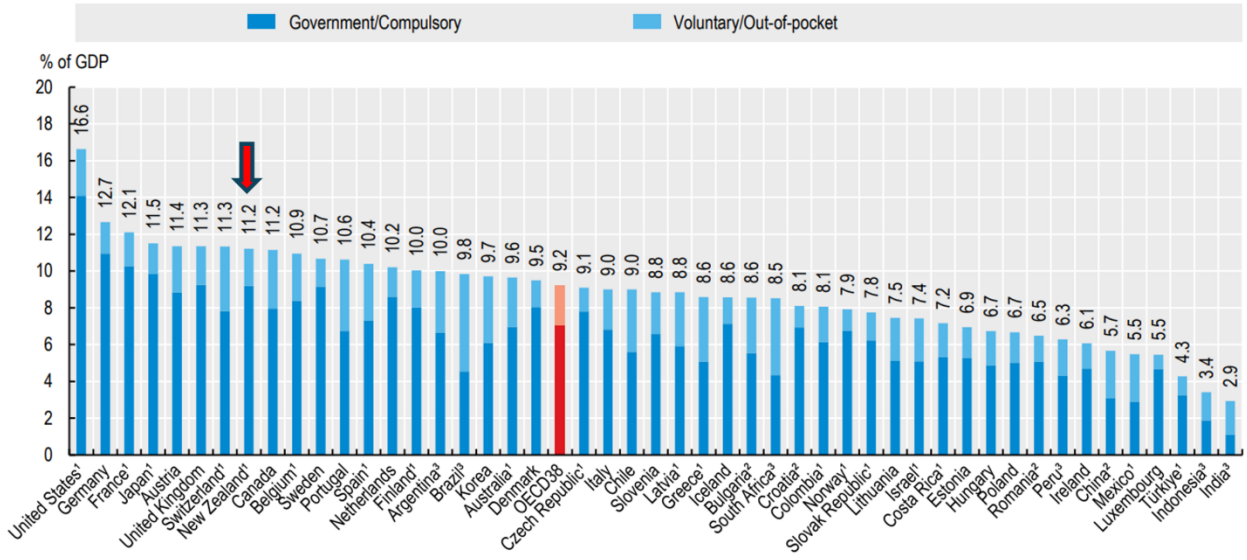



**Figure 2.8. Healthcare expenditure 2022 (% of GDP)**

Source: OECD (2023)

Health spending has outpaced economic growth across OECD countries over the past half-century. This additional spending has contributed to improvements in health outcomes and has been an essential source of economic growth and jobs. Nevertheless, financial sustainability is becoming increasingly concerning, as most countries draw their funding mainly from public sources (OECD, 2015).

In 2022, average per capita health spending in OECD countries (adjusted for differences in purchasing power) was estimated to have reached nearly USD 5,000. In the United States, it reached USD 12,555 for every US citizen. Switzerland and Germany were the next highest spenders in the OECD, but at around USD 8,000, this was still less than two-thirds of the level in the United States (Figure 2.9). After Norway and Austria, a further group of Western European countries, plus Australia, Canada and New Zealand, spent USD 6,000-7,000. Per capita, health spending broadly decreased across Southern European countries, Central and Eastern European countries, and Latin American OECD member countries, with spending in Mexico (USD 1,181) at around a quarter of the OECD average. Figure 2.9 also shows the split of health spending based on the type of healthcare coverage, either organised through government health schemes, compulsory insurance (public or private) or through voluntary arrangements such as private health insurance or direct payments by households. On average, about three-quarters of all health spending across OECD countries is financed through government or compulsory insurance schemes (OECD, 2023).

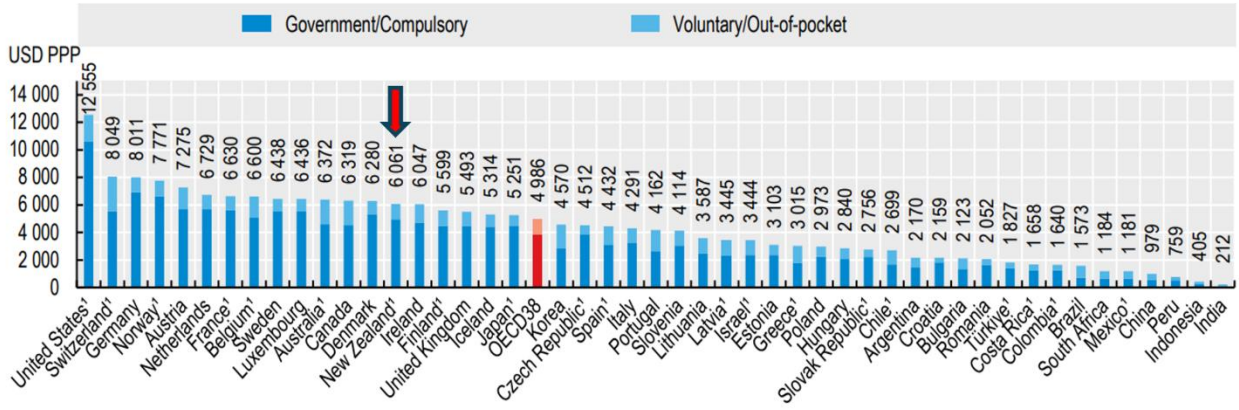



**Figure 2.9. Healthcare expenditure per capita 2022 (% of GDP)**

Source: OECD (2023)

### 2.8.4. Digital disruption and transformation

Today, digital technologies disrupt business ecosystems, domains, and individual processes (Gawer, 2014). Due to the range of benefits, long-term strategic impact, and competitive advantages, enterprises across domains are embracing this digital revolution. In the most recent articles, the vocabulary of disruption has been liberally applied to prominent technological firms like Google, Amazon, Uber, and Airbnb, describing them as 'disruptors' of existing industries through their technological platforms (Gawer). These organisations rely on vibrant ecosystems of independent complementors to supply complementary products and services that enhance the value of the core technological platform (Gawer & Cusumano, 2002; Parker et al., 2016).

Because of these so-called 'multi-sided platform dynamics' (Evans, 2012; Rochet & Tirole, 2003), which are fuelled by reinforcing network effects (Katz & Shapiro, 1994), platform ecosystems exhibit a specific structure of economic relationships among interdependent organisations (Adner, 2017); departing from the traditional contexts where disruptive innovation theory developed. Disruption in digital technologies has opened an entirely new realm of possibilities for organisations, redefining how business is conducted online and providing numerous opportunities for consumers and producers to reengage (Gawer, 2014). Digital technologies enable organisations to offer on-demand, customer-centric, personalised, contextual, and meaningful content anywhere, anytime, or on any device (Adner).

On the business-business (B-B) front, digital technologies have opened possibilities. Process optimisations, enterprise integrations, other developments, and a digital technology ecosystem have reshaped infrastructure and operations via hardware consolidation and cloud enablement (Hagiu, 2014).

At the turn of this century, Christensen et al. (2000) called on governments and healthcare industry leaders to step forward and help regulators, managed care organisations, hospitals, and health professionals work together to facilitate disruption instead of uniting to prevent it. Uber's message for healthcare is also evident; providers have three choices: ignore innovators and hope for the best, call for increasing regulation to make it harder for innovators to enter the market, or compete on quality and efficiency, disruptive though that might be (Detsky & Garber, 2016). Making the wrong choices may cause some established institutions to fail, but many more healthcare providers will realise the growth opportunities that come with disruption. Disruption is fundamental to building quality, convenient, and lower-cost healthcare systems (Christensen).

Digital transformation is reinventing and re-engineering a business to digitise an organisation. It is the deliberate and ongoing digital evolution of a company's business model, strategically, tactically, and operationally (Bowersox et al., 2005; Mazzone, 2014). Digital transformation is about leadership and is the ultimate challenge in change management, highlighting the characteristics of digital transformation, such as the importance of digital technology platforms, the emergence of distributed innovations, and the prevalence of combinatorial innovation (Mazzone).

A digital platform is an important building block, providing an essential function to a technological system, which acts as a foundation upon which other firms can develop complementary products, technologies or services. The emergence of distributed innovations means that digital technologies tend to 'democratise' the innovation process by distributing control across multiple organisations and moving the innovation activity locus toward the periphery of organisations. Combinatorial innovation suggests that digital artefacts join existing and new modules on products or services (Yoo et al., 2012). Accordingly, digital transformation strategies span the boundaries of corporate, operational, and functional strategies (Matt et al., 2015). Digital transformation can take the form of continuous improvements in the digital innovation processes in areas such as user experience, value proposition and digital evolution through platform-based innovation (Saul & Gebauer, 2018).

## 2.9. Barriers and enablers of business model change

While business model change is not recent, the magnitude of the impacts of digital technologies is incomparable. Previously, the predominant industrial organisation logic imposed a similar rationality on organisations: providing raw materials from suppliers, manufacturing the product, delivering it to customers, and collecting revenues (Massa & Tucci, 2013). However, the recent success of innovative business models that have disrupted and transformed industries cannot be explained merely by Uber, Airbnb, and others introducing new products or services, but rather by the novel way they do business

(Massa). For example, while Netflix did not invent the movie rental business, it has transformed how movies are consumed (Kurti & Haftor, 2015).

Table 2.4 is a representative list of the barriers and enablers to business model change. Several scholars have explored the process itself. For example, Sosna et al. (2010) used the lens of organisational learning to argue that business models evolve through experiential trial-and-error learning. Their research shows that a business model evolves through exploration and exploitation stages. In the exploration process, business model innovation choices are grounded firmly in prior knowledge and cognitive schemas, which later follow changes in the firm's core logic through double-loop learning of the failures arising from trial-and-error experimentation. The emergence of a business model and the institutionalisation of learning as organisational routines and processes characterise exploitation. Typically, change initiatives begin with individual managers and progress to include top management before involving the entire organisation. Thus, business model innovation is a significant point of organisational change that changes the core logic of the whole organisation (Sosna).

**Table 2.4. Barriers and enablers of business model change**

| Barrier | Author | Focus |
|---|---|---|
| Dominant logic/cognitive barrier | Chesbrough & Rosenbloom (2002), Chesbrough (2010) | Firm-level |
| Conflict of existing assets and business model | Amit & Zott (2001); Chesbrough (2010) | Firm-level |
| Lack of top management leadership capabilities | Doz & Kosonen (2010) | Firm-level |
| Interdependence among key actors of the network | Sandström & Osborne (2011) | Network-level |
| **Enabler** | **Author** | **Focus** |
| Experimentation | Chesbrough (2010); McGrath (2020) | Firm-level |
| Trial-and-error-learning | Sosna et al. (2010) | Firm-level |
| Effectuation | Chesbrough (2010) | Firm-level |
| Leading change | Chesbrough (2010) | Firm-level |
| Identification of all critical and affected parties | Sandström & Osborne (2011) | Network-level |
| Alignment of incentives throughout the network | Sandström & Osborne (2011) | Network-level |

Source: Adapted from Kurti and Haftor (2015)

Chesbrough and Rosenbloom (2002) discuss the challenge of the cognitive barrier imposed by the old business model, in which managers have no clear idea of the suitable business model (Kurti & Haftor, 2015). Chesbrough (2010) later explores the barriers and enablers of successful business model change and argues that one of the main challenges to the incumbents lies in the tension between the existing and new business models. However, this view takes for granted that managers know the 'right' business model in advance. For this reason, the overarching objective of the present study is to understand the obstacles and enablers to implementing such a platform-based healthcare system in New Zealand from the executive leadership's perspective.

Chesbrough (2010) posits three main processes that may enable successful business model innovation: experimentation, effectuation and leading change. Experimentation refers to testing candidate business models with real customers in actual transactions. Another experimentation method is discovery-driven planning (McGarth, 2010), which refers to the means to model hidden assumptions that are tested directly and evaluated (Chesbrough). Effectuation represents a model of entrepreneurial decision-making in the absence of pre-existing markets, where managers do not analyse the market as much as they enact it, with a third success factor being the successful leadership of organisational change. Such a process requires organisations to understand and have in place suitable agents that can lead the organisational change (Chesbrough; Doz & Kosonen, 2010).

Sandström and Osborne (2011) bring an insightful perspective to business model change challenges. They argue that identified challenges mainly focus on internal organisational matters and tend to neglect how business models span inter-organisational boundaries. They also state that the firm's interdependence complicates business model change due to the other actors outside its borders.

There appears to be agreement, both in theory and practice, that transforming the business model from traditional to digital is crucial for organisations to survive. Nevertheless, this transformation is multifaceted and often does not yield fruitful results. In their study, Amit and Zott (2001) argue that traditional economic explanations of value creation can only partially explain the value creation in the digital business. These theories are explicitly tailored for conventional manufacturing firms and offer firm-centric perspectives, where the business model emerges as a unit of analysis that encapsulates how firms create economic value by using digital technologies.

Kurti and Haftor (2015) state that today's digital transformation of business models implies multi-actor coordination, in which no single authority can command the desired behaviour other than by employing negotiation. The authors also illustrate how traditional and digital business models represent two distinct

logics, with the former based on conventional economic rules and the latter on the economics of digital information, which challenges traditional managerial wisdom and acts as a filter that enables or hinders opportunities, adequate analysis, planning and decision-making (Kurti).

Today's digital business models challenge the focal firm-centric view of value creation to consider the coexistence and coordination between several network actors, each bound by their dominant logic (Kurti & Haftor, 2015). Amit & Zott (2001) claim that experimentation, effectuation, trial-and-error and leadership change are the central activities guiding successful business model change. However, there have been few empirical insights to support these claims. For example, although the now-defunct *Blockbuster Video* did experiment with new business models, the evidence suggests this was insufficient because management used the dominant logic of value creation within their areas of expertise (Kurti)

## 2.10. Transformation of the patient pipeline value stream

The healthcare industry is undergoing a profound transformation, driven by advancements in medical technology, evolving patient expectations, and the increasing need for cost-effective care delivery (Porter & Lee, 2013). Patient pipeline transformation refers to the strategic overhaul of processes and workflows in delivering healthcare services to patients in these settings. Within this context, secondary and tertiary healthcare settings stand at the forefront of specialised care and medical interventions, making optimising patient pipeline value streams a critical priority (Womack et al., 1991).

Kumar et al. (2012) introduced a holistic framework for understanding and implementing patient pipeline transformation in secondary and tertiary healthcare settings. Transformation involves two primary dimensions: 'internal transformation' and 'external transformation', which are interconnected and equally crucial in achieving successful outcomes.

### 2.10.1. Change management

The successful transformation of patient pipeline value streams within healthcare optimisation begins with effective change management practices (Kotter, 1995). As with anywhere else, change in healthcare settings can be resisted due to the industry's high-stakes nature and deeply ingrained practices (Canjuga et al., 2010). Healthcare leaders and managers must employ evidence-based change management strategies to facilitate a smooth transition (Damschroder et al., 2009).

Effective change management practices include clear communication of changes, stakeholder engagement, and resistance management strategies (Braithwaite et al., 2018). Moreover, healthcare leaders should create

a compelling vision for the transformation, emphasising how it aligns with the organisation's mission and ultimately benefits patients (Kotter, 1995).

Healthcare optimisation must also invest in training and education to ensure staff members have the necessary skills and knowledge to adapt to new processes and technologies (Canjuga et al., 2010). Additionally, involving front-line healthcare professionals in the planning and decision-making can increase their ownership of the changes and reduce resistance (Greenhalgh et al., 2004).

### 2.10.2. Operations management

Operations management is at the core of improving patient pipeline value streams (Reponen et al., 2021). Secondary and tertiary healthcare settings are often characterised by complex processes and interconnected tasks (Yadav et al., 2018). Applying principles of operations management, such as Lean, Agile or Six Sigma, can help streamline operations, reduce waste, and enhance resource allocation (Bhamu & Sangwan, 2014). Lean principles, for example, focus on identifying and eliminating non-value-added activities in healthcare processes (Spear & Bowen, 1999) and can lead to reduced patient waiting times, improved resource utilisation, and ultimately, better patient care experiences (D'Andreamatteo et al., 2015). Implementing efficient operations management strategies is essential for enhancing patient outcomes and cost-effectiveness.

### 2.10.3. Business process reengineering

Organisations must be willing to rethink and redesign their healthcare processes in the quest for patient pipeline transformation (Gyngell, 1994). Business process reengineering (BPR) is a methodology that entails the complete overhaul of processes to improve efficiency, effectiveness, and quality significantly (Davenport & Short, 1990). BPR involves a systematic analysis of the existing process, the identification of bottlenecks, and the reimagining of workflows (Gyngell). Digital technologies, automation, and data-driven decision-making may create more streamlined and patient-centred processes (Reponen et al., 2021). However, BPR must maintain or enhance the quality of care provided (Davenport) and prioritise patient safety and best interests.

### 2.10.4. Organisational behaviour

The behaviour and culture of healthcare organisations deeply influence the success of patient pipeline transformation initiatives (Scott et al., 2003). Organisational behaviour encompasses the attitudes, beliefs, and actions of healthcare professionals and the overall culture within the organisation (Donnelly et al.,

1987). Encouraging a culture of continuous improvement, patient-centricity, and collaboration is essential (Scott). Healthcare leaders should lead by example, demonstrating a commitment to patient-focused care and continuous learning (Edmondson, 1999). Incentives and recognition programs can motivate staff to embrace change and contribute to the transformation process (Schein, 2017). Additionally, fostering a culture of psychological safety, where healthcare professionals feel comfortable voicing concerns and suggesting improvements, can help identify and address issues that may arise during the transformation journey (Edmondson).

## 2.11. Internal transformation

### 2.11.1. External relationships and stakeholder involvement

Engaging external stakeholders, including patients, referring physicians, insurers, regulators, and community organisations, is vital for comprehensive transformation (Shi, 2023) because healthcare settings extend beyond the boundaries of a single organisation and involve a network of stakeholders, each with its interests and roles (Shortell et al., 1994). Examples include:

**Patient Involvement:** Patients are central stakeholders in healthcare transformation (Barello et al., 2012). Thus, patient perspectives, needs, and preferences perhaps gained via patient advisory councils should inform the transformation process (Coulter & Ellins, 2007).

a. **Referring Physicians:** In secondary and tertiary care settings, referrals from primary care physicians are common (Lam et al., 2018). Building strong relationships and effective communication channels with referring physicians can ensure seamless patient transitions and improve the overall quality of care (Kuo et al., 2009).
b. **Insurers and Payers:** Healthcare reimbursement and payment models are evolving (Landman et al., 2018). Engaging with insurers and payers to align incentives and facilitate the adoption of value-based models can be a critical aspect of external transformation (Landman et al., 2018).
c. **Regulators and Compliance:** Compliance with healthcare regulations and standards is a fundamental requirement. Collaboration with regulatory bodies and adherence to best practices are essential to avoid legal issues and maintain quality of care (Laske-Aldershof et al., 2004).

### 2.11.2. Power and dependency dynamics

Understanding power dynamics and stakeholder dependency is critical in external transformation (Shortell et al., 1994). Some stakeholders may have more influence or control over the patient pipeline value stream

(Fottler & Malvey, 2010). Recognising these dynamics can help healthcare organisations navigate negotiations, collaborations, and conflicts effectively (Fottler).

a. **Negotiating Power:** Different stakeholders may hold varying degrees of negotiating power (Hennessey et al., 2023). For example, pharmaceutical companies or medical device manufacturers may have significant influence due to their role in the supply chain. Understanding and balancing these power dynamics is essential for fair and effective collaborations (Hennessey).
b. **Patient Empowerment:** Patients are increasingly empowered to make healthcare decisions (Frosch et al., 2001). Understanding and respecting their autonomy and preferences are essential for patient-centred care (Frosch). Shared decision-making and patient education can empower patients to participate actively in their healthcare journey (Barry & Edgman-Levitan, 2012).
c. **Interorganisational Collaboration:** In healthcare transformation, collaborative networks between healthcare organisations can be beneficial (Forrest et al., 2002). These networks can facilitate information sharing, coordinated care, and resource pooling (Forrest).

## 2.12. Overcoming barriers and leveraging enablers

### *Barriers*

a. **Resistance to Change:** Resistance to change is a common barrier in healthcare settings (Greenhalgh et al., 2004). Some healthcare professionals accustomed to established practices may refuse to embrace new technologies or workflows. Addressing this resistance requires proactive change management strategies, clear communication, and education (Greenhalgh).
b. **Resource Constraints:** Limited budgets and resources can hinder transformation efforts (Shortell et al., 1994). Healthcare optimisation must carefully allocate resources, prioritise initiatives, and seek cost-effective solutions. Collaboration with external partners can also help access additional resources (Shortell).
c. **Regulatory Hurdles:** The healthcare industry is highly regulated, and compliance with regulations can be challenging during transformation. Organisations must invest in legal and regulatory expertise to navigate these challenges effectively (Shortell et al., 1994).

### *Enablers*

a. **Leadership Commitment:** Strong leadership support is a fundamental transformation enabler (Shortell et al., 1994). Leaders should champion the transformation cause, set a clear vision, and lead by example, as their commitment fosters a culture of innovation and change (Shortell).
b. **Data Analytics:** Data-driven decision-making is a powerful transformation enabler. Healthcare optimisation should invest in robust data analytics capabilities to monitor progress, identify areas of improvement, and make informed decisions (Shortell et al., 1994).
c. **Collaborative Networks:** Building collaborative networks with other healthcare providers, research institutions, and community optimisation can facilitate smoother patient transitions, improve care coordination, and share best practices (Shortell et al., 1994).

The transformation of patient pipeline value streams in secondary and tertiary healthcare settings is a complex and multifaceted undertaking (Shortell et al., 1994). It involves two primary dimensions: 'internal transformation' and 'external transformation,' both interconnected and equally vital for success. By addressing these dimensions comprehensively, healthcare organisations can overcome obstacles and leverage enablers to enhance patient care quality, operational efficiency, and healthcare delivery (Shortell).

Transformation requires effective change management practices, streamlined operations, business process reengineering, and fostering a culture of continuous improvement within healthcare optimisation. Simultaneously, it necessitates the engagement of external stakeholders, recognition of power and dependency dynamics, and establishment of collaborative networks (Shortell et al., 1994).

Leadership commitment, data analytics, and strategic partnerships can overcome barriers like resistance to change, resource constraints, and regulatory hurdles. By embracing these principles and dimensions, healthcare optimisation can successfully navigate the evolving healthcare landscape and, most importantly, improve patient outcomes and experiences. Hence, patient pipeline value stream transformation is not just a strategic imperative (Shortell et al., 1994).

## 2.13. Transformational change

Overcoming barriers and harnessing enablers stand as fundamental imperatives within the realm of successful organisational reconfiguration. Challenges emerge as contextual factors resistant to outright elimination in this intricate landscape, necessitating deft management strategies. The organisation's dynamic capability, an integral facet of its operational framework, profoundly shapes its capacity to

confront and address these challenges. Indeed, the adept management of challenges not only influences dynamic capability but also holds sway over the organisation's ability to surmount barriers to change, thus directly impacting its trajectory. Helfat et al. (2007) underscore the critical need for research aimed at unravelling the intricate processes underpinning dynamic capabilities while also shedding light on the constraints encountered when charting new strategic trajectories (Helfat; Eisenhardt & Martin, 2000; Teece, 2007).

Amid the tapestry of challenges, barriers, and enablers lie elements that exhibit characteristics akin to micro-foundations conducive to fostering dynamic capabilities (Teece, 2007; Zollo & Winter, 2002). Environmental or internal organisational change constraints can also exist (Barney, 1991). Within the nuanced context of a specific firm, challenges such as navigating global organisational paradigms and fostering stability amidst change can be construed as environmental constraints. On the other hand, barriers such as entrenched institutional behaviour and the overarching financial model governing decision-making pathways constitute internal constraints on change (Ambrosini & Bowman, 2009). However, unlike environmental constraints, internal hurdles are not insurmountable; the organisation possesses the agency to address and overcome them. Given its significant influence over the organisation's capacity to reconfigure, the financial model assumes paramount importance and necessitates attention, ideally during the sensing phase when adapting the business model to evolving requirements (Helfat et al., 2007; Teece).

Despite the acknowledged significance of managers and individuals in discussions revolving around dynamic capabilities (Eriksson, 2014), empirical research dedicated to their roles remains somewhat sparse. Felin et al.'s (2012) delineation of the three primary micro-foundations—individuals, processes and interactions, and structure—is a foundational framework for identifying and categorising micro-foundations in practical contexts. Similarly, the proposed dynamic capability of organisational change capacity (Heckmann et al., 2016) is a multifaceted phenomenon encompassing individuals, processes and interactions, and organisational structure (Judge & Douglas, 2009). This intricate tapestry finds expression in various facets such as employee attitudes (Andreeva & Ritala, 2016), leadership capabilities (Judge; Heckmann), organisational systems and processes (Heckmann), and organisational culture (Judge; Heckmann). Notably, several barriers and enablers identified in this study intertwine with interactions between individuals and teams through communication, information sharing, and cooperation.

Establishing the organisation hinges upon purposeful interactions and cultivating a shared vision among a cohort of individuals. Processes, structures, and routines intricately shape these interactions; corporate culture, embodied in values and norms, serves as the guiding beacon, delineating behavioural norms and expectations (Schein, 2017). Tensions may arise when observed behaviour deviates from prescribed

structures, processes, and routines. Salvato and Vassolo (2018) expound on dynamic capabilities emerging from a firm's unique and challenging-to-replicate configuration, integrating employees to varying degrees alongside the quality of their interpersonal connections.

The interpersonal connections among employees serve as the vital conduit between the micro/individual and macro/organisational realms. The organisation's division into functions, groups, and teams establishes inherent structures that profoundly influence actions and interactions. Scrutinising the organisation's composition may yield invaluable insights into its capabilities and performance (Barney & Felin, 2013). Should organisational structures segregate functions extensively, each may engender its distinct culture, fostering potential tension. These structures may require dismantling to promote novel and purposeful interactions (Mintzberg, 1980). It becomes evident that organisational design plays a pivotal role in dictating the facilitation or hindrance of interactions within the organisational ecosystem (Lawrence & Lorsch, 1967; Tushman & O'Reilly, 1996).

### 2.13.1. Change management

Vaghefi et al. (2018) advocate for a nuanced multilevel framework to comprehend Knowledge Transfer (KT), delineating three core levels: individual, team/exchange, and organisation, as depicted in Figure 2.10. At the individual level, factors emphasise personal attributes like the capacity and inclination to transfer knowledge and information.

While primarily operating at the micro-level, these individual factors can shape the KT process through their interplay with macro-level dynamics. For instance, individuals' lack of motivation is a barrier to knowledge transfer, yet organisational norms regarding KT may mitigate this effect (Quigley et al., 2007). When examining enablers and barriers, factors tied to knowledge and the sender’s absorptive capacity and motivation typically manifest at the micro-level within organisations (Minbaeva et al., 2003; Szulanski, 1996). In contrast, team/exchange factors operate at an intermediary level, bridging the micro and macro scales.

Their impact on KT becomes evident during knowledge transfer interactions among senders and receivers within the organisation (Hislop, 2003). In such instances, conducive factors include communication channels' nature, existing relationships' closeness, and knowledge availability (Cummings & Teng, 2003; Gupta & Govindarajan, 2000).

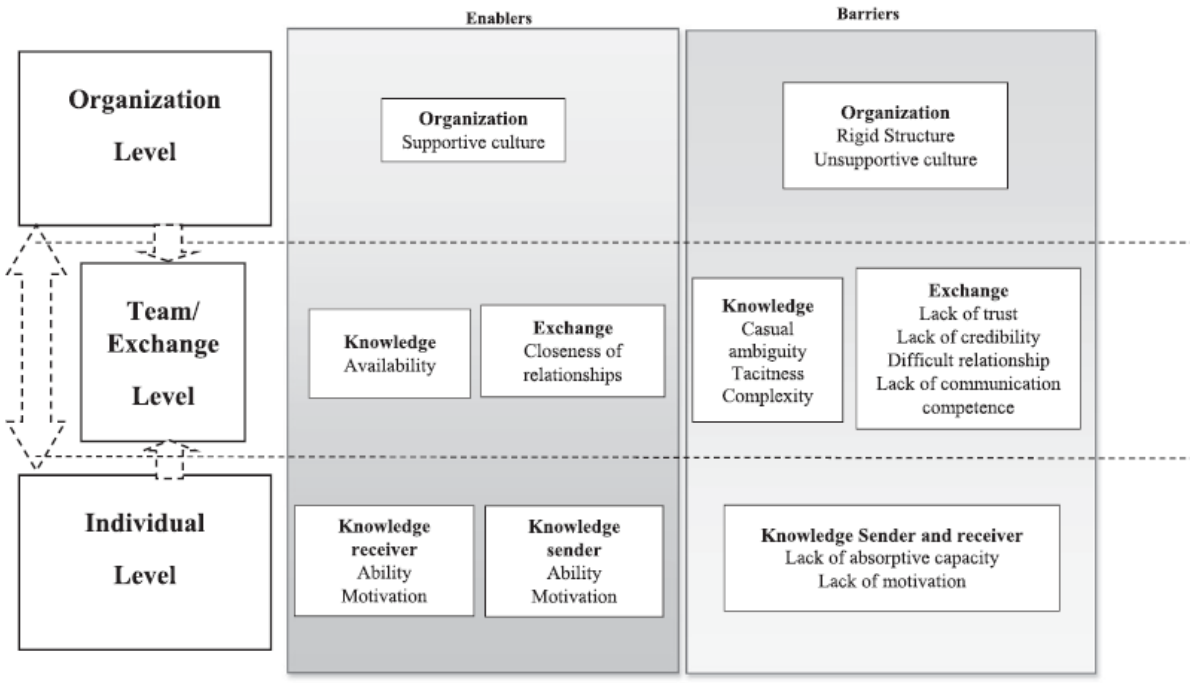



**Figure 2.10. Multilevel model of knowledge transfer**

Source: Vaghefi et al. (2018)

Compared to the micro-level factors, team/exchange factors work at a mid-level (between micro-level and macro-level). The effect of these factors on KT mainly becomes apparent when the transfer of knowledge between a sender and a receiver occurs in the organisation. On such occasions, enablers related to the nature of communication channels, existing relationships (closeness of relationships) and the availability of transferred knowledge are key factors facilitating the transfer process (Argote & Ingram, 2000; Hansen, 1999). Transfer-dependent barriers such as those that relate to the nature of transferred knowledge (ambiguity, tacitness and complexity) as well as those that relate to exchange (lack of trust, lack of credibility, complex relationships and lack of communication competence) play an essential role in the process (Levin & Cross, 2004; Szulanski, 1996).

Other macro/micro-level factors can influence mid-level factors on transfer (represented by arrows in Figure 2.10). An example would be a situation where individual characteristics define closeness in relationships, which may eventually foster or inhibit KT (Szulanski, 1996). Finally, organisation-level factors (related to organisational culture and structure) define the environment where KT occurs (Minbaeva et al., 2002). Macro-level factors can provide a setting where KT might be facilitated or inhibited, such as establishing supportive policies and industry norms (Argote & Ingram, 2000). For instance, the organisational culture that promotes individual collaboration can increase employee communication

(Wiewiora, 2013). In such environments, the tendency to share and exchange knowledge will be high, and individuals will eagerly exchange their knowledge (Jones & George, 1998). In contrast, an uncooperative culture might degrade individual communication and impede KT. Similarly, a rigid organisational structure can result in a lack of communication or difficulty in the relationships between the sender and the receiver of knowledge (Burns & Stalker, 1994; Jones).

Hence, such organisational forms can block the flow of knowledge, especially when it is tacit (Grant, 1997). In addition to their direct effect on KT, macro-level factors may influence the impact of other lower-level factors on KT. For example, organisational culture can modify an individual's attitude toward sharing and increase the intention to share explicit and tacit knowledge (Bock et al., 2006). Figure 2.11 presents the process model of Knowledge Transfer, elucidating the intricate dynamics involved in knowledge transfer within organisational contexts.

Transfer-dependent barriers, such as those linked to knowledge's nature (ambiguity, tacitness, complexity) and exchange (lack of trust, credibility, complex relationships, communication competence), significantly influence the process (Szulanski, 1996). Some intermediary factors may moderate other macro/micro-level factors' effects on knowledge transfer. For instance, individual characteristics may influence relationship closeness, facilitating or hindering KT (Hansen, 1999; Reagans & McEvily, 2003).

At the organisational level, factors encompass organisational culture and structure, defining the context in which KT unfolds. These macro-level elements can either facilitate or impede KT. For example, a collaborative organisational culture fostering individual interaction can enhance employee communication (Wiewiora, 2013). In such environments, the propensity to share and exchange knowledge is high, and individuals readily engage in knowledge exchange (Jones et al., 2006). Conversely, an uncooperative culture may hinder communication among individuals and impede KT. Similarly, a rigid organisational structure may obstruct communication and strain relationships between knowledge senders and receivers, especially for tacit knowledge (Grant, 1997).

Moreover, macro-level factors directly influence KT and modulate the effects of lower-level factors. For instance, organisational culture can shape individuals' attitudes toward sharing and promote their inclination to share explicit and tacit knowledge (Bock et al., 2006).

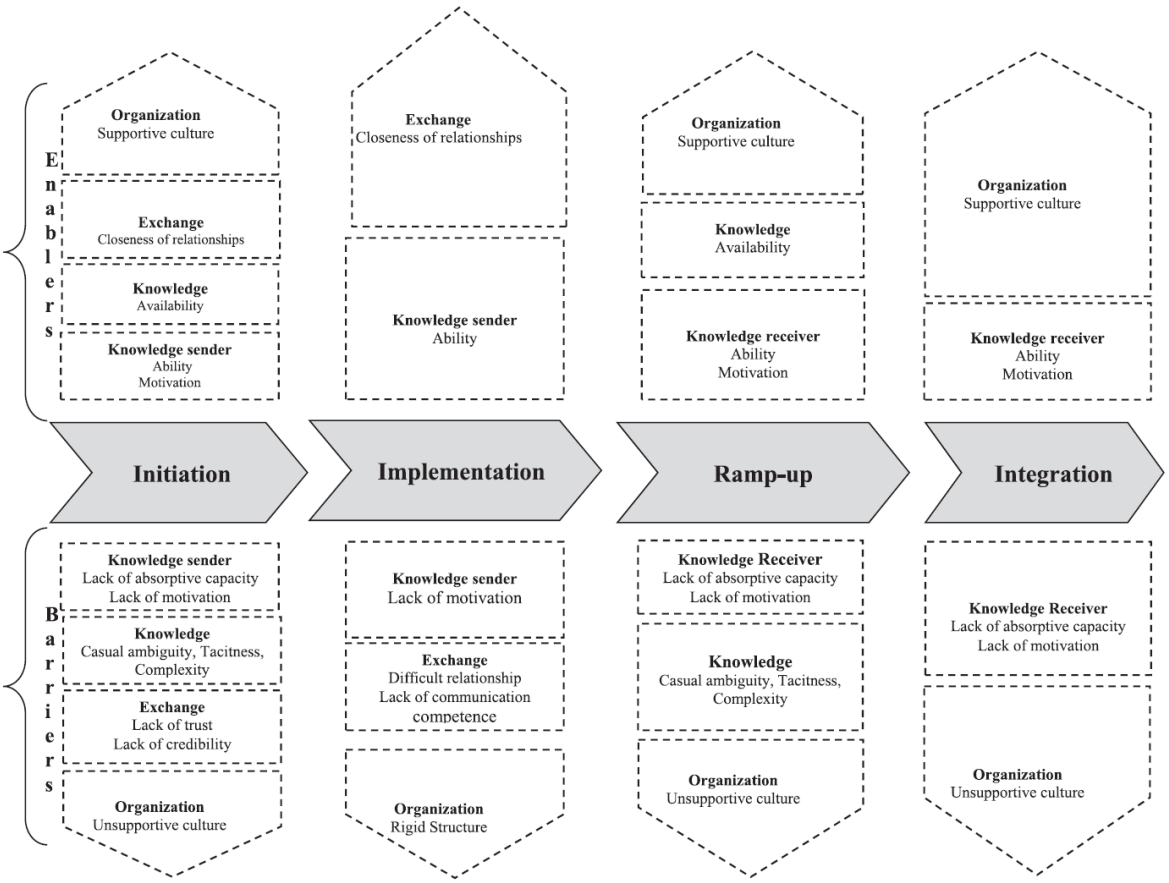



**Figure 2.11. Knowledge transfer process model**

Source: Vaghefi et al. (2018)

By embracing a multilevel perspective, researchers and practitioners can discern the interconnectedness of individual, team/exchange, and organisational factors in influencing knowledge transfer processes (Foss & Pedersen, 2004). This comprehensive understanding can inform interventions and strategies to optimise organisational knowledge transfer, fostering innovation, learning, and competitiveness (Argote & Ingram, 2000; Grant, 1996).

### 2.13.2. Business process re-engineering

Reengineering entails total dissociation from current practices and 'radical' rethinking (Hammer & Champy, 1993; Hammer & Stanton, 1995). Reengineering is 'the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary performance measures, such as cost, quality, services and speed' (Hammer & Champy). It is, by definition, transformational: it occurs at the organisational level and is radical, discontinuous, and voluntaristic.

First, the change occurs at the level of the individual organisation and industry conditions are often used to argue for its necessity. However, these are secondary to internal organisational factors. The 'real push to development comes from within' the organisation, not from 'interactions between entities' (Van de Ven and Poole, 1995). In this sense, reengineering is akin to strategy because it represents actions meant to reposition the organisation within its competitive environment.

Second, reengineering represents a radical change. It focuses on 'quantum leaps in performance,' not on marginal improvements (Hammer & Stanton, 1995). It requires radical rethinking (Carr & Johansson 1995; Hammer & Champy 1993; Hammer & Stanton 1995), total dissociation from current practices, and 'throwing away and starting over; beginning with the proverbial clean slate and reinventing how you do your work' (Hammer & Stanton).

Third, reengineering is voluntaristic, with the direction for this radical rethinking coming unequivocally from the top. The leader acts as a 'visionary and motivator' (Hammer & Champy, 1993), instilling every employee a sense of purpose and mission. Further, the leader imbues the organisation with 'the spiritual energy it needs on a voyage into the unknown' (Hammer & Champy). In addition to providing messianic leadership, leaders must be authoritarian: 'An effective reengineering leader must be one part visionary, one part communicator, and one part leg breaker' (Hammer & Stanton, 1995). Leaders who insist on 'slapping peoples' wrists instead of breaking their legs' (Hammer & Stanton) exhibit weakness and compromise the success of reengineering efforts.

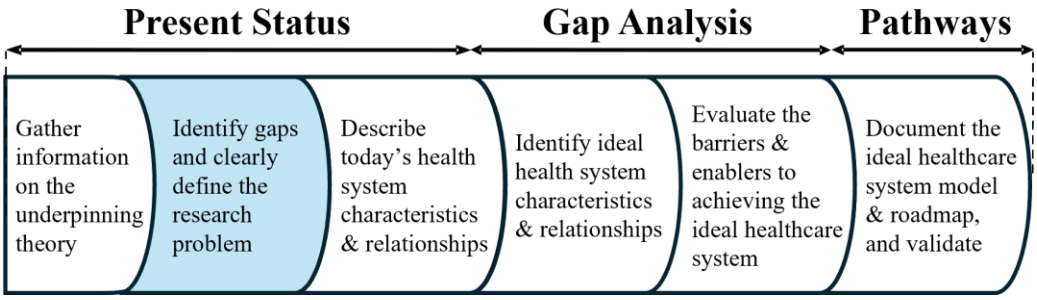
Although there is a voluminous literature on reengineering in hospitals, there is little data on how many have undergone true reengineering. Instead, normative articles that promote reengineering but fail to provide data to support the claims and studies of hospitals that allegedly reengineered dominate the literature. Such normative articles typically use Hammer and Champy's (1993) definition as their starting point, thus firmly rooting themselves in reengineering as transformational change before exhorting them to adopt reengineering because of the rapid changes and competitive pressures in an increasingly turbulent environment (Salmon, 2021; Westphal et al., 1997).

Reengineering will improve performance and help the organisation build 'better relationships among key stakeholders' (Boland, 1996). It will improve 'all dimensions of a function or organisation (i.e., work process, technological and human dimensions)' (Freed & Klugman, 1997) and achieve 'goals of lower cost, higher quality, and improved access' (Lin & Vassar, 1996). It will 'enhance patient care, as well as generate dramatic cost savings and expanded roles for health care professionals' (Leat et al., 1997). A shortcoming of this literature, as with normative literature in general, is the lack of substantiation (Bigelow & Arndt,

2005). Some articles provide brief vignettes but fail to provide sufficient information to assess the extent or success of the efforts. Targets and goals may be presented, for example, when one hospital is said to plan to ‘cut operating expenses and improve quality of care’ (Wager & Ritzman, 1995), but goals are not outcomes.

# Chapter 3: Research Problem and Associated Frameworks

## 3.1. Introduction




Chapter 3 is a pivotal juncture in this academic thesis because it navigates the research problem's intricacies, and the theoretical frameworks judged essential for the investigation. The chapter lays the groundwork for in-depth analysis by presenting the research questions arising from the gaps identified in the literature and by introducing critical theoretical perspectives that can provide valuable insights into adopting and disseminating innovations within the New Zealand healthcare context. By synthesising theoretical insights with empirical inquiry, this chapter sets the stage for a nuanced examination of the subject matter, advancing the scholarly discourse and contributing to the body of knowledge in the field.

## 3.2. Literature gaps

Reviewing prior studies into business model change indicates that researchers have not sufficiently scrutinised transformational business model change/innovation. While some solid ground exists around the factors that hinder/enable *evolutionary business model change, an* explanation of the aspects relating to transformational change is lacking. For example, Sandström and Osborne (2011) highlight that the barriers and enablers identified are not specific to business model change and resemble any other type of organisational renewal. Most studies also disregard the main distinguishing feature of the platform business model, its secure connection to the network. Instead, they spotlight the focal firm and focus on traditional barriers, such as the conflict between current assets and business models, lack of leadership and the dominant logic (Kurti & Haftor, 2015).

The literature review revealed that research into the nature of specific business models is needed, and how the features inherent in digital information products that challenge managerial beliefs can provide deep insights into how organisations should implement a digital platform business model transformation (Kurti & Haftor, 2015). Also required is research into the perceived barriers and enablers to adopting platform-

based business models in traditional (health) sectors dominated by pipeline business model thinking. As Chesbrough and Rosenbloom (2002) highlight, dominant logic is the main barrier to successful business model change. It is especially relevant when transforming a business model from traditional to digital due to the distinctive nature of the two logics.

## 3.3. Research questions

Given the poor state of public healthcare in New Zealand, this study aimed to derive the best business model for delivering an optimal healthcare system and the associated implementation strategy. The study investigates the present health service status and the perceived obstacles and enablers of a suitable new operating model for the New Zealand health sector. Essentially, this research sought answers to three primary research questions (RQs), which act as guiding lights, directing the inquiry towards a comprehensive understanding of the phenomenon and setting the stage for subsequent analyses:

RQ1: What business model is best suited to delivering New Zealand's ideal healthcare system?

RQ2: What are the critical enablers and barriers to implementing such a business model?

RQ3: What can the relevant stakeholders do to address the barriers effectively?

Three secondary research questions support the above:

SQ1: What are the characteristics of the ideal New Zealand healthcare system?

SQ2: How does the platform business model differ fundamentally from the pipeline business model concerning the dominant value creation logic?

SQ3: What are the advantages and disadvantages of adopting a platform business model for healthcare provision in New Zealand?

The emphasis is on *identifying* the best business model characteristics and *overcoming* the barriers and enablers to achieving a transformational level of sector and organisational change.

## 3.4. Associated theoretical frameworks

Delivering qualitative research findings of conceptual value that change how users think about problems, persons, or events (Sandelowski, 2004) requires practitioners to expand their conceptual repertoire for

transforming New Zealand's healthcare sector. Researchers claim it is more appropriate to adopt multiple theories to elucidate organisational behaviours because of limitations in the single theory approach (McIvor, 2009; Singhal & Singhal, 2012). Indeed, many theories have emerged in the last two decades that foster new, interesting, and pragmatic views on management decisions (Carter & Rogers, 2008; Sousa & Voss, 2008). Because this research focused on transformational change within the healthcare system, several theories were judged potentially useful:

- Organisational Change Management Theory
- Health Policy and Governance Theory
- Technology Acceptance Model
- Strategic Management Theories—Resource-Based View, Dynamic Capabilities Theory, Resource Dependence Theory, and Balanced Scorecard
- Stakeholder Theory

### 3.4.1. Organisational Change Management Theory (OCMT)

Organisational Change Management Theory (OCMT) provides a robust framework for understanding the dynamics of organisational transformation, mainly how the strategic intent of senior stakeholders influences the preparedness of managers and the broader organisation for change. This theory encompasses various models and principles that elucidate the processes and factors contributing to successful change initiatives.

At its core, OCMT posits that change within an organisation is not merely a structural adjustment but a complex process involving psychological, cultural, and operational shifts. One of the seminal models in this theory is Lewin's Change Management Model, which outlines three critical stages: unfreezing, changing, and refreezing (Smith, 1951). This model highlights the importance of creating a perceived need for change (unfreezing), implementing new methods or behaviours (changing), and solidifying these changes to ensure they become part of the organisational culture (refreezing). Senior stakeholders play a crucial role in the unfreezing stage, where their strategic intent can significantly impact the organisation's readiness for change by influencing attitudes and reducing resistance.

Kotter's (1995) Eight-Step Change Model further refines our understanding by detailing specific steps leaders must take to drive change successfully. These include establishing a sense of urgency, creating a guiding coalition, developing a vision and strategy, and communicating the change vision. Through their strategic intent, senior stakeholders are pivotal in establishing a sense of urgency and articulating a clear

vision, which is essential for garnering support from managers and employees alike. The strategic direction set by these leaders can either facilitate or hinder the change process, depending on how well it aligns with the organisation's values and the perceived benefits by its members.

Furthermore, the McKinsey 7-S Model emphasises the interdependence of seven key organisational elements: strategy, structure, systems, shared values, style, staff, and skills (Waterman et al., 1980). The strategic intent of senior stakeholders directly influences the strategy component, subsequently affecting all other elements. For instance, a well-articulated strategy that aligns with the organisation's shared values can enhance readiness for change by fostering a cohesive and motivated workforce. Conversely, misalignment between the strategic intent and organisational values can lead to resistance and reduced effectiveness of change initiatives.

Change readiness within an organisation also depends on psychological safety (Edmondson, 1999). Psychological safety refers to the extent to which employees feel safe taking risks and voicing their opinions without fear of retribution. Senior stakeholders' strategic intent can foster an environment of psychological safety by promoting transparency, open communication, and support for innovation. This fosters managers and employees to engage with the change process more actively and positively.

### *Strengths of the OCMT*

One of OCMT's primary advantages is its holistic approach to organisational transformation. This theory considers structural adjustments and psychological, cultural, and operational shifts, offering a comprehensive understanding of the change process. With its unfreezing, changing, and refreezing stages, Lewin's Change Management Model underscores the need to create a perceived need for change, implement new methods, and solidify these changes to become part of the organisational culture (Smith, 1951). The structured approach ensures that change is initiated and sustained over time.

Moreover, OCMT emphasises the alignment of strategic intent with organisational values and goals. This alignment is critical for ensuring that change initiatives are coherent and focused, as articulated in the McKinsey 7-S Model, which highlights the interdependence of strategy, structure, systems, shared values, style, staff, and skills (Waterman et al., 1980). When the strategic direction set by senior stakeholders aligns with the organisation's values, it fosters a cohesive and motivated workforce, enhancing the overall effectiveness of the change process.

Another significant advantage is the provision of structured frameworks. Models like Kotter's Eight-Step Change Model offer detailed steps for leaders to follow, including establishing a sense of urgency, creating a guiding coalition, developing a vision and strategy, and communicating the change vision (Kotter, 1995). These steps provide a clear roadmap for implementing change, facilitating step-by-step guidance that can be crucial for large and complex organisations.

OCMT also highlights the importance of readiness for change. Organisations can foster innovation and adaptation by creating a psychologically safe environment where employees can take risks and voice their opinions without fear of retribution (Edmondson, 1999). This psychological readiness is essential for ensuring that employees are willing and able to engage with the change process actively and positively.

### *Limitations of the OCMT*

Despite its advantages, OCMT has limitations. One of the primary challenges is its complexity. The multifaceted nature of the theory, which considers psychological, cultural, and operational aspects, can make it challenging to apply in practice, especially in large and diverse organisations (Burnes, 2004). This complexity requires a deep understanding of various models and principles and significant resources for implementation. Another limitation is the persistent issue of resistance to change. While the theory addresses strategies for overcoming resistance, such as effective communication and fostering psychological safety, deep-seated resistance can still be difficult and time-consuming (Kotter, 1995). Resistance can stem from various sources, including fear of the unknown, loss of control, and disruption of established routines, and addressing these concerns requires sustained effort and commitment from leadership.

Implementing change management strategies may demand significant resources, including time, money, and personnel. This resource intensity can be a barrier for organisations with limited financial or human resources (Hiatt & Creasey, 2012). Additionally, some change management models may not fully account for the dynamic and evolving nature of organisational environments, which can lead to challenges in adapting the models to real-world scenarios (By, 2005).

### *Value of the OCMT for this research*

Applying OCMT to implementing a new healthcare model in New Zealand offers several potential benefits. Firstly, the theory provides a systematic approach to identifying and addressing the critical enablers and barriers to implementing a new healthcare model. This thoroughness can help ensure the consideration and

addressing of all relevant factors, increasing the likelihood of successful implementation. Secondly, OCMT emphasises the role of senior stakeholders in driving change, which is crucial for gaining buy-in and support from all levels of the organisation. By aligning the strategic intent of senior stakeholders with the organisation's values and goals, the theory helps foster a cohesive and motivated workforce, which is essential for successful change.

The structured frameworks provided by OCMT can guide the implementation process, increasing the likelihood of successful adoption and integration of the new model. By following established steps and principles, organisations can navigate the complexities of change more effectively and efficiently. Finally, focusing on cultural and operational shifts ensures that changes are implemented and sustained over the long term. By fostering an environment of psychological safety and promoting open communication, organisations can ensure that employees are engaged and committed to the change process, enhancing overall adaptability and resilience.

### *Identifying critical enablers and barriers with OCMT*

To illustrate the practical application of OCMT, consider the example of identifying critical enablers and barriers to implementing a new healthcare model. Leadership commitment is a crucial enabler, as strong leadership from senior stakeholders can drive the change process and create a sense of urgency (Kotter, 1995). Effective communication is another critical enabler, as transparent and ongoing communication helps build trust, reduce uncertainty, and foster engagement (Smith, 1951). Creating an environment of psychological safety is also essential, as it empowers employees to take risks and voice their concerns, fostering innovation and adaptation (Edmondson, 1999).

Conversely, resistance to change is a significant barrier that can hinder the adoption of new models and practices (Kotter, 1995). Resource constraints, including limited financial, human, and technological resources, can impede implementation (Hiatt & Creasey, 2012). Cultural misalignment between the new model and the existing organisational culture can lead to resistance and reduced effectiveness (Schein, 2017). Technical challenges related to integrating new systems with existing infrastructure can create significant barriers to interoperability (Adler-Milstein & Jha, 2017).

### *Identifying the advantages and disadvantages of platform adoption with OCMT*

OCMT also provides valuable insights into the advantages and disadvantages of adopting a platform business model for healthcare provision in New Zealand. Platforms facilitate seamless information

exchange and coordination among healthcare providers, enhancing patient care and outcomes (Adler-Milstein & Jha, 2017; McDonald et al., 2014). By enabling the efficient sharing and allocation of resources, platforms ensure timely care from appropriate providers and optimise resource utilisation (Mehrotra et al., 2016). Platforms also foster ecosystem innovation and collaborative care, driving advancements in healthcare technologies and practices (Gawer & Cusumano, 2014; Samal et al., 2016). However, the centralised nature of platforms necessitates robust privacy and security measures to safeguard patient data, which can be a significant challenge (Dorsey & Topol, 2016). Healthcare providers may also face a learning curve when adopting and integrating new platform technologies, requiring considerable training and support (Mehrotra). Ensuring compliance with healthcare regulations and standards can be complex and resource-intensive, adding to the challenges of platform adoption (Dorsey).

### *Mapping OCMT to the research questions*

RQ1: What business model is best suited to delivering New Zealand's ideal healthcare system?

OCMT suggests that a platform business model might be well-suited to New Zealand's healthcare system. Platforms facilitate seamless information exchange and coordination among healthcare providers, enhancing patient care and outcomes (Adler-Milstein & Jha, 2017; McDonald et al., 2014). By enabling the efficient sharing and allocation of resources, platforms ensure timely care from appropriate providers and optimise resource utilisation (Mehrotra et al., 2016). Furthermore, platforms foster ecosystem innovation and collaborative care, driving advancements in healthcare technologies and practices (Gawer & Cusumano, 2014; Samal et al., 2016).

RQ2: What are the critical enablers and barriers to implementing such a business model?

Critical enablers identified through OCMT include leadership commitment, effective communication, and creating an environment of psychological safety. Strong leadership from senior stakeholders can drive the change process and develop a sense of urgency (Kotter, 1995). Transparent and ongoing communication helps build trust, reduce uncertainty, and foster engagement (Smith, 1951). Creating an environment of psychological safety empowers employees to take risks and voice their concerns, fostering innovation and adaptation (Edmondson, 1999). Conversely, significant barriers include resistance to change, resource constraints, cultural misalignment, and technical challenges. Resistance can stem from fear of the unknown, loss of control, and disruption of established routines, requiring sustained effort and commitment to overcome (Kotter). Limited financial, human, and technological resources can impede implementation (Hiatt & Creasey, 2012). Cultural misalignment between the new model and the existing organisational

culture can lead to resistance and reduced effectiveness (Schein, 2017). Technical challenges related to integrating new systems with existing infrastructure can create significant barriers to interoperability (Adler-Milstein & Jha, 2017).

RQ3: What can the relevant stakeholders do to address the barriers effectively?

To address barriers effectively, stakeholders should foster strong leadership and communication, invest resources, align cultural values, and address technical challenges. Leaders must communicate the vision and benefits of the new model clearly and consistently, creating a sense of urgency and engagement among employees (Kotter, 1995). Investing in training, technology, and infrastructure is crucial to overcoming resource constraints and technical challenges (Hiatt & Creasey, 2012). Ensuring the new model aligns with organisational values and culture can help reduce resistance and enhance effectiveness (Schein, 2017). Finally, fostering an environment of psychological safety can empower employees to embrace change and contribute to the innovation process (Edmondson, 1999).

By applying these principles, stakeholders can enhance the readiness of managers and the broader organisation for change, increasing the likelihood of successful implementation of a platform business model in New Zealand's healthcare system.

### 3.4.2. Health Policy and Governance Theory (HPGT)

Health Policy and Governance theory offers critical lenses through which the structure and policies surrounding data standards and integrated care platforms can be understood, particularly regarding their influence on national-level governance decisions around efficacy, equity, and overall direction.

Health Policy encompasses the decisions, plans, and actions undertaken to achieve specific healthcare goals within a society (Buse et al., 2012). It involves creating and implementing policies that govern the organisation, financing, and delivery of healthcare services. In the context of data standards and integrated care platforms, health policy plays a pivotal role in establishing the guidelines and regulations that ensure interoperability, data security, and privacy. Effective health policy can mandate the adoption of standardised data protocols across healthcare providers, facilitating seamless data exchange and integrated care delivery. This standardisation is crucial for creating a cohesive healthcare system where patient information can be readily shared across different platforms and providers, enhancing continuity of care and patient outcomes.

Governance refers to the processes and structures through which societies manage collective affairs, make decisions, and exercise power (Kickbusch & Gleicher, 2012). Healthcare governance involves the mechanisms, institutions, and processes that determine health policy development, implementation, and monitoring. Governance encompasses various stakeholders, including government agencies, healthcare providers, and civil society organisations, all of whom shape healthcare delivery and policy.

The structure and policies surrounding data standards and integrated care platforms significantly impact national-level governance decisions in several ways. First, they influence the alignment and coordination of healthcare services. National governance bodies must ensure data standards and integrated care platforms are compatible with healthcare infrastructure and policies. This requirement calls for comprehensive planning and coordination to avoid fragmentation and ensure all stakeholders align towards common goals (World Health Organization, 2016).

Secondly, robust data standards and integrated care platforms enable evidence-based policymaking. By providing accurate, timely, and comprehensive data, these systems allow policymakers to make informed decisions regarding resource allocation, public health interventions, and healthcare reforms. This data-driven approach enhances the accountability and transparency of governance processes to ensure the underpinning of decisions by empirical evidence rather than anecdotal information (Friedman et al., 2005).

Moreover, the implementation of integrated care platforms necessitates a re-evaluation of existing governance structures. Siloed approaches to healthcare governance are unlikely to be effective in an integrated care environment. National governance bodies must adapt by fostering collaborative governance models that involve multiple stakeholders, including patients, healthcare providers, and technology developers. This collaborative approach ensures consideration of diverse perspectives and policies more responsive to the population's needs (Shortell et al., 2010).

Finally, the policies surrounding data standards and integrated care platforms also have implications for equity and access to care. National governance decisions must consider how these policies affect populations, particularly marginalised and underserved communities. Ensuring equitable access to integrated care platforms and protecting patient data privacy are essential for fostering trust and participation in the healthcare system (Institute of Medicine, 2002).

In conclusion, Health Policy and Governance provide essential frameworks for understanding how the structure and policies around data standards and integrated care platforms impact national-level governance decisions. By facilitating alignment, enabling evidence-based policymaking, promoting collaborative

governance, and ensuring equity, these frameworks help create a more efficient, transparent, and responsive healthcare system.

### *Strengths of the HPGT*

Health Policy and Governance theory offers a structured approach to understanding the multifaceted aspects of data standards and integrated care platforms. The respective policy and governance frameworks integrate various elements, such as regulatory requirements, stakeholder roles, and strategic goals, providing a holistic view of how policies influence healthcare delivery (Buse et al., 2012). By promoting evidence-based policymaking, the frameworks also enhance the quality of decisions made at the national level. The availability of accurate and timely data supports effective resource allocation and public health interventions, leading to better health outcomes (Friedman & Parrish, 2010). The focus on equity and access ensures that healthcare policies benefit all segments of the population, particularly marginalised communities, promoting inclusivity and reducing health disparities (Institute of Medicine, 2002).

### *Limitations of the HPGT*

Implementing health policies and governance structures can be complex, often facing resistance from various stakeholders. Traditional practices and entrenched interests may hinder the adoption of new standards and collaborative models (Shortell et al., 2014). Effective governance and policy implementations also require significant financial, human, and technological investments if the development and enforcement of robust data standards and integrated care platforms are not to be impeded (Kickbusch & Gleicher, 2012). Despite the integration aim, the diversity of stakeholders and varying interests can lead to fragmented approaches that can undermine the coherence and effectiveness of national healthcare strategies (World Health Organization, 2016).

### *Value of the HPGT for this research*

Applying HPGT to implementing a new healthcare model in New Zealand offers several potential benefits. It can provide valuable insights into how specific policies impact the readiness for and implementation of integrated care platforms. It can identify best practices and possible pitfalls, guiding policymakers in crafting effective regulations and support structures. By examining governance models, the research can highlight strategies for fostering collaboration among diverse stakeholders and promote inclusive and effective governance, ensuring that all relevant perspectives are considered (Shortell et al., 2014). Finally, its focus on equity can drive the development of policies that ensure fair access to healthcare technologies

and services via innovative approaches that address disparities and promote an equitable healthcare system (Institute of Medicine, 2002).

### *Mapping HGPT to the research questions*

RQ1: What business model is best suited to delivering New Zealand's ideal healthcare system?

The insights gained from the Health Policy and Governance framework can inform the evaluation of different business models, particularly the Platform-Enabled Ecosystem model, by highlighting how policies and governance structures can support or hinder their implementation. By understanding the regulatory and structural requirements, the research can propose the most suitable business model that aligns with New Zealand's healthcare goals.

RQ2: What are the critical enablers and barriers to implementing such a business model?

This research can identify the key enablers, such as effective health policies and collaborative governance structures, that facilitate the adoption of integrated care platforms. Conversely, it can also pinpoint barriers, such as resistance to change and resource constraints, providing a comprehensive view of the challenges and opportunities in implementing the chosen business model.

RQ3: What can the relevant stakeholders do to address the barriers effectively?

By examining governance processes and stakeholder roles, this research can propose strategies for stakeholders to overcome barriers to implementation. These strategies can include fostering collaboration, advocating for policy changes, ensuring equitable access to technology, and enhancing the readiness for change across the healthcare system.

SQ1: What are the characteristics of the ideal New Zealand healthcare system?

The research can draw on Health Policy and Governance frameworks to outline the characteristics of an ideal healthcare system, focusing on interoperability, equity, and evidence-based policymaking. These insights can guide the design of a healthcare system that meets the diverse needs of New Zealand's population.

SQ2: How does the platform business model differ fundamentally from the pipeline business model concerning the dominant value creation logic?

The research can leverage governance insights to compare the platform and pipeline business models, particularly how they align with health policy goals and governance structures. Understanding these differences can clarify each model's dominant value creation logic and its implications for healthcare delivery.

SQ3: What are the advantages and disadvantages of adopting a platform business model for healthcare provision in New Zealand?

By evaluating the impacts of data standards and integrated care platforms, the research can assess the advantages, such as improved interoperability and evidence-based policymaking, and disadvantages, such as potential complexity and resource requirements, of adopting a platform business model. These insights can inform decision-making regarding adopting this model in New Zealand's healthcare system.

### 3.4.3. The Technology Acceptance Model (TAM)

Technology Acceptance frameworks, notably the Technology Acceptance Model (TAM), offer valuable insights into how patient attitudes towards technology can influence resource allocation in healthcare. TAM, developed by Davis (1989), provides a framework for understanding how users accept and use a technology. According to TAM, two primary factors determine technology acceptance: perceived usefulness (PU) and perceived ease of use (PEOU). These factors shape an individual's attitude toward using the technology, influencing their behavioural intention and actual usage behaviour (Davis).

Regarding attitude to technology, using the TAM model, perceived usefulness refers to the degree to which a person believes that using a particular technology will enhance their performance. In a healthcare context, this might translate to patients believing that a telehealth platform or electronic health record (EHR) system will improve the quality of their care or make accessing healthcare services more convenient. When patients perceive the high usefulness of a healthcare technology, they are more likely to have a positive attitude toward its adoption (Davis, 1989). Perceived ease of use is the degree to which a person believes that using the technology will be free of effort. For patients, this might involve the user-friendliness of a patient portal, the simplicity of scheduling appointments online, or the ease of understanding and navigating digital health tools. When patients find technology easy to use, their acceptance and willingness to engage with it increase (Venkatesh & Davis, 2000).

Patient attitudes towards technology, as explained by TAM, significantly impact healthcare resource allocation in several ways. When patients exhibit positive attitudes towards certain technologies, healthcare

organisations are more likely to allocate resources towards developing, implementing, and enhancing these technologies. For instance, if a significant portion of the patient population finds telehealth services valuable and easy to use, healthcare providers might invest more in expanding these services, ensuring robust digital infrastructure, and training staff to support them effectively (Karahanna & Limayem, 2000).

Similarly, understanding patient attitudes can inform resource allocation for training and support programs. If patients perceive technology to be helpful but challenging to use, healthcare organisations might allocate resources towards educational initiatives and support services to help patients better understand and use the technology. Assistance might include creating user-friendly guides and offering technical support and training sessions to enhance patient comfort and technological proficiency (Holden & Karsh, 2010).

Insights from TAM can also drive the design and development of patient-centred technologies. By allocating resources to gather patient feedback and incorporate their preferences, healthcare organisations can develop technologies that align more closely with patient needs and expectations. An iterative design process can lead to higher acceptance rates and more effective use of healthcare technologies, ultimately improving patient outcomes and satisfaction (Chau & Hu, 2002).

Ultimately, patient attitudes towards technology can influence healthcare policy and decision-making at various levels. Policymakers can use insights from TAM to prioritise funding and resources for technologies that demonstrate high perceived usefulness and ease of use among patients, leading to the development of policies that support the widespread adoption and integration of these technologies into the healthcare system, ensuring that resources are allocated efficiently and effectively (Bagozzi et al., 1992). Understanding variations in patient attitudes towards technology across different demographics can help healthcare organisations allocate resources that address disparities in technology access and use. For example, older patients or those from underserved communities may find certain technologies less valuable or more challenging. In that case, targeted interventions can bridge these gaps by investing in accessible technology, additional training, or policies to ensure equitable access to digital health tools (Chin & Gopal, 1995).

### *Strengths of the TAM*

Technology Acceptance Models (TAM) offer several advantages when applied to the context of healthcare resource allocation. The TAM has sound predictive validity, allowing healthcare organisations to anticipate patient acceptance of new technologies based on perceived usefulness and ease of use (Davis, 1989),

making it possible to make informed decisions regarding technology investments and implementation strategies.

The TAM ensures that developing and deploying healthcare technologies align with patient needs and preferences by focusing on patient attitudes and behaviours. This alignment can lead to higher satisfaction and better health outcomes (Venkatesh & Davis, 2000). Understanding patient attitudes towards technology through TAM can help optimise resource allocation. Organisations can prioritise investments in technologies likely to be accepted and used effectively by patients, thereby maximising the return on investment (ROI) (Karahanna & Limayem, 2000).

### *Limitations of the TAM*

The TAM primarily focuses on individual acceptance and use, potentially overlooking organisational and systemic factors that impact technology adoption. This scope can limit its applicability in complex settings (Legris et al., 2003). It is also often criticised for its static nature, not accounting for the dynamic and evolving nature of technology use over time when longitudinal studies are needed to capture changes in user perceptions and behaviours (Chau & Hu, 2002). The TAM may oversimplify the complex factors influencing technology acceptance and the user experience by focusing primarily on Perceived Usefulness and Perceived Ease of Use when factors such as social influence, individual differences, and contextual variables might also play significant roles (Benbasat & Barki, 2007; Venkatesh et al., 2012).

Furthermore, the TAM was developed and tested primarily in Western contexts, which may limit its generalisability to other cultural settings. Cross-cultural validations are necessary to ensure their relevance and applicability in diverse healthcare environments (Straub et al., 1997).

To summarise, the TAM provides a robust framework for understanding how patient attitudes toward technology influence resource allocation in healthcare. By considering perceived usefulness and ease of use, healthcare organisations can make informed decisions about investing in, implementing, and supporting technologies that align with patient needs and preferences. This patient-centred approach enhances technology adoption and effectively allocates resources to improve healthcare delivery and outcomes.

### *Value of the TAM for this research*

Incorporating the TAM into this research offers a robust framework for understanding how patient attitudes toward technology influence healthcare resource allocation and the selection of an appropriate business

model. By addressing the advantages, limitations, and potential value of TAM, this research can provide comprehensive insights into the critical factors shaping the future of New Zealand's healthcare system.

Insights from the TAM can also guide the development of targeted training and support programs, ensuring that patients have the necessary skills and confidence to use new technologies, thereby reducing resistance to adoption and improving overall technology utilisation (Holden & Karsh, 2010). TAM can also inform healthcare policy by highlighting which technologies are most valued by patients. Policymakers can allocate funding and resources more effectively, promoting the adoption of technologies that enhance patient care and system efficiency (Bagozzi et al., 1992).

### *Mapping the TAM to the research questions*

Applying the TAM to this research can provide valuable insights into the optimal business model for New Zealand's healthcare system and address the following research questions effectively:

RQ1: Best-Suited Business Model: By understanding patient attitudes towards healthcare technologies, TAM can help identify which business models (e.g., platform vs. pipeline) are more likely to be accepted and successful. For example, a platform model that integrates user-friendly and beneficial technologies might better meet patient needs and enhance healthcare delivery in New Zealand.

RQ2: Enablers and Barriers: TAM can highlight critical enablers (e.g., high perceived usefulness) and barriers (e.g., low ease of use) to technology adoption within different business models. This information can guide strategies to overcome the obstacles and enhance enablers, facilitating smoother implementation of the chosen business model.

RQ3: Addressing Barriers: Understanding the factors influencing patient acceptance of technology can help stakeholders develop targeted interventions to address barriers. For example, investing in user training and support programs can mitigate perceived ease of use issues, while improving technology features can enhance perceived usefulness.

SQ1: Characteristics of Ideal Healthcare System: TAM can inform the design of an ideal healthcare system by identifying the technological features and characteristics that patients value most, leading to developing a system more responsive to patient needs and preferences.

SQ2: Platform vs. Pipeline Models: The TAM can elucidate each model's dominant value creation logic by analysing how patient attitudes towards technology differ between platform and pipeline models. This understanding can guide the selection of the most appropriate model for New Zealand's healthcare system.

SQ3: Advantages and Disadvantages of Platform Model: TAM can provide empirical evidence on the benefits and challenges of adopting a platform business model in healthcare. Insights into patient acceptance can highlight the advantages (e.g., enhanced accessibility and coordination) and disadvantages (e.g., potential usability issues) of this model, informing decision-making processes.

### 3.4.4. Strategic management theories

Strategic management encompasses various theories and models that explore how organisations create and sustain competitive advantages, align resources with objectives, and navigate environmental uncertainties. Fundamental theories that elucidate the influence of organisational strategies on readiness for change include the *Resource-Based View*, *Dynamic Capabilities Theory*, *Resource Dependence Theory*, and the *Balanced Scorecard.* These frameworks can help explain how organisations formulate, implement, and evaluate strategies to achieve their goals and how these strategies affect their capacity to embrace and manage change:

#### *Resource-based View (RBV)*

The Resource-based View emphasises that an organisation's internal resources and capabilities are crucial to its strategic success (Barney, 1991). Organisations with valuable, rare, inimitable, and non-substitutable resources are well-positioned to achieve sustainable competitive advantages. These resources can include tangible assets, such as technology and infrastructure, and intangible assets, such as knowledge, skills, and organisational culture. RBV suggests that organisations with advanced technological infrastructure and skilled workforces are better equipped to undertake and manage change initiatives in the context of readiness for change. The presence of robust resources facilitates the smooth transition from existing processes to new ones, reducing resistance and increasing the likelihood of successful change implementation (Wernerfelt, 1984).

For example, regarding RQ1: When evaluating which business model is best suited to deliver New Zealand's ideal healthcare system, the RBV suggests that the model should leverage existing internal resources. For instance, if a platform-based model is considered, its successful implementation would

depend on the organisation's existing technological infrastructure and skilled workforce. The RBV supports choosing a model that maximises using these internal strengths.

### *Dynamic Capabilities Theory (DCT)*

Dynamic Capabilities Theory extends the RBV by focusing on an organisation's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece et al., 1997). The DCT posits that organisations must continuously develop dynamic capabilities to sense opportunities and threats, seize opportunities, and maintain competitiveness.

Readiness for change has links to an organisation's dynamic capabilities to quickly adapt to changing circumstances, innovate, and reconfigure its resources. For instance, healthcare organisations that actively monitor technological advancements, invest in employee training, and foster an innovation culture will be better prepared to adopt new healthcare practices and technologies. Dynamic capabilities enable organisations to remain agile and responsive, enhancing their readiness for change (Eisenhardt & Martin, 2000).

For example, regarding RQ2, Dynamic Capabilities Theory can inform the identification of critical enablers and barriers to implementing a new business model, such as a platform model. Enablers might include the organisation's ability to rapidly adapt to new technologies and continuously innovate, while barriers could involve limitations in existing dynamic capabilities or resistance to change.

### *Resource Dependence Theory (RDT)*

Resource Dependence Theory posits that organisations are not autonomous entities but interdependent with their external environment, including other organisations, institutions, and stakeholders (Pfeffer & Salancik, 1978). RDT highlights that organisations require external resources, such as financial capital, human resources, information, and technology, to function effectively. This interdependence means organisations must strategically manage their external relationships to secure necessary resources and reduce vulnerabilities.

In the context of readiness for change, RDT suggests that healthcare organisations must manage their dependencies on external entities to facilitate change. For example, a healthcare organisation transitioning to a platform-based model may need to form strategic partnerships with technology firms to secure the necessary expertise and resources. By understanding and managing these dependencies, organisations can enhance their readiness for change (Hillman et al., 2009).

For example, regarding RQ3**:** Addressing barriers to implementing a new business model, such as securing external resources and partnerships, aligns with RDT. Effective strategies might include negotiating alliances with technology providers to overcome resource constraints and manage dependencies that could hinder the transition.

*Balanced Scorecard (BSC)*

The Balanced Scorecard is a strategic management tool that translates an organisation's vision and strategy into a coherent set of performance measures across four perspectives: financial, customer, internal processes, and learning and growth (Kaplan & Norton, 1992). The BSC helps organisations align their activities with their strategic objectives and monitor progress towards achieving these goals.

Regarding readiness for change, the BSC provides a structured framework for identifying and addressing areas that require improvement. By regularly assessing performance across the four perspectives, organisations can identify gaps and develop targeted strategies to enhance their readiness for change. For example, if an organisation needs improved internal processes to support new technologies, it can allocate resources to process optimisation and employee training. The BSC ensures that all aspects of the organisation are aligned with the strategic goals, facilitating a more coordinated, practical approach to change (Niven, 2006).

For example, regarding SQ1: By identifying key performance indicators across financial, customer, internal processes, and learning and growth perspectives, the BSC approach can guide the characteristics of the ideal New Zealand healthcare system and provide the needed alignment between strategic goals and operational execution in healthcare delivery.

### *Strengths of Strategic Management Theories*

Applying strategic management theories to understanding readiness for change in healthcare organisations offers several significant advantages.

#### Enhanced organisational competence

The Resource-Based View (RBV) highlights the importance of leveraging internal resources and capabilities. This approach ensures that healthcare organisations effectively utilise their valuable, rare, inimitable, and non-substitutable resources, leading to sustainable competitive advantages and improved readiness for change (Barney, 1991).

### Agility and responsiveness

Dynamic Capabilities Theory (DCT) emphasises the importance of integrating, building, and reconfiguring competencies to address changing environments. This theory helps healthcare organisations develop the agility needed to adapt to new technologies and practices swiftly, enhancing their readiness for change (Teece et al., 1997).

#### Managing external dependencies

Resource Dependence Theory (RDT) offers a framework for understanding and managing an organisation's dependencies on external resources. This perspective is crucial for healthcare organisations transitioning to new business models that rely on external partnerships and resources, such as technology providers (Pfeffer & Salancik, 1978).

#### Comprehensive performance measurement

The Balanced Scorecard (BSC) provides a holistic framework for assessing organisational performance across multiple dimensions. This structured approach ensures that all aspects of the organisation are aligned with strategic objectives, facilitating a coordinated and practical approach to change (Kaplan & Norton, 1992).

### *Limitations of Strategic Management Theories*

Despite their advantages, there are limitations to applying strategic management theories to healthcare organisations.

#### Complexity and overload

Applying multiple strategic management theories can complicate organisational decision-making, overwhelm managers, and hinder the effective implementation of change (Burnes, 2004).

### Resource constraints

While the RBV and DCT emphasise resource importance, many healthcare organisations face significant constraints. Limited financial, human, and technological resources can impede the ability to build and sustain necessary capabilities (Wernerfelt, 1984).

**Measurement challenges**

Implementing the Balanced Scorecard (BSC) requires rigorous data collection and analysis. Many healthcare organisations may struggle with the necessary infrastructure and expertise to effectively measure and interpret performance across all dimensions (Niven, 2006).

**Resistance to change**

Organisational culture and resistance to change can significantly hinder the implementation of strategic initiatives. Even with strong leadership and communication, deeply ingrained resistance can pose a significant barrier to readiness for change (Burnes, 2004).

**Short-term focus**

While strategic management theories often emphasise long-term goals and sustainability, healthcare organisations may feel pressured to address immediate challenges and short-term goals, potentially compromising their ability to invest in long-term readiness for change (Prahalad & Hamel, 2009).

### *Value of Strategic Management Theories for this Research*

Applying strategic management theories to this research can significantly enhance our understanding and help to address the research questions effectively.

### *Mapping Strategic Management Theories to the Research Questions*

RQ1: Best-Suited Business Model: Strategic management theories, particularly the RBV and Dynamic Capabilities Theory, suggest that the best-suited business model for delivering New Zealand's ideal healthcare system should leverage existing resources and capabilities while ensuring agility and adaptability. For instance, adopting a platform-based model may be advantageous if the healthcare organisation already possesses or can quickly develop the necessary resources and dynamic capabilities.

RQ2: Critical Enablers and Barriers: The RBV and Dynamic Capabilities Theory can help identify critical enablers, such as advanced technology and skilled personnel, and barriers, such as resource constraints and resistance to change. Understanding these factors enables organisations to address the obstacles and enhance readiness for change by strategically managing their internal and external resources.

RQ3: Addressing Barriers: The Balanced Scorecard and RDT provide insights into how organisations can address barriers effectively. By aligning strategic objectives with performance measures and managing external dependencies, organisations can overcome challenges related to implementing new business models and enhance their readiness for change.

### *Aligning Organisational Vision and Goals*

By integrating strategic management theories, healthcare organisations can develop a comprehensive approach to change, ensuring they are well-prepared to adopt and manage new business models effectively.

Organisational strategies aligned with the organisation's vision and goals create a sense of purpose and direction. This alignment helps employees understand the rationale behind change initiatives and their role in achieving organisational objectives. When strategies are well-communicated and aligned with the organisation's mission, it fosters a culture of readiness for change (Kotter, 1995).

RQ1: Best-Suited Business Model: A healthcare organisation aiming to adopt a platform-based business model can use strategic alignment to ensure that all stakeholders understand its benefits, such as improved patient care and operational efficiency. Aligning the platform model with the organisational vision makes the transition more cohesive and purpose driven.

### *Resource Allocation and Capability Building*

Strategic management involves allocating resources to areas supporting the organisation's objectives. By investing in the development of critical capabilities, such as technology, skills, and processes, organisations can enhance their readiness for change. Strategic resource allocation ensures the necessary tools and support are available to facilitate change (Prahalad & Hamel, 2009).

RQ2: Critical Enablers and Barriers: In a healthcare organisation adopting a new business model, critical enablers such as advanced IT infrastructure and staff training are essential. By strategically allocating resources to these areas, the organisation can overcome barriers such as resistance to new technologies or processes.

### *Change Leadership and Management*

Effective strategic management requires strong leadership to drive change initiatives. Leaders play a crucial role in communicating the vision, motivating employees, and managing resistance to change.

Organisational strategies that emphasise leadership development and change management practices are more likely to succeed in preparing the organisation for change (Burnes, 2004).

RQ3: Addressing Barriers: Strong leadership can address resistance to a new business model in a healthcare organisation by clearly communicating the benefits of the change, involving key stakeholders in the decision-making process, and providing support throughout the transition.

*Continuous Improvement and Innovation*

Strategies that prioritise continuous improvement and innovation create an environment conducive to change. Organisations can build the resilience and adaptability needed to navigate change by fostering a culture of experimentation and learning. Strategic initiatives encouraging innovation and learning help organisations stay ahead of industry trends and enhance their readiness for change (Darwin, 2017).

RQ3: Addressing Barriers: A healthcare organisation considering the platform model can benefit from a strategic focus on continuous improvement. For instance, by regularly evaluating the platform's performance and incorporating user feedback, the organisation can refine the model to better meet the needs of patients and providers, thereby enhancing overall effectiveness.

### 3.4.5. Stakeholder Theory (ST)

In healthcare transformation, particularly in the shift from a pipeline to a platform model, Stakeholder Theory emerges as an invaluable framework. This theory is pivotal because it provides a robust framework for understanding the complex network of relationships, interests, and power dynamics within healthcare systems (Freeman, 1984; Mitchell et al., 1997). Stakeholder Theory emphasises the importance of identifying and engaging various stakeholders—patients, healthcare providers, policymakers, and technology firms—whose interests and influence can significantly impact the transformation process (Eisenhardt et al., 2000). By selecting this framework, the research acknowledges the necessity of integrating diverse stakeholders' perspectives, aligning their interests, and managing their expectations to effectively facilitate the transition to a platform-based healthcare model. This approach ensures that the transformation process is inclusive, addresses the needs and concerns of all relevant parties, and leverages their contributions for successful implementation (Donaldson & Preston, 1995; Jones et al., 2017).

Stakeholder Theory provides direction on how managers function by taking the needs of other people involved in the system into account rather than merely addressing their own needs (Freeman, 1984). Stakeholders are “the ensemble of parties that can affect the company or who can be affected by it”

(Freeman, p. 46). Stakeholder theorists propose different categories of stakeholders: voluntary and involuntary (Clarkson, 1995), primary or secondary (Carroll, 1979), and strategic or moral (Goodpaster, 1991). These actors can be formally or informally involved in the company. It is convenient to analyse stakeholders who are active or potential, those who are affected by the company, and those influencing it.

Although Stakeholder Theory has roots in and pertains to private-sector organisations, there is tremendous interest in applying at least part of the findings to managerial decision-making in public-sector organisations (Schnoll, 2015). Some proponents of Stakeholder Theory are extremely sceptical regarding this undertaking, stating that inter- and intra-governmental decision processes may benefit from applying stakeholder principles, which seems particularly true regarding large-scale investments in information technology, where the risk of failure is high (Schnoll). Stakeholder Theory was a potentially suitable lens for considering how managers consider other people's needs rather than merely addressing their own.

Stakeholder Theory is a multifaceted framework pivotal in understanding healthcare transformation's intricacies, particularly in transitioning from traditional pipeline models to innovative platform-based systems. This theory serves as a guiding compass for comprehending the complex interplay of interests, relationships, and responsibilities among diverse stakeholders in the healthcare ecosystem (Freeman, 1984; Mitchell et al., 1997).

*Strengths of ST*

Stakeholder Theory offers several advantages when applied in the context of healthcare transformation:

- **Comprehensive Analysis:** It provides a comprehensive framework for understanding the multifaceted nature of stakeholder relationships and interests, allowing for a holistic assessment of enablers and barriers by identifying the diverse actors involved and their respective influences (Donaldson & Preston, 1995; Jones et al., 2017).
- **Collaboration Facilitation:** The theory encourages stakeholder collaboration and engagement, fostering a more inclusive and cooperative approach to healthcare transformation. It encourages aligning interests and building partnerships necessary for successful change (Eisenhardt et al., 2000; Mitchell et al., 1997).
- **Ethical Alignment:** Stakeholder Theory aligns with moral principles, ensuring that the transformation process considers ethical considerations and prioritises the well-being of all stakeholders. This approach supports equitable access and patient-centred care by emphasising the importance of moral decision-making (Freeman, 1984; Jones et al., 2006).

### *Weaknesses of ST*

While valuable, Stakeholder Theory does have certain limitations:

- **Complexity**: Analysing the interests and dynamics of numerous stakeholders can be complex and resource-intensive, demanding a comprehensive understanding of each stakeholder's context and motivations (Freeman, 1984; Mitchell et al., 1997).
- **Subjectivity:** Stakeholder interests and power dynamics are often subjective and may evolve, requiring ongoing analysis and adaptation (Donaldson & Preston, 1995; Jones et al., 2017).

### *Value of ST for this research*

Healthcare, as a dynamic and evolving domain, inherently involves many stakeholders, each with distinct roles, interests, and expectations. Stakeholder Theory recognises and addresses this multifaceted landscape. It posits that organisations, including healthcare entities, exist not in isolation but within a network of stakeholders who significantly influence and are influenced by organisational decisions and actions (Mitchell et al., 1997).

The healthcare sector's ongoing paradigm shift towards platform-based models emphasises the need for a holistic understanding of stakeholder dynamics. In pursuing equitable access, patient-centred care, and enhanced integration of services and resources, Stakeholder Theory stands as an intellectual scaffolding upon which researchers, policymakers, and healthcare leaders can construct strategies, navigate challenges, and cultivate collaborative ecosystems (Donaldson & Preston, 1995; Jones et al., 2017).

Stakeholder Theory posits that organisations exist within a network of stakeholders, and their actions should serve the interests of these stakeholders. In healthcare, these stakeholders encompass a broad spectrum, ranging from patients and healthcare providers to government bodies, technology vendors, insurers, and the wider community (Freeman, 1984). The framework examines how each stakeholder group affects and is affected by the transition from a pipeline to a platform-based healthcare system. Here, we elucidate the significance of Stakeholder Theory through its application to the following research questions:

*Mapping of ST to the research questions*

RQ1: Best-Suited Business Model:

- **Stakeholder Mapping:** Stakeholder Theory aids in the identification and mapping of key stakeholders in New Zealand's healthcare ecosystem. It involves recognising the interests, concerns, and influence of entities such as patients, healthcare providers, government agencies, technology vendors, insurers, and community organisations (Freeman, 1984; Mitchell et al., 1997).
- **Stakeholder Interest Alignment:** The framework facilitates an in-depth examination of stakeholder interests. For instance, patients may desire improved access and personalised care, while technology vendors may seek opportunities in digital healthcare solutions. Stakeholder Theory helps uncover areas of alignment and potential conflict among these interests (Donaldson & Preston, 1995; Jones et al., 2017).
- **Power Dynamics:** Understanding the power dynamics within the healthcare system is crucial when analysing enablers and barriers. Stakeholder Theory allows for examining who holds influence and authority in decision-making processes related to the platform-based transformation. It helps identify the key actors, including government bodies, healthcare providers, and influential technology vendors, and how their power and interests shape the direction of healthcare innovations (Freeman, 1984; Phillips et al., 2003).
- **Value Creation Analysis:** Stakeholder Theory aids in the comprehensive analysis of how value creation logics diverge between pipeline and platform models. It considers how value is generated and distributed and how these dynamics affect stakeholders. For instance, the platform model often focuses on value co-creation through networked interactions, contrasting with the linear value creation of pipeline models (Eisenmann et al., 2011; Porter & Millar, 1985). In addressing SQ1 regarding the fundamental differences in value creation logic between pipeline and platform models, Stakeholder Theory is instrumental in understanding how these shifts resonate with different stakeholder groups.
- **Stakeholder Impact Assessment:** This theory also facilitates an assessment of how shifts in value creation logic impact various stakeholder groups. For example, patients may benefit from the platform model's emphasis on personalised care, while healthcare providers may need to adapt to new reimbursement structures. Stakeholder Theory allows for examining how these changes align with the interests and concerns of each stakeholder category, such as how patient-centric models might influence patient satisfaction and provider workflows (Donaldson & Preston, 1995; Freeman, 1984).

- **Understanding Dominant Value Creation Logics (SQ1):** In the traditional pipeline model, value creation often follows a linear path where healthcare providers offer services directly to patients. In contrast, the platform model facilitates value co-creation through interactions between patients and providers, enabling a more integrated and efficient service delivery system. Stakeholder Theory helps analyse how this shift aligns with the interests of healthcare providers, insurers, and patients, providing insights into who stands to gain the most from this new value-creation logic and how these stakeholders might be affected by the change (Eisenmann et al., 2011; Porter & Millar, 1985).

RQ2: Critical Enablers and Barriers:

- **Identifying Critical Enablers and Barriers:** When transitioning to a platform-based model, a critical enabler identified through Stakeholder Theory might be the alignment of interests between government agencies and technology vendors. Government agencies may see an opportunity to enhance healthcare delivery, while vendors may find a growing market for their digital solutions. Conversely, a barrier could be resistance from some healthcare providers who are hesitant to embrace digital changes due to concerns about data security or workflow disruptions (Freeman, 1984; Mitchell et al., 1997).

The presented examples illustrate how stakeholder theory and other theories can help address the research questions related to transforming the healthcare system in New Zealand from a pipeline to a platform model. Stakeholder Theory was chosen as the primary lens due to its alignment with collaboration and shared value creation. It is worth noting the possibility that the findings might change if Resource Dependence Theory were the primary lens, due to RDT's emphasis on power dynamics and external dependencies rather than multi-actor collaboration in healthcare transformation.

Dissecting the complex web of relationships and interests guides stakeholders in collaboratively addressing critical enablers and barriers. By recognising the interdependence of the various actors and aligning their motivations, effective navigation of the transition toward a platform-based model that fosters equitable, patient-centred, and technologically driven care should be possible.

# Chapter 4: Research Methodology and Design

## 4.1. Introduction

This chapter serves as the methodological compass guiding the trajectory of this scholarly investigation. Its purpose is to delineate the systematic framework employed to address the research questions, acquire data, and extract meaningful insights. By signifying a meticulous and strategic approach, this chapter forms a cornerstone in ensuring this research endeavour's rigour, credibility, and validity. Chapters 5 and 6 detail the Delphi and semi-structured interview data collection and analysis.

## 4.2. Elements of the research process

Crotty (1998) presents four essential elements of a research process, which are closely related and inform one another: epistemology, theoretical perspective, methodology, and methods. Hence, the research process considers assumptions about reality, knowledge, values, and research practice.

Assumptions about the process of knowing and creating knowledge and how we view the world justify the intended research approach. These assumptions relate to "the nature of reality (ontology), how we know what we know (epistemology), the role of values (axiology), the language of research (rhetoric), and the methods used in the research process (methodology)" (Creswell, 2007, p. 17).

Table 4.1 presents the representative sampling contained within each category. Daniel and Harland (2018) discuss ontology and epistemology as theoretical levels of abstraction that guide researchers towards maintaining a balance of logic and rigour throughout the research process.

**Table 4.1. Representative sampling of each category**

| Epistemology | Theoretical perspective | Methodology | Methods |
|---|---|---|---|
| Objectivism | Positivism (and post-positivism) | Experimental research | Sampling |
| Constructionism | | Survey research | Measurement and scaling |
| Subjectivism | Interpretivism | Ethnography | Questionnaire |
| (*and their variants*) | ➢ Symbolic interactionism | Phenomenological research | Observation |
| | ➢ Phenomenology | | ➢ Participant |
| | ➢ Hermeneutics | Grounded theory | ➢ Non-participant |
| | ➢ Critical Inquiry | Heuristic inquiry | Interview |
| | ➢ Feminism | Action research | Focus group |
| | ➢ Postmodernism | Discourse analysis | Case study |
| | … | Feminist standpoint research | Life history |
| | | | Narrative |
| | | ... | Visual ethnographic methods |
| | | | Statistical analysis |
| | | | Data reduction |
| | | | Theme identification |
| | | | Comparative analysis |
| | | | Cognitive mapping |
| | | | Interpretative methods |
| | | | Document analysis |
| | | | Content analysis |
| | | | Conversion analysis |
| | | | … |

Source: Crotty (1998)

Grix (2002) proposes that ontology is foundational to epistemology and both direct the researcher towards data sources and methods. In other words, the researcher's values and how they see the world are essential to how knowledge is understood and the process for producing it (Grix). Figure 4.1 presents the interrelationships between each category.

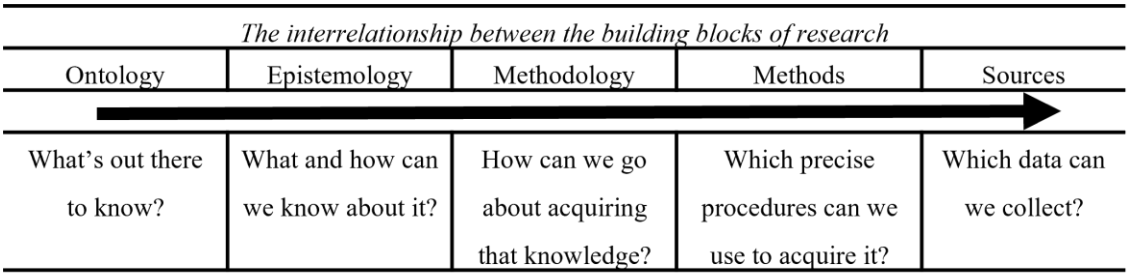



**Figure 4.1. The building blocks of research**

Source: Grix (2002)

## 4.3. Research paradigms

A paradigm is the researcher's worldview and includes three elements: epistemology, ontology and methodology (Crotty, 1998). Researchers can select a paradigm that suits their purposes by linking research paradigms into a correlating ontology and epistemology (Daniel & Harland, 2018). Five paradigms, with associated ontology and epistemology, are presented in Table 4.2.

**Table 4.2. Paradigms with associated ontology and epistemology**

| ***Paradigm*** | ***Ontology*** | ***Epistemology*** |
|---|---|---|
| Positivism | An objective test of reality | Testable theories of knowledge |
| Critical realism | An objective reality that may not be testable | Individual understanding of reality |
| Interpretive | Reality created by the individual | Knowledge unique to the individual |
| Critical theory | Reality is socially constructed, and interested | Knowledge and power are inseparable |
| Pragmatism | Reality is driven by experience | Knowledge needs to have utility |

Source: Adapted from Grix (2002)

## 4.4. Epistemological stance

Epistemology is a way of understanding and explaining how we know what we know, significantly impacting how research is conducted (Crotty, 1998). It concerns what is (or should be) regarded as adequate knowledge in a discipline (Bryman & Bell, 2011). There are three common epistemological stances for qualitative inquiry: objectivist, constructionist, and subjectivist (Crotty). Objectivism holds that meaningful reality exists apart from the operation of any consciousness of 'what it means to know' and that researchers can discover the objective truth.

Constructionism posits that truth or meaning emerges through our engagement with our world realities, where meaning is not discovered but constructed (Crotty, 1998). Schwandt (1994, p. 125) states that constructivists "are deeply committed to the contrary view that what we take to be objective knowledge and truth is the result of perspective". Constructivists, he adds, "emphasise the instrumental and practical function of theory construction and knowing". Subjectivism focuses on meaning being created from nothing and imported from somewhere else. Crotty states that subjective meaning arrives from anything but an interaction between the subject and the object.

Morrow (2009, p. 70) describes epistemic access as "*Gaining access, thus, was learning how to become a participant in practice, and since academic practices have developed around the search for knowledge, access to an academic practice entailed epistemological access."*

This thesis encapsulates the epistemological assumptions in the interpretivism worldview (theoretical perspective).

## 4.5. Theoretical perspective

The three philosophical bases of research studies are positivism, interpretivism and critical realism (Crotty, 1998). Positivism relies on the natural sciences and the study of natural reality (Bryman & Bell, 2011). It assumes observable social reality and researcher independence, with neither affecting nor being affected by the research subject and universal laws (Cavana et al., 2001). Positivism contains elements of both a deductive approach to reasoning and an inductive strategy (Bryman). Research methods used under this philosophy include experiments, secondary data and questionnaires. Data analysis utilises quantitative methods, measuring the research quality using internal and external validity and reliability (Cavana).

Interpretivist researchers assume a social construction of reality while recognising the world's complexity. Yet they still acknowledge that its unique nature and dynamism create difficulty in arriving at universal rules that focus on socially constructed reality understood by an individual or group (Cavana et al., 2001). Interpretivism is the most suitable philosophical foundation for this thesis. This base combines an interpretivist epistemology with qualitative research design elements to underpin the research inquiry.

## 4.6. Proposed methodology

The research methodology explains the research strategy or action plan (Crotty, 1998). Figure 4.2 depicts a honeycomb of research methodology comprised of six elements, where the three highlighted elements of research connect with three other segments to define the research methodology (Wilson, 2014).

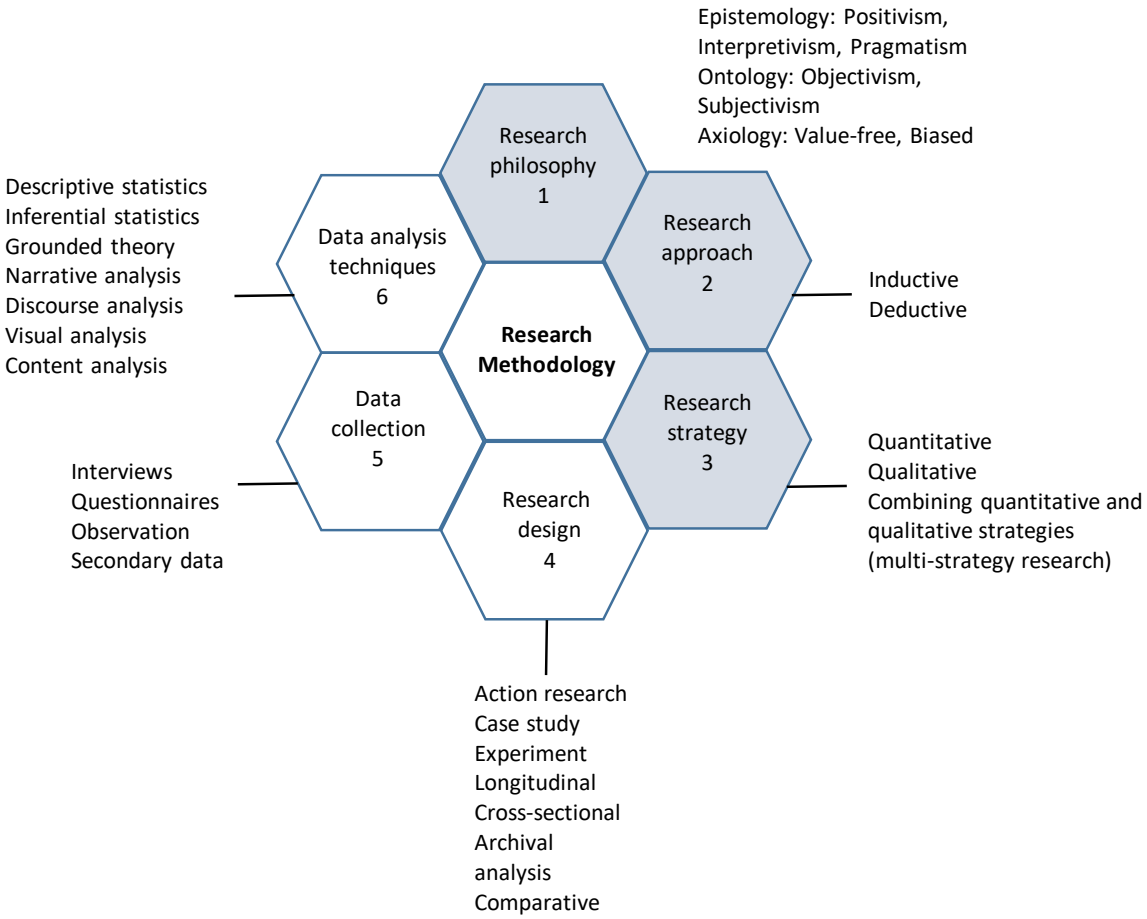



**Figure 4.2. Research methodology 'honeycomb'**

Source: Wilson (2014)

The 'honeycomb' presents a clear, numbered research methodology structure that allows the researcher to see the flow of elements and descriptions of disciplines within each component, combining to make up the central research methodology (Wilson, 2014). The research methodology explains the research strategy or action plan (Crotty, 1998). Qualitative methodology analyses and interprets personal narratives and participants' experiences (Sharts-Hopko, 2002). It involves exploring, describing, explaining and understanding the human condition (Daniel & Harland, 2018). Qualitative research captures participants' richness, context, and subjective experiences, often using interviews, observations, and content analysis (Cavana et al., 2001).

In contrast, quantitative methodology is concerned with systematically collecting, analysing, and interpreting numerical data to understand patterns, relationships, and trends within a specific research context (Creswell, 1994). Its emphasis is on objective measurement, statistical analysis, and quantification

of variables (Creswell, 2009). Quantitative research aims to generalise findings to a larger population, often using structured surveys, experiments, or statistical analyses to test hypotheses and draw conclusions based on empirical evidence (Cavana et al., 2001).

Methodologically speaking, this study is empirical research that combines empirical social science methods with philosophical theory using an interpretivist approach. It adopts an interpretivist epistemology that is abductive and qualitative in its foundations (Creswell, 2009). The research design is a multi-method, qualitative study, and qualitative research design. It utilises several data collection techniques (Saunders et al., 2015), including semi-structured interviews, secondary data collection, and thematic content analysis. Figure 4.3 summarises the methodological framework for this study.

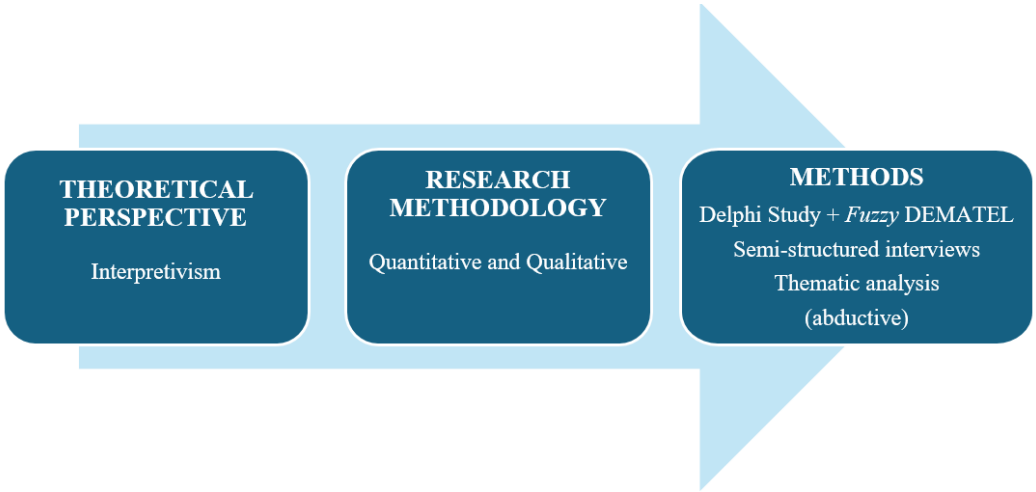



**Figure 4.3. Research design**

Source: The Author

## 4.7. Research methods

Research methods are the techniques or procedures used to gather and analyse data (Crotty, 1998). A multi-method qualitative study incorporates a qualitative research design that may utilise more than one data collection technique (Saunders et al., 2015) in which the different collected data types provide cross-data validity checks and ensure triangulation of the data (Wilson, 2014). There are four principal methods of data collection. Interviews are the most common method and yield a rich source of data. Focus groups facilitate discussion and collaboration but risk groupthink and dominant/submissive behaviours (Crotty). Questionnaires are instruments for collecting qualitative data that measure social and behavioural occurrences but risk low response rates, long collection duration and question development. Finally, observational methods are the most common in educational psychology (Daniel & Harland, 2018).

Table 4.3 compares the more common research methods. Observation involves systematically watching and recording behaviours or events in their natural setting, which is valuable for studying behaviours that might be difficult to capture through other means, like body language or environmental interactions (Yin et al., 2018). However, the presence of an observer can influence behaviour, potentially leading to observer bias (Rosenbaum et al., 2010). Additionally, observations might not capture underlying motivations or thoughts (Creswell, 2014).

Surveys efficiently collect data from large numbers of participants. They offer standardised data that can be analysed quantitatively, providing valuable insights into trends and correlations (Fink, 2013). However, the data collected might lack depth and context, and respondents could give socially desirable answers or misunderstand questions (Dillman et al., 2014).

Interviews provide an opportunity to delve deeply into participants' perspectives, feelings, and experiences. Their flexibility allows researchers to explore complex topics and follow up on specific points (Seidman, 2013). However, interviews can be time-consuming, and interviewer bias may be present (Kvale & Brinkmann, 2015). The rapport between interviewer and interviewee can significantly impact the quality of the data collected (Patton, 2002).

Focus groups involve a small group of participants discussing a specific topic under the guidance of a moderator. This method leverages group dynamics to generate insights and explore varying viewpoints (Krueger & Casey, 2015). Managing group interactions can be challenging, and dominant voices might overshadow others (Morgan et al., 1998). Additionally, findings from focus groups may not be broadly applicable beyond the specific group (Hennink et al., 2020).

Case studies offer an in-depth examination of a single entity, an individual, a group, an organisation, or a community. While they are beneficial for exploring unique or complex situations (Yin et al., 2018), findings might not be generalisable to broader contexts (Stake, 1995), and researcher bias could affect data interpretation (Eisenhardt, 1989).

**Table 4.3. (Primary) research methods**

| Method | Advantages | Disadvantages |
|---|---|---|
| Observation | Insights into real-world behaviour with minimal interference in the natural setting aid the study of non-verbal phenomena | Observer bias, limited to observational behaviours, and lack of control over variables |
| Questionnaire survey | Efficient when collecting data from a large sample, standardised data collection, and easy to analyse quantitatively | Limited depth of responses, potential for response bias, difficulty in ensuring honest and accurate responses |
| Interview | Provides in-depth understanding, flexibility to explore complex topics, and the ability to clarify responses. Personal rapport can enhance the data quality | Time-consuming, potential interviewer bias, limited sample size compared to surveys, potential for social desirability bias in responses |
| Focus group | Group dynamics can stimulate focused discussions, diverse perspectives and rapid data collection | Potential for dominant voices to steer discussions, challenging to manage group dynamics, limited generalisability of findings |
| Case study | In-depth understanding of a phenomenon, valuable for rare/complex cases, multiple data sources for triangulation | Limited generalisability and the potential for researcher bias in selecting and interpreting data. Also, time-consuming |
| Experiment | High level of control over variables, establishment of cause-and-effect relationships, and replicability | Artificial settings might not reflect real-world complexities, and demand characteristics can affect behaviour; potential ethical concerns |
| Survey (Online and Offline) | Efficient data collection, easy to administer, and potential for anonymity in online surveys | Limited depth of responses, potential for self-selection bias, challenges in reaching specific demographics |
| Content Analysis | Systematic analysis of textual or visual data can reveal trends | Labour-intensive, potential subjectivity in coding and interpretation |
| Ethnography | In-depth cultural understanding, immersion in the research context, and uncovering implicit behaviours and values | Time-consuming, potential for researcher bias, difficulty in maintaining objectivity, limited generalisability |
| Action Research | Collaborative problem-solving, direct application of findings to real-world issues, engagement with stakeholders | Balancing research rigour with practicality, potential for bias due to close involvement, challenges in maintaining objectivity |

Source: The Author

Experiments involve manipulating variables to establish cause-and-effect relationships. This method provides a high level of control, making it possible to isolate the effects of specific factors (Campbell & Stanley, 2015). However, the controlled environment might not entirely reflect real-world complexities (Cook et al., 1979), and ethical considerations must be considered (Zimbardo, 2007).

Surveys are versatile methods for collecting data from many respondents. Online surveys offer convenience, while offline surveys might reach specific populations (Creswell, 2014). Nevertheless, both forms of surveys might suffer from response bias, leading to skewed results. Reaching diverse demographic groups in online surveys can be challenging (Fink, 2013).

Content analysis, commonly used in media and communication studies, involves systematically analysing textual, visual, or audio content to identify patterns and trends (Krippendorff, 2018). However, the interpretation of content can be subjective, and the method might not capture underlying motivations or contextual nuances (Lune & Berg, 2017).

Ethnography involves immersing oneself in the research context to understand a group's culture, behaviours, and perspectives (Geertz, 1973). It is ideal for studying cultural phenomena but is time-intensive and requires careful consideration to avoid biases introduced by the researcher's subjectivity (Hammersley & Atkinson, 2019).

Action research focuses on solving real-world problems collaboratively with stakeholders (Reason & Bradbury, 2008). While valuable for practical applications, maintaining objectivity while actively participating can be challenging (Lewin, 1946). Balancing academic rigour with practicality is crucial in this approach (McNiff, 2017).

Given that this was an exploratory empirical study, the primary data collection methods judged appropriate were a (Delphi) questionnaire survey followed by interviews, as the aim was to have the Delphi findings inform the choice of (semi-structured) interview questions. Existing data were also collected from secondary sources (Wilson, 2014), primarily electronic academic journals, conference papers and books (Wilson).

Thus, the overall research design for this study involved two phases:

- Phase 1: a Delphi survey to uncover the primary issues and driving factors and confirm the most promising theoretical lenses
- Phase 2: interviews to fully understand the factors developed during the Delphi survey.

## 4.8. Research phase 1: Delphi study

The study aims to investigate the perceived obstacles and enablers to transforming New Zealand's traditional pipeline model of healthcare provision, which is a complex and subjective phenomenon. Qualitative research methods are best suited for this kind of exploratory research, which involves an in-depth understanding of subjective experiences, attitudes, and perceptions (Teddlie & Tashakkori, 2003). Hence, the chosen research methodology for this study is a qualitative approach that utilises a structured Delphi technique combined with *fuzzy* Decision-Making Trial and Evaluation Laboratory (DEMATEL) analysis (Hsu & Sandford, 2007).

The Delphi method is structured to gather and aggregate expert opinion on complex issues. It assumes that group judgment is often more accurate than individual judgment and was initially developed in the 1950s to forecast technological developments. It has been deployed in various fields, including healthcare, to gather and synthesise expert opinion for informed treatment options, policy, and research. It can achieve consensus by employing several questionnaire rounds (Hasson et al., 2000), thereby increasing the reliability of the results (Hsu & Sandford, 2007).

## 4.9. Research phase 2: Semi-structured interviews

Figure 4.4 presents an interview context framework and identifies the type of interview, the interview techniques to use, and the environment in which the interviews are conducted (Crotty, 1998).

Semi-structured interviews are a hybrid of structured (based on a rigid set of interview questions) and unstructured (typically broad questions based on themes) interview questions, in which the researcher may vary themes and interview questions between interviews (Wilson, 2014). The order of the questions may also vary depending on the flow of discussion, or additional questions may be required to satisfy the research objectives. Figure 4.4 presents the interview process flow between standardised and non-standardised interviews.

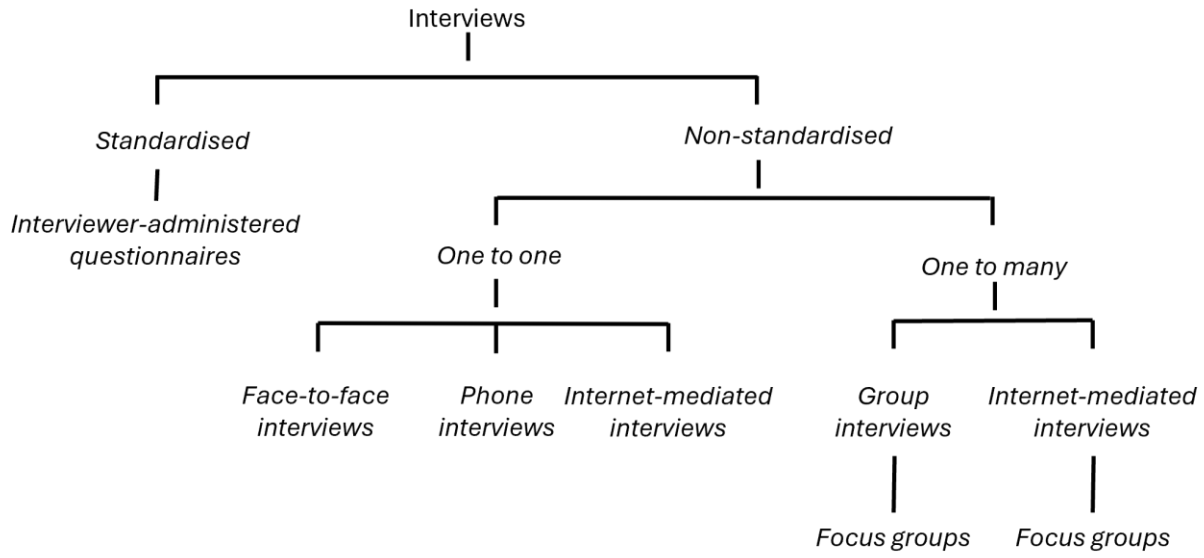



**Figure 4.4. Forms of interview**

Source: Saunders et al. (2015)

Bryman and Bell (2011) discuss a key advantage of qualitative research: the researcher's ability to "see through the eyes of the people studied" (p. 402). This ability enables the elaboration of deep insights and deeper understandings during the one-to-one, face-to-face interview process since clarity, reflection, and review can co-occur.

Cohen and Crabtree (2006) note that one benefit of semi-structured interviews is the ability of the interviewer to prepare questions ahead of the interview, which gives the perception of competence and allows the participants to express their opinions freely. Another benefit of using a set list of questions is the flexibility for follow-up questions to flesh out responses. This ability allows a greater understanding of successes, shortcomings, and concerns that each participant may face within their decision-making process, depending upon the principles within their respective organisational structure. Semi-structured interviews can provide reliable and comparable qualitative data (Cohen).

Questionnaires can provide a comprehensive, representative summary of a population's specific characteristics, beliefs, attitudes, opinions or behavioural patterns. They are used to study social systems and particular phenomena in the field. This work is always conducted in response to an overarching a priori research question and generally consists of specific research dimensions. Questionnaires that multiple respondents complete are typically called surveys (Saunders et al., 2015). Several factors related to the research question influence the choice of the questionnaire, such as respondent characteristics, response integrity, the sample size required, and the types and numbers of questions needed to satisfy data collection

(Saunders). Figure 4.5 presents the available questionnaire types, self-completed or completed by the interviewer.

An explicit concern about questionnaires centres on response reliability. For example, when addressing an individual with a postal questionnaire, there is no way of knowing if the intended recipient or someone else completed the questionnaire. Other considerations relating to the type of questionnaire include available resources, such as the time required for data collection, financial constraints with data collection and entry, and the availability of interviewers. Although uncertainty arises around the number of participants to interview, in practice, sampling should cease upon achieving categorical and theoretical saturation.

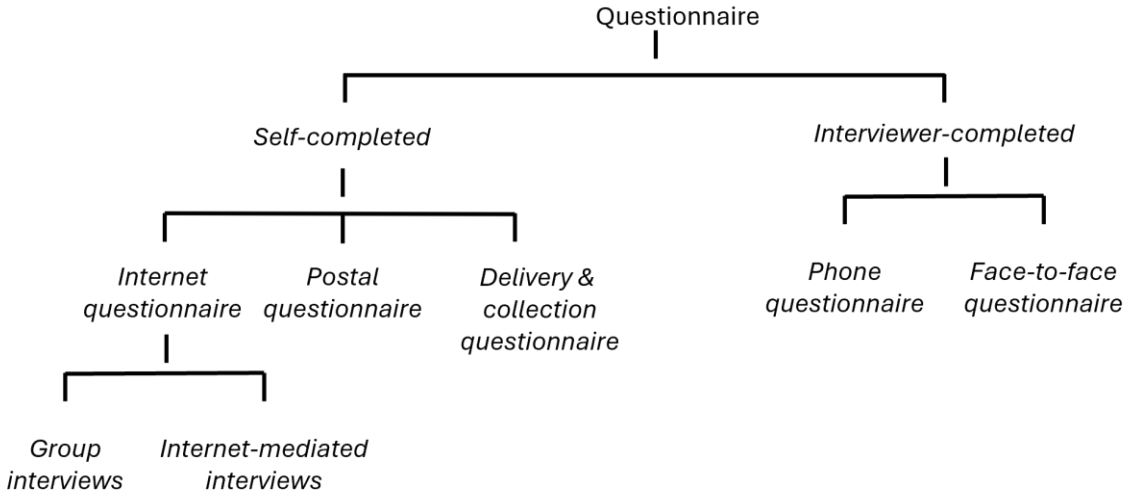



**Figure 4.5. Forms of questionnaire**

Source: Saunders et al. (2015)

## 4.10. Unit of analysis

The concept of a unit of analysis is integral to addressing various methodological issues within research. It is commonly defined as "the entity that is being analysed in scientific research" (Dolma, 2010, p. 169) or as the level at which data aggregation occurs during the research process (Cavana et al., 2001). From a more focused methodological perspective, the unit of analysis refers to the smallest unit under investigation in a study (Matusov, 2007).

Dolma (2010) classifies units of analysis into one of three levels:

- **Individual-level** – is the most common unit of analysis and might include individual students, employees, and registered voters.

- **Group level** – consists of multiple individuals when a study focuses on work teams, departments, divisions, project teams, and dyads.
- **Organisational-level** – is involved when the managerial sciences and other social science disciplines investigate broader units than groups (and may involve multiple groups within themselves). Such investigations might include studies analysing business corporations, not-for-profit organisations, and universities.

Cavana et al. (2001) assert that the research objectives drive the selection of the unit of analysis. Matusov (2007) elaborates that units of analysis should be considered partial, incomplete, and open constructs influenced by the studied object, the researcher's focus, the research audience, and the research participants, distinct from the study's object.

Although this research addresses the perceptions and beliefs of individuals, dyads, and groups, it emphasises producer/consumer organisation relationships. Consequently, this study used a group-level unit of analysis. Specifically, the Operational Leadership Board (OLB) of the DHB, representing the highest tier of operational decision-making within the organisation, was designated as the unit of analysis for this phase of the research. The OLB included Chief Executives, Chief Financial Officers, Chief Medical Officers, Chief Information Officers, and Chief Operating Officers from all five DHBs within the Midland Region of New Zealand.

## 4.11. Sampling strategy

Research outcomes and generalisations are only as good as the sample that generated the data. A sampling strategy will need to consider the characteristics and distribution of the target population. The researcher will decide how many people to include, what individual characteristics of participants are likely to influence responses to questions (random error) and the experimental conditions that might affect the overall quality (systematic error) (Wilson, 2014).

Qualitative research often uses non-random samples, with the common types being convenience, purposive, quota and snowball (Daniel & Harland, 2018). Convenience or 'accidental' sampling is where randomness can still be applied, although participants are easy to reach. Purposive sampling is when samples with a particular purpose in mind are selected, and it can lead to absolute inclusion and exclusion criteria. Quota sampling selects participants from the population of interest and is non-random. Snowball sampling is where the researcher solicits participants from existing participants when there are challenges to attracting enough participants (Daniel).

Common types of probability sampling include simple random sampling, stratified random sampling, cluster sampling, and multistage sampling. Simple random sampling, widely used in experimental research, ensures that every member of the population has an equal chance of being included in the sample (Moore & McCabe, 2006). Stratified random sampling, or segment or quota random sampling, involves dividing the population into subgroups (strata) and drawing samples from each stratum to ensure that the sample accurately reflects the population's characteristics. Cluster sampling entails selecting clusters or groups from a population and treating these clusters as representative. Multistage sampling combines several sampling techniques to improve the efficiency and effectiveness of the sampling process.

This qualitative study employs a non-random, purposive sampling strategy, which allows for the deliberate selection of participants most likely to provide relevant insights into the research questions (Wilson, 2014). Determining sample size is crucial: too few participants may limit the generalisability of the findings, while too many may lead to unnecessary expenditure without additional benefit. The response rate significantly affects the study's ability to generalise results; a higher response rate typically reduces sampling error and increases confidence in the generalisability of the findings (Daniel & Harland, 2018). Later chapters discuss the specific selection criteria for each data collection phase.

In identifying the characteristics of an ideal healthcare system, the critical issues and driving factors, the research methodology involved a Delphi survey followed by interviews to delve deeper into the factors and their interrelationships. This approach effectively yielded comprehensive insights from healthcare professionals, highlighting the critical factors for successfully implementing a healthcare business model.

## 4.12. Delphi study overview

### 4.12.1. Data collection

The Delphi data collection process involved several iterative rounds of collecting and synthesising information from a panel of expert stakeholders. It aims to reach a consensus or make informed decisions on a specific topic. Pilot testing was employed to refine the initial methodological instrument, enhancing its validity and reliability (Kvale & Brinkmann, 2015).

It is important to note that the Delphi method emphasises anonymity to prevent undue influence, bias, or dominance of participants (Teddlie & Tashakkori, 2003). Additionally, the facilitators are crucial in designing the questions, managing the rounds, and summarising responses unbiasedly.

As Peirce (1986) described, abductive reasoning involves generating hypotheses that best explain observed phenomena, often starting with incomplete data and iterating to refine understanding. This approach emphasises the exploration of data to identify emerging patterns and suggest plausible explanations based on those patterns (Timmermans & Tavory, 2012).

Since the objective was to employ an abductive approach to explore the data, identify patterns, and propose plausible hypotheses, it was essential to frame questions to facilitate an open exploration of ideas without leading respondents toward predetermined conclusions (Charmaz, 2014). As such, it is critical to design data collection methods that allow respondents to express their views and experiences freely, thus enabling a comprehensive exploration of the subject matter without leading them. The task also requires a methodological approach that avoids biasing responses or constraining the scope of the inquiry.

Consequently, this study employed a strategy of providing possibilities and framing questions neutrally, an approach that aligns with best practices in qualitative research, where the aim is to elicit rich, detailed responses that reflect the participants' perspectives and insights without steering them to specific outcomes (Creswell & Poth, 2016).

#### 4.12.2. Data analysis

Combined with the DEMATEL method, the Delphi factor ranking technique provides a robust and systematic approach to analysing complex inter-relationships between the factors affecting the proposed new healthcare business model. The approach systematically analyses complex inter-relationships and helps identify the most influential factors for further consideration (Hsu & Sandford, 2007; Yang & Lin, 2019). *Fuzzy* DEMATEL is especially beneficial as it captures the subjective and uncertain nature of the factors affecting the proposed new healthcare business model.

### 4.13. Interview study overview

#### 4.13.1. Data collection

The interviews that followed the Delphi study involved purposive sampling, in which the researcher met with senior DHB personnel and other industry participants. Interviewee selection aimed to ensure participant flexibility via different backgrounds and expertise that would allow similar themes to permeate (Patton, 2014). Interviews that lasted between 60 and 90 minutes followed a standard data collection protocol. The discussion involved a semi-structured approach (Creswell, 2007), allowing for a flexible yet consistent exploration of critical topics. This approach helped mitigate potential dichotomies by balancing

structured questions with the flexibility to explore emergent themes. Interviews were typically audio-recorded, with prior written consent from participants, ensuring an accurate record of the discussions (Smith, 2024).

Although the interviewees possessed the information sought, the researcher played a crucial role in guiding the conversation (Kvale & Brinkmann, 2015) to ensure the focus remained on relevant topics while allowing the free sharing of insights. Additionally, the abductive approach necessitated suggesting possibilities to respondents without unduly leading them, encouraging open-ended exploration and identifying underlying patterns (Tavory & Timmermans, 2014).

### 4.13.2. Data validity and reliability

Ahmed's (2024) trustworthiness framework (Table 4.4) assisted the researcher in achieving the validity and reliability of the data in this study. The framework's four dimensions—credibility, transferability, dependability, and confirmability—provided a robust structure for ensuring the rigour of the qualitative design.

**Credibility**

The study employed triangulation across data collection sources and perspectives to enhance credibility. In addition to semi-structured interviews, observational notes, and document reviews added depth and convergence to findings. Prolonged engagement with senior health professionals across multiple sessions fostered trust and enabled a nuanced understanding of the transformative healthcare context. Furthermore, the researcher actively maintained reflexivity through journaling and critical dialogue, acknowledging and mitigating potential bias throughout the study.

**Transferability**

Including thick descriptions of participant experiences and the healthcare context supported transferability. These detailed narratives, supported by verbatim excerpts, allow readers to assess the applicability of findings to other settings. Clear articulation of the purposive sampling strategy ensured a well-considered and diverse participant pool, which enhances the potential for the findings to resonate across and beyond New Zealand's healthcare landscape.

**Table 4.4. Strategies for ensuring trustworthiness in qualitative research**

| Trustworthiness Component | Strategies for Researchers |
|---|---|
| **Credibility** | 1. Prolonged Engagement:<br>Spend adequate time in the field, building rapport with participants to understand their perspectives deeply.<br>2. Reflexivity: Acknowledge personal biases and preconceptions throughout the research process.<br>3. Triangulation: Employ multiple data sources or methods (e.g., interviews, observations, documents) to cross-verify findings |
| **Transferability** | 1. Thick Descriptions:<br>Provide detailed contextual information to enable readers to assess the transferability of findings.<br>2. Sampling Strategies:<br>Clearly articulate the sampling process and criteria to justify the potential transferability of the findings. |
| **Dependability** | 1. Methodological Documentation:<br>Detail the research procedures and decisions made during the study.<br>2. Audit Trails: To ensure traceability, keep an audit trail of research decisions, changes, and data analysis processes. |
| **Confirmability** | 1. Peer Debriefing:<br>Engage with colleagues or experts to review interpretations and findings, minimising researcher bias.<br>2. Member Checking:<br>Allow participants to review and confirm the accuracy of the findings to enhance confirmability.<br>3. Reflexive Journaling:<br>Maintain a reflective journal documenting personal thoughts, biases, and reflections throughout the study. |

Source: Ahmed (2024)

**Dependability**

Meticulous documentation of research procedures ensured methodological consistency. A structured interview protocol, NVivo-coded transcripts, and detailed field notes form a comprehensive audit trail, capturing iterative decisions, thematic refinements, and coding logic. This transparency facilitates both replicability and the evaluation of methodological soundness.

**Confirmability**

Confirmability was through peer debriefing, reflexive journaling, and member-checking. Regular discussions with supervisors and academic peers ensured that interpretations received external critique and refinement. Reflexive journaling tracked the researcher's evolving insights and potential biases, reinforcing a transparent research stance. The findings were also anchored in participants' voices, rather than researcher assumptions, by validating the interpretations directly with participants.

Member-checking was conducted by sharing emerging themes and key summaries with participants for validation. This process ensured that interpretations authentically reflected participants' intended meanings and lived realities. Face-to-face interviews also allowed for real-time clarification of ambiguity, further strengthening internal validity.

Following Bryman and Bell (2011), ontological authenticity was addressed by enabling participants to deepen their understanding of their roles and experiences within the broader health system. Similarly, tactical authenticity was observed, such as when participants reported feeling empowered to reflect on system-level challenges and their potential role in addressing them.

As Marshall (1996) asserts, the goal of qualitative research is not statistical generalisability but rather the pursuit of richer, contextually grounded understandings of complex human systems. In this study, rigour has been achieved through methodological integrity and theoretical congruence, ensuring that findings are credible and meaningful within New Zealand's healthcare transformation landscape.

Triangulation, member-checking, and NVivo coding transparency enhanced trustworthiness. Member-checking involved sharing key themes and summaries with participants to validate the accuracy and ensure the findings accurately represented their perspectives. Face-to-face (one-on-one) interviews enabled any ambiguity to be resolved and clarified, and the study conditions replicated easily, providing confidence in both external and internal validity and internal and external reliability. Marshall (1996) comments that by using a qualitative approach to research, "An improved understanding of complex human issues is more

important than generalisability of results" (p. 524). Interviewer bias requires consideration to ensure the authenticity of the data. In particular, the ontological authenticity, where, according to Bryman and Bell (2011), research has helped the participants better understand their social environment. Similarly, tactical authenticity is when the research has empowered participants to the extent that they engage in action. Data analysis

Glaser (1992) defines qualitative analysis as 'any analysis that produces findings or concepts and hypotheses, as in grounded theory (the systematic generating of theory from data), that is not arrived at by statistical methods. Yin (2009) suggests that where the researcher has used existing theory to formulate the research question and objectives, theoretical propositions may assist in devising a framework to direct and organise the data analysis.

Thematic analysis is a generic approach for analysing qualitative data that is accessible and flexible. Braun and Clarke (2006) refer to thematic analysis as a 'foundational qualitative analysis method. The essential approach is to search for themes or patterns across a dataset, such as interview transcripts (Wilson, 2014). Thematic analysis is adaptable, as the researcher can move between deductive and inductive research approaches and induce theory similarly to Grounded Theory.

Coding, to categorise data with similar meanings, involves labelling each data unit within a data item, such as a transcript, with a code summarising the sense of that abstract (Saunders et al., 2015). A qualitative data set may reference actions, behaviours, beliefs, events, ideas, interactions, outcomes, policies, and relationships. Without adequate coding, it may be impossible to comprehend all the meanings in the data that are of interest. Figure 4.6 highlights the relationship between the principal code sources (Saunders).

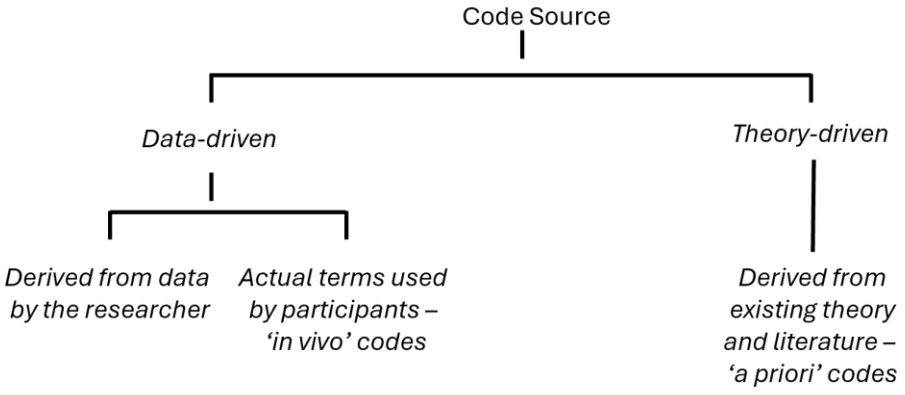



**Figure 4.6. Thematic analysis sources and codes**

Source: Saunders et al. (2015)

The organised data were assigned unique codes to help categorise them into themes. Reading and rereading helped to identify data themes, and although highly time-consuming, it was essential (Wilson, 2014). The study utilised NVivo software to analyse the data, which aided operational efficiency. Once the task of coding the data was complete, developing themes and categories and interpreting the findings could begin. A significant part of analysing the data involves looking for connections between the categories identified in each transcript. Wilson (p. 288) suggests the following questions to ask concerning each type:

- Is there a relationship between the categories?
- How meaningful are these relationships?
- Is this consistent with previous research?
- Why are there differences or similarities between categories?

Content analysis systematically converts text (qualitative data) to numerical variables for quantitative data analysis (Collis & Hussey, 2003) and typically involves four steps:

1. Identify the unit of analysis – recording unit, sentence or paragraph.
2. Choose categories relevant to the issues. They must be reliable so that if someone repeated the analysis, they would find the same information (increased reliability).
3. Agree on the categories, then read through the material and apply these codes to the units of text.
4. Tabulate the material. Present the categories and list the assertions under them.

A key benefit of content analysis is the ability to explore what is said (context) and not said (form) in successive stages of the interview (Merton, 1987). Content analysis is a method associated with interpreting visual and written material, and it realises the benefit of being a relatively straightforward and unobtrusive data collection method. It can provide insights into how language conveys meaning (Wilson, 2014).

## 4.14. Ethical considerations

This management research involved human participants (capturing the beliefs and perceptions of DHB managers, staff, and other interested parties). *While the study is concerned with the enablers and barriers to a potential new platform-based model of healthcare services provision, there was no intention to survey or interview patients or access their private information*. Participation was completely confidential, and a locked filing cabinet secured all the data gathered from interviews and surveys, with the researcher having the only key. A password-protected personal computer stored the soft copies.

Formal processes assured participant consent, anonymity, and confidentiality throughout, and the University of Waikato Human Research Ethics Committee twice approved the procedures for this low-risk project on 1 March 2021 (#HREC(Health)2020#66) and on 31 August 2021 (#HREC(Health)2021#67).

## 4.15. Limitations and assumptions

The study's reliance on qualitative methods while providing rich and detailed insights may limit the generalisability of the findings. Qualitative research often involves smaller sample sizes and context-specific analyses, which might not apply to broader populations or different healthcare settings. Future studies could complement qualitative approaches with quantitative methods to enhance the generalisability and robustness of the findings (Creswell & Clark, 2017). A full description of study limitations (and research opportunities) appears in Section 10.5.

## 4.16. Conclusion

This methodology chapter has delineated a comprehensive blueprint underpinning the pursuit of scholarly inquiry. It has meticulously traversed the realms of research design, data collection, and analysis, weaving a coherent tapestry of methodological choices that align seamlessly with the research objectives. By establishing a multi-method research design and embracing quantitative and qualitative approaches, the chapter reflects a holistic engagement with the research landscape, ensuring a robust and nuanced understanding of the phenomena under investigation.

The selection of the unit of analysis and the adoption of a purposive sampling strategy were pivotal in ensuring the representativeness and depth necessary to illuminate the research questions. The rigorous and systematic approach to sampling has facilitated the inclusion of diverse perspectives, enhancing the richness of the data collected.

The intricate interplay of data collection models and data analysis techniques mirrors the nuanced nature of the research domain. This multifaceted approach enabled the capture and interpretation of complex insights, providing a comprehensive understanding of the research context. The integration of semi-structured interviews, secondary data collection, and thematic content analysis exemplifies the methodological rigour employed in this study (Creswell, 2007; Saunders et al., 2015).

Meticulously addressed ethical considerations underscored a commitment to the treatment of participants. The adherence to ethical guidelines ensured that the research upheld the highest integrity and respect for

participant rights. Additionally, pilot testing refined the methodological instruments, enhancing their validity and reliability (Kvale & Brinkmann, 2015).

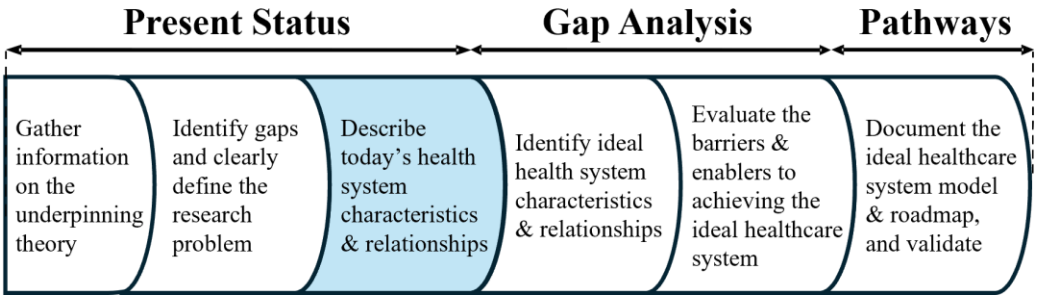
Moreover, exploring the theoretical framework infused the methodology with a robust conceptual backbone, anchoring the study within established scholarly discourse. This theoretical grounding provided a clear lens to examine the research questions, ensuring coherence and intellectual rigour (Stake, 1995).

Discussion of the efforts to mitigate the study's limitations and uphold the research's validity and reliability, as well as transparency surrounding these limitations and assumptions, ensures an intellectually honest approach, providing a clear understanding of the scope and constraints of the findings (Maxwell, 2012).

In conclusion, this methodology chapter has laid a solid foundation for the empirical phases of the study. Integrating diverse methodological approaches, ethical considerations, and theoretical grounding allows for a comprehensive exploration of the research questions. The following two chapters describe the Delphi and interview phases of the study, respectively, building upon this methodological framework to delve deeper into the empirical findings.

# Chapter 5: Findings: Research Phase 1—Delphi Survey

## 5.1. Introduction




This chapter delineates the application of the Delphi method during the first phase of this research, detailing the process involved in survey administration, data collection, and analysis. It presents the Delphi findings.

The contents are structured as follows: Section 5.2 provides an overview of the Delphi survey methodology, including its theoretical underpinnings and procedural steps. Section 5.3 discusses the selection criteria and recruitment process for the expert panel. Section 5.4 outlines the survey design and administration process, detailing the formulation of questions and the iterative rounds of data collection. Section 5.5 presents the *fuzzy* mathematical analysis that generated a causal diagram representing the identified relationships and cause-and-effect between various healthcare factors. Sections 5.6-5.8 present the data analysis techniques employed to synthesise the expert feedback. Section 5.9 presents a causal diagram that illustrates the dynamics of the ideal healthcare system. Finally, Section 5.10 concludes with a summary of the key findings from the Delphi survey, setting the stage for the subsequent interview phase of the research.

## 5.2. Delphi method

The Delphi method, recognised for its systematic and iterative approach, was employed in this research to gain consensus among a panel of experts on complex issues within the healthcare system transformation domain. Originating from the RAND Corporation in the 1950s, the Delphi technique's utilisation across various fields is due to its ability to harness collective intelligence and provide reliable insights (Dalkey & Helmer, 1963).

The Delphi method typically begins with selecting a panel of experts based on their knowledge and experience in the relevant field. These experts initially respond to questionnaires that elicit opinions on a specific topic. The responses are collated and analysed in a summary report. The experts are presented with

this summary report in the subsequent round and asked to provide updated opinions. This process continues until consensus, or a predetermined stopping point, is reached.

According to Linstone and Turoff (2002), one of the critical advantages of the Delphi method is its ability to gather and synthesise the opinions of experts who may not be able to meet in person due to geographical or other constraints. Additionally, the process's anonymity helps reduce social influence and bias in the responses.

While the Delphi method has benefits, it is not free of limitations. The main criticisms of the process are that reaching a consensus can be costly and time-consuming. Additionally, the method relies on the panel's expertise, and panel member selection may influence the quality of results. According to Teddlie and Tashakkori (2003), it is essential to carefully consider the suitability of the Delphi method for a specific application and to plan accordingly to minimise the limitations while maximising the benefits.

## 5.3. Sample selection

A pilot study to test the robustness of the questionnaire used a purposive sampling approach. Table 5.1 indicates the makeup of the pilot panel, all selected for their knowledge and experience of New Zealand's public health sector.

**Table 5.1. Pilot Delphi study sample**

| Organisational Role | Discipline(s) |
|---|---|
| VP (Health) Product Innovations | Commercial enterprise |
| Community Pharmacy Manager, Ministry of Health | Telehealth Medical Professional |
| General Manager (RN), Community Health Centre | Telehealth Medical Professional |
| Senior Portfolio Manager, Ministry of Health | Ministry of Health—monitoring |

Source: The Author

Similarly, Table 5.2 presents the purposive sample for the main Delphi study.

**Table 5.2. Main Delphi study sample**

| Organisational Role | Discipline(s) |
|---|---|
| Clinical Director, Charitable Trust | Telehealth Medical Professional |
| Professor in Logistics and Supply Chain Management | Academic |
| Regional Telehealth Services Liaison – Regional Services | Telehealth Advisor/Program Manager |
| Senior Advisor, Primary and Community Wellbeing, Mental Health and Addictions, Ministry of Health | Ministry of Health—data and digital |
| Telehealth Program Manager | Telehealth Advisor/Program Manager |
| Business Partner, Emerging Health Technology and Innovation, Data and Digital, Ministry of Health | Ministry of Health—data and digital |
| Manager—Digital Portfolio, Data and Digital, Ministry of Health | Ministry of Health—data and digital |
| Telehealth Program Manager | Telehealth Advisor/Program Manager |
| Associate Professor of Logistics and Supply Chain Management | Academe |
| Director | Telehealth Medical Professional |
| Chief Clinical Officer | Telehealth Medical Professional |

Source: The Author

## 5.4. Delphi procedure

Participation in the Delphi study was entirely confidential, and the plan was to guide the expert panel towards consensus over several survey rounds, as indicated in Figure 5.1.

**Round 1**

Panel members reflect on New Zealand's (primary through tertiary) healthcare system before outlining an 'ideal solution' judged capable of transforming the performance of today's pipeline model. They also list and rank the main factors likely to enable or inhibit acceptance of this ideal.

**Round 2**

The researcher analyses the responses and returns the collated findings to the Panel. The members review their opinions and attempt to reach a consensus using this new information. If the experts cannot achieve a consensus, this procedure is repeated.

**Round 3**

The researcher analyses the panel responses from the previous round and returns the collated findings to the forum as the 'consensus solution'. Panel members comment on this and rank the identified factors judged likely to enable or inhibit its acceptance/adoption. They also consider the extent to which identified enablers and inhibitors impact each other.

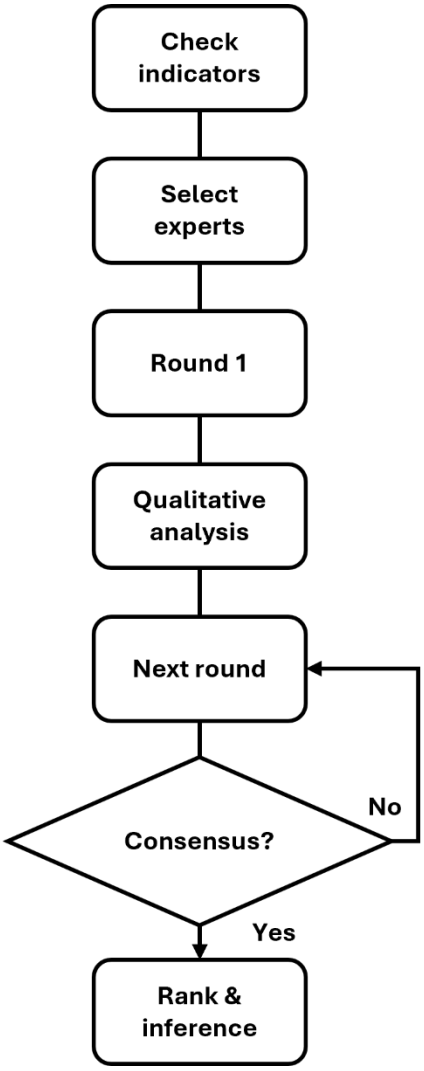
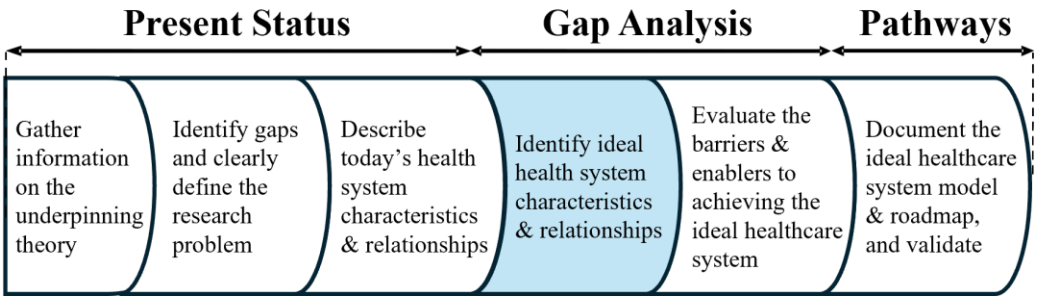



**Figure 5.1. Indicative Delphi procedure**

Source: The Author




### 5.4.1. Data collection: Round 1

Having received ethics approval (refer to **Appendix A**), Round 1 of the Delphi Survey could commence. An invitation to be a panel member is in **Appendix B**, with the general procedure in **Appendix C**, and the questionnaire for Round 1 in **Appendix D**. The expert panel members were requested to provide demographic information: position title, main area(s) of responsibility, years of experience in this industry and current role. They then commented on New Zealand's healthcare system (primary through tertiary) before being invited to imagine an ideal transformed healthcare system that is highly effective and affordable. The aim was to gain a rich picture of a new (end-to-end) healthcare system regarding its main operational characteristics and advantages/disadvantages compared to the present arrangement. Also elicited were the likely inhibiting/enabling factors conforming with the National/Organisation/ Management-level decision framework.

### 5.4.2. Data collection: Round 2

**Appendix E** contains the questionnaire for Round 2. Aided by a summary of the panel's responses from Round 1, the members considered those aspects of the current New Zealand healthcare system that any new system must retain at all costs. Then, to help reach a consensus on a transformational end-to-end healthcare system, the panel was asked to comment on four system components derived from the healthcare system alternatives they had reported in Round 1. For each alternative, they considered whether the vision for the new healthcare system component is achievable and why, or missing/redundant, the delivery mechanisms needed to deliver the stated outcomes and the required stakeholder behaviours, as shown in Table 5.3. The components were also ranked.

**Table 5.3. Ideal system—components**

| |
|---|
| **Component 1** |
| ***Guiding Principle:*** <br> The ideal healthcare system is founded on the principle of **'equitable access.'** <br> ***Vision Statement:*** <br> A **healthcare system** that is based on need and not ethnicity, age, sexual orientation, disability, location, or employment status. Power imbalances are tilted more in the patient's favour, and there are no barriers to treatment. |
| **Component 2** |
| ***Guiding Principle:*** <br> The ideal healthcare system for New Zealand is founded on the principle of **'patient-centred care.'** <br> ***Vision Statement:*** <br> **A healthcare system** that seamlessly connects healthcare providers with healthcare consumers across the continuum of care, from primary care to tertiary care. |
| ***Component 3*** <br> ***Guiding Principle:*** The ideal healthcare system for New Zealand is founded on the principle of **'integration.'** <br> ***Vision Statement:*** <br> **A healthcare system** that is adequately resourced and funded, and transformed by technology. It operates via integrated healthcare hubs in every town, city and region across the country. |
| **Component 4** <br> ***Guiding Principle:*** <br> The ideal healthcare system for New Zealand is founded on the principle of **'shared resources.'** <br> ***Vision Statement:*** <br> **A healthcare system** in which unused/underutilised health-related resources are dynamically available to healthcare providers with immediate needs (via platforms similar to Airbnb, for example). |

Source: The Author

Each panellist selected one or multiple components as their 'preferred solution'. They then wrote a '**Guiding Principle'** statement and a '**Vision Statement'** for this transformational end-to-end healthcare system. Finally, with the aid of the provided National/Organisation/Management-level decision framework, they explained why they believed their solution was possible, the advantages/disadvantages and the required stakeholder behaviours.

### 5.4.3. Data collection: Round 3

The Round 3 questionnaire is in **Appendix F**. The main aim for the final round was to understand the dynamics of the ideal healthcare system by focusing on the success factors identified by the expert panel in

Round 2. This understanding required eliciting from the panel the degree to which the factors at the national, organisational, and management levels (organisation-side and patient-side) influence every other element.

### 5.4.4. Data analysis with Fuzzy DEMATEL

The *fuzzy DEMATEL* (Decision-Making Trial and Evaluation Laboratory) method is an extension of the classic DEMATEL method and a helpful structural modelling approach to understanding the cause-and-effect relationships among a system's constituents (Tzeng et al., 2010). DEMATEL can be applied to confirm the existence of a relationship/interdependence among components or reflect the relative level of relationships within them. *Fuzzy*-DEMATEL further quantifies causal relationships among factors by considering the degree of uncertainty and vagueness of the expert's judgments (Yang & Lin, 2019).

Similar methods were considered, including Analytic Hierarchy Process (AHP), Analytic Network Process (ANP), Goal Programming, Delphi, Decision Making Trial and Evaluation Laboratory (DEMATEL) and Fuzzy Logic. AHP is a technique that allows the modelling of decision-making processes through problem decomposition under a hierarchical structure composed of goals, criteria, sub-criteria and alternatives, in which a set of participants evaluates each of these components by pairwise comparisons. A key weakness is that it does not assess interrelations and influences between the elements composing the decision-making process. Hence, Saaty developed the Analytic Network Process (ANP), a generalisation of AHP. However, decision alternatives and criteria may have very strong interrelations and influences when used in decision-making processes, generating a high impact on the decision (Ortiz et al., 2015).

While ANP permits evaluating the influences and interdependencies, the decision-makers sometimes do not understand the results. In contrast, being based on graph theory, DEMATEL permits comprehension of the influences by analysing elements in cause-and-effect relationships that are complex and, in some cases, imperceptible. As a complementary strategy and to improve the comprehension of the current decision-making problems, there is an inclination towards the combination of different methods [29] such as Fuzzy-AHP [30, 31], Fuzzy-ANP [32], ANP-DEMATEL [4, 33] and fuzzy-Delphi [15], whose primary aim is to reinforce the methods previously mentioned, leading to better results in the decision-making process.

The fuzzy DEMATEL method used this information to generate a causal diagram representing the identified relationships and cause-and-effect relationships between the factors identified. Fuzzy DEMATEL is especially beneficial as it captures the subjective and uncertain nature of the factors affecting the proposed new healthcare business model. Combined with the DEMATEL method, the Delphi factor ranking technique provides a robust and systematic approach to analysing complex inter-relationships between the

factors affecting the proposed new healthcare business model. The approach systematically analyses complex inter-relationships and helps identify the most influential factors for further consideration (Hsu & Sandford, 2007; Yang & Lin, 2019).

## 5.5. Findings from the Delphi study: Round 1

**'Please comment briefly on New Zealand's healthcare system (primary through tertiary).'**

Panel members described the New Zealand primary care system as robust but under pressure, undervalued, broken, and unfit for purpose. Its arrangements are fragmented, and there is no end-to-end system integration to move an outpatient through the system, from referral and triage to diagnostics and discharge.

Moreover, it is reactive and based on an illness model that has not been systematically transformed into a preventative, restorative, and wellness-focused health system. Postcode Health sees affluent areas as having no barriers to care, with poorer sectors having many obstacles to overcome, particularly in rural areas. The system is provider-focused and perceived to be bad for Māori and Pacifica.

**Positives:**

Most of the New Zealand population has access to a primary care provider or can access an Emergency Department with relative ease, receiving good service. Dedicated teams can do more.

**Negatives:**

Particularly noted were inequity of access, variability of care and differing patient treatment pathways. Healthcare is a postcode lottery with a lack of clinical oversight and an emphasis on fiscal austerity. Transformational change is difficult when DHBs are heavily preoccupied with the high costs of medical technology, hospital facilities and employee costs. Digital health remains fragmented, and health services lack a contemporary digital approach. Rural inequity was a strong theme.

**Interesting Aspects:**

Considerable growth of technology mirrors an apparent increase in competition and silos across the country. There is a disconnect between the bulk funding model and purchase unit codes (PUCs). However, pockets of innovation deliver health in new and novel ways. Despite all the pressures, the system still attracts passionate and dedicated people who want to make a difference.

**'Now imagine an ideal transformed healthcare system that is highly effective and affordable. Try to paint a rich picture as you describe this ideal (end-to-end) healthcare system.'**

The panel proposed various desirable health sector outcomes and disruptive healthcare system alternatives to deliver the results.

## 5.6. Findings from the Delphi study: Round 2

Respondents reported the aspects of the present New Zealand healthcare system that ANY new healthcare SYSTEM must retain at all costs, Table 5.4:

**Table 5.4. Features to retain**

| **Specialist services (spread across the country)** |
|---|
| Experienced workforce |
| A publicly funded healthcare system |
| Patient-centric and closer-to-home |
| ACC and Health & Disability Commission |
| Access to Primary Care (subsidised where necessary) |
| Emergency care for all |
| Consumer choice for their primary care provider |
| Dedicated funding for independent providers, e.g. Lead Maternity Carer and Pharmacy |

Source: The Author

Grouping the common elements of the healthcare system alternatives into the following discrete system components assisted the panel in reaching a consensus on a **transformational end-to-end healthcare system**:

***Component 1 – An ideal healthcare SYSTEM for NZ founded on the principle of 'equitable access'***

Respondents variously described challenges with finite resources, i.e., there is too much need to meet demand and expectations with the limited funds available. Commissioning of services is a significant challenge with no fluidity in the system, i.e. allowing autonomy in decision-making based on need as opposed to policy developed around behaviour. Agility was seen as a barrier when people agree that change is needed, but do not have the capacity or permission to change. Some panellists suggested that a radical shift in delivery towards decentralised locations is required to achieve this.

***What is missing from this healthcare system?***

Missing elements include the ease of adapting to a new environment, systems, and technologies. Outdated contractual arrangements, accountants, and a lack of investment in new models of care constrain the present system. Equitable processes must acknowledge that there are already inequities and that barriers differ for every patient, and no single model can accommodate everyone's needs. Some panellists agree that change is required but do not have the capacity or permission to make it happen. Also, a system hampered by slow decision-making and inefficient internal processes requires more agility.

***What is redundant in this system?***

Unwieldy back-office functions and power imbalance across the specialties distract from the quality of care accessible to everyone.

***What delivery mechanisms are required?***

A change in mindset about what our population needs and how we deliver those services: patient-centred care must offer choice (of delivery mode and treatment modality). A change in prioritisation mechanisms for DHBs and the Ministry of Health to ensure requests for funding and spending are approved more collaboratively.

***What behaviours do stakeholders require?***

A willingness to be open to different ways of working and thinking about service delivery. A willingness to adopt new technologies that will disrupt the model of care. A desire to work as part of a team to achieve identified goals. Collaboration and consumer engagement. A willingness to accept that there will be things to learn from that do not always work out as anticipated. What is needed is a shift in power, with consumers willing to engage in conversations about outcomes around risks, rewards, and benefits.

***Component 2 – An ideal healthcare SYSTEM for NZ founded on the principle of 'patient-centred care'***

Respondents agreed that this was achievable technically via investment across data systems to enable access to data/information. However, there could be challenges with privacy and consent issues, concepts that need to be understood from the consumer perspective to ensure the mechanisms put in place work for consumers. While new digital technology can help move consumers through the system, connecting with patients relies on their willingness to participate and be available. Not all consumers have access to technology or the

skill/desire to use it. Some consumers do not prioritise their health, and when the healthcare provider schedules appointments, they do not attend.

***What is missing from this healthcare system?***

Missing elements around patient-centred care as a seamless connection include wrap-around services, e.g., the Ministry of Social Development (MSD), Digital literacy programs, housing, and consumer healthcare literacy to recognise when they need to engage with healthcare providers. A new patient-centred care system will likely rely on digital means, so it must carefully consider digital exclusion and how to overcome it. Focusing on a patient model may neglect the factors outside health that impact people, and a well-being approach would help ensure that an illness model approach is not delivered.

***What is redundant in this system?***

The Non-Government Organisation (NGO) sector and caregivers (examples). Is there still a place for health navigators in a seamless system? The need to reschedule missed appointments.

***What delivery mechanisms are required?***

There is a need for improved digital technology, time for health providers to spend on communication and increased digital health literacy. Information communication technology will be central to providing this outcome. The discussion included the 'smart system' that understands and proactively resolves needs. Clinicians know the steps and care plans, and patients and whanau are engaged in all aspects of their care and can engage with the system at their convenience. IT systems would need an upgrade. Embrace telemonitoring so that when a patient's device (e.g. glucose meter) signals an alert, contacts the patient and the medication is changed, or the patient goes to a hospital for treatment. Online booking systems allow patients to select appointment dates and times that suit them via a 24/7 service for all healthcare providers.

***What behaviours do stakeholders require?***

These included improved digital technology, time for health providers to spend on communication, and increased digital health literacy. Invest in understanding digital technology, ongoing collaboration across the sector, and the removal of competition. Healthcare providers always contact patients to agree on a mutually acceptable appointment time. Consumers always attend their appointments or advise whether they want a system discharge. Those making referrals would upskill to ensure that the triaging clinician received

all information required for decision-making. The triaging clinician always writes a thorough Care Plan when declining a referral.

***Component 3 – An ideal healthcare SYSTEM for NZ founded on the principle of 'integration'***

Respondents agreed integration was possible, provided the technology exists, is used, and works. Respondents discussed whether 'integration' has been adequately defined. There is a shortfall in several professions, including nursing and IT, and a skills shortage, e.g., ICU-trained nurses. Funding is unlikely ever to meet demand as technology is rapidly improving, and the population is growing. There was also an increased dependency culture in the COVID climate when those isolated felt it was their right to make unreasonable demands for 'essential items'. For example, a *Whakarongorau* client refused cooking flour because it was the wrong brand, and another requested toys to entertain their dog.

***What is missing from this healthcare system?***

Respondents suggested that an agreed-upon definition of integration would be helpful. Others said the health workforce should staff health hubs, assist patients, and clean up after them.

***What is redundant in this system?***

As the number of people needing to attend hospital appointments decreases, there will be less need for car parking and clinical spaces.

***What delivery mechanisms are required?***

The key to this is collaboration; forced working together in a structure that holds clear clinical accountability will be central to this model. Reliable and affordable connectivity. Stable Internet, dedicated telephone and video connection, IT support for the patient, a private space, equipment, e.g. glucose meters, pulse oximeters (Vision flex). An IT system that integrates the patient journey from entry (referral/triage) to exit (discharged patients).

***What behaviours do stakeholders require?***

*Behaviours included* moving to clear clinical governance supported by clear financial principles and increased digital health literacy. The willingness of stakeholders to engage in digital education. The willingness of clinicians to learn how to use and then offer telehealth as a routine part of healthcare delivery. The willingness of CIOs to prioritise telehealth and provide the necessary integration. The willingness of

Schools, Libraries and Iwi to make health hubs available on campus. The willingness of patients and clinicians to adopt new ways of engaging with each other.

***Component 4 – An ideal healthcare SYSTEM for NZ founded on the principle of: 'shared resources'***

Some respondents did not report any evidence of unused health resources, although there was some inappropriate use. Others commented that we know most hospitals have insufficient resources and are under-capacity. Shared resources may work with a mature self-managed care model that prioritises wellbeing. There are already systems available for booking health-related resources, e.g. clinic rooms tagged with the equipment needed (e.g. Core scheduling system). There are booking systems for hospital cars. There are mobile buses that take lithotripsy, surgery and dentistry to patients. The same model can apply to many aspects of resources. However, if the resources require transport, this is a limitation. Not all equipment is 'plug and play, 'so the patient or clinician must still travel.

***What is missing from this healthcare system?***

Do people need to travel to where the resources are? For example, the relatively short driving distance from Taumarunui to Waikato can take a patient a whole day to attend an appointment due to a lack of transportation options. If there is spare theatre capacity in Auckland, but one is hundreds of kilometres away in Christchurch, is there the expectation that the patient will travel for surgery? Would there be compensation for that? Or is the model that clinical staff travel to where the people are? Bookable transport systems are needed to deliver people, specimens or equipment to the desired locations on time.

***What is redundant in this system?***

Respondents commented that nothing was redundant, as the resource demand currently exceeds capacity.

***What delivery mechanisms are required?***

Reliable technology and widespread telehealth so people do not have to travel too far. Electronic booking systems for patients, equipment, and clinicians link to transport systems. More efficient transport systems for patients—perhaps a spoke and hub model. Consider a shift in how the system manages patient care at a system level and deploys resources to that locality.

***What behaviours do stakeholders require?***

Flexibility, internal capacity to cope, and willingness to change are needed. Respondents discussed how clinicians would need to operate quite differently, e.g., deployed to where the needs are, rather than when clinics are at a particular set time.

***The ideal healthcare system for NZ***

Table 5.5 lists the above components in ranked order of importance. The respondents all agreed that the feature set described by Components 1-4 needs to be part of their ideal system. The Delphi panel components reached a consensus, with the most contentious issues around funding models and digital transformation readiness. These were acknowledged and helped to inform the subsequent qualitative phase.

**Table 5.5. Component ranking**

| Component | Defining Characteristic | Priority |
|---|---|---|
| **Component 1** – An ideal healthcare system for NZ is founded upon equitable access and need | A system that is equitable and accessible to anyone requiring healthcare, anywhere | Top priority |
| **Component 4** – An ideal healthcare system for NZ is founded upon shared resources | A system in which healthcare arrangements contain a pool of resources accessible to everyone | 2nd highest priority |
| **Component 3** – An ideal healthcare system for NZ is founded upon integration | A system in which each locality contains a fully resourced and integrated health hub | 3rd highest priority |
| **Component 2** – An ideal healthcare system for NZ is founded upon patient-centred care | A system that truly puts patient needs at the heart of everything it does | 4th highest priority |

Source: The Author

## 5.7. Findings from the Delphi study: Round 3

The purpose of Round 3 was to gather expert opinions on the dynamics of the ideal healthcare system by considering the essential factors for successful implementation. The panel considered the dynamics of the 'ideal healthcare system' by considering those factors deemed crucial for successful implementation, as identified by the panel in Round 2.

The relevant considerations, responsibilities, and authorities are conceptualised as being distributed among three governance levels to facilitate the development of a robust model. Hence, from the outset, the developed theory took the form of three interrelated frameworks, which were assumed to contain national-level, organisation-level, and Management-level considerations. As indicated in Table 5.6, considerations within each level can involve either the Organisation side or the Patient side perspective, or both.

**Table 5.6. National/organisation/management-level (NOM) decision framework**

| | **Organisation-side considerations (importance: L/M/H)** | **Patient-side considerations (importance: L/M/H)** |
|---|---|---|
| Primary Enablers/Barriers of Acceptance at the National level | (NLAO factors) | (NLAP factors) |
| Primary Enablers/Barriers to Adoption at the Organisation level | (OLAO factors) | (OLAP factors) |
| Primary Enablers/Barriers to Implementation at the Management level | (MLIO factors) | (MLIP factors) |

Examples:

- National-level issues might include Political issues (Org-side) / Digital divide issues (Patient-side)
- Organisational-level issues might include Change issues (Org-side) / Patient orientation issues (Patient-side)
- Management-level issues might include Operational issues (Org-side) / Motivation issues (Patient-side)

Source: The Author

Specifically, the *National level* of the framework focuses on those external considerations that influence New Zealand's governmental *Acceptance* of health system factors. From the perspective of the *Organisation side*, this level includes consideration of political, cultural, technical, economic and social inhibitors and drivers that influence the *Acceptance* of health system factors to achieve equitable government-citizen/patient outcomes. From the perspective of the *Patient side*, this level includes personal, cultural, economic, technical, social and political aspects that influence citizen/patient *Acceptance* of the healthcare services offered by the government.

The *Organisation level* of the framework focuses on internal considerations that influence individual health provider organisations' *Adoption* of health system factors. This level only includes *organisational*

considerations. It aims to document technical and non-technical issues that influence the *Adoption* of health system factors for achieving equitable government-patient outcomes.

Finally, the *Management level* of the framework focuses on those internal considerations that influence individual health providers' organisational *Implementation* of health system factors. From the perspective of the Organisation, this level includes consideration of technical and non-technical factors that influence *Implementation*, and it is concerned with introduction and operation aspects. From the perspective of the *Patient side*, this level includes consideration of technical and non-technical factors that influence *Implementation* and is therefore concerned with actual patient consumption of health system characteristics. Thus, the *Implementation Stage* of the *Management level* of the framework comprises three sub-stages: *Introduction*, *Operation*, and *Consumption*. The complete multi-level framework for health system acceptance is in Table 5.7. This classification places the factors obtained from the *fuzzy DEMATEL* analysis across four National-level factors, five Organisation-level factors and four Management-level factors. Specifically, panel members considered the degree to which each of the 13 factors shown in Table 5.7 influences every other factor.

**Table 5.7. NOM factors identified**

| Factor | Concept | Indicators |
|---|---|---|
| | **National-level (Acceptance) Factors – Organisation-side (Factors of concern to the highest-level stakeholders)** | |
| F1 | Appetite for Change | NO1 = Medical Council attitude |
| | | NO2 = Provider attitude |
| | | NO3 = Policymaker appetite for change |
| | | NO4 = Government support for the effort |
| | | NO5 = Nationwide Internet provision |
| F2 | Available Funding | NO6 = Sector funding amount |
| | | NO7 = Agreed division of resources |
| | | NO8 = Targeted funding for the highest needs |
| F3 | Governance | NO9 = Agreement on governance and consents |
| | | NO10 = Recent health and disability review outcomes/pending legislation |
| | | NO11 = Quality of leadership |
| | | NO12 = Quality of communication |
| F4 | Industry Structure | NO13 = Decentralised and independent healthcare entities |
| | | NO14 = The National Health Information Platform (Hira) and Telehealth |

| Factor | Concept | Indicators |
|---|---|---|
| **Organisation-level (Adoption) Factors – Organisation-side** | | |
| **(Factors of concern to senior stakeholders in provider organisations)** | | |
| F5 | Strategic Intent | OO1 = Upfront investment |
| | | OO2 = Attitude to patients |
| | | OO3 = Cooperation with other providers |
| | | OO4 = Services coordinated for each clinical area |
| F6 | Provider | OO5 = Shared physical resources |
| | Relationships | OO6 = Shared intellectual resources |
| | | OO7 = Health burden shared with allied health providers (e.g. pharmacists) |
| F7 | Systems Integration | OO8 = Proactive-care platforms (telehealth) |
| | | OO9 = Integrated healthcare systems |
| | | OO10 = Common data standards across partner organisations |
| **Management-level (Implementation) Factors – Organisation-side** | | |
| **(Factors of concern to day-to-day managers in provider organisations)** | | |
| F8 | Change Readiness | MO1 = Top management support |
| | | MO2 = Clinicians' attitude to the new business model |
| | | MO3 = Managers' perception of the need to change |
| | | MO4 = Funding incentives |
| | | MO5 = Unconscious bias |
| | | MO6 = Staff morale |
| F9 | Systems and | MO7 = Decision support capability |
| | Processes | MO8 = Trust in system information |
| F10 | Accountability | MO9 = Transparent end-to-end accountability |
| **National-level (Acceptance) Factors – Patient-side** | | |
| **(Factors of concern to senior stakeholders in provider organisations)** | | |
| None. | | |
| **Organisation-level (Adoption) Factors – Patient-side** | | |
| **(Provider-driven factors)** | | |
| F11 | Systems Intent | OP1 = Communication of strategic change |
| | | OP2 = Quality of healthcare outcome |
| F12 | Systems Capability | OP3 = IT platforms that offer convenience |
| **Management-level (Implementation) Factors – Patient-side** | | |
| **(Day-to-day factors of concern to patients)** | | |

| Factor | Concept | Indicators |
|---|---|---|
| F13 | Technology Acceptance | MP1 = Trust in the healthcare system<br>MP2 = Access to a smart device/phone<br>MP3 = Cost |

Source: The Author

A possible limitation is how the relatively small sample size (4 and 11 participants) in the pilot and final Delphi studies may reduce the findings' generalisability (Leedy & Ormrod, 2013). While the results provide insights into participant perspectives, they may not necessarily reflect the views of a larger population. Larger sample sizes would increase the findings' representativeness and enhance generalisability (Polit, 2017). Additionally, diverse samples that reflect the target population's demographic, cultural, and socio-economic characteristics would ensure that the findings apply to a broader range of individuals (Hertzog, 2008; Streiner, 2015). Nevertheless, this study provides valuable insights into the views of a specific group of individuals and can contribute to the development of more focused and targeted interventions (Bowling, 2009). In short, while the findings can apply to other national settings with a culture and operating environment like New Zealand's healthcare sector, they can only be considered a starting point for research involving larger, more diverse samples.

## 5.8. Findings from the *fuzzy DEMATEL* analysis

This study focused on using knowledge of the relationships to help identify the barriers and enablers to achieving the ideal healthcare system. Software available at onlineoutput.com generated the *Fuzzy DEMATEL* results.

### Step 1: Generate the *fuzzy* direct-relation matrix

To identify the model of the relations among the n criteria, generate an n × n matrix. If using multiple experts' opinions, all experts complete the matrix. The arithmetic mean of all experts' opinions generates the direct relation matrix z. Table 5.8 indicates the (mean) direct relation matrix, the same as the average pairwise comparison matrix across all experts.

$$z = \begin{bmatrix} 0 & \cdots & \tilde{z}_{n1} \\ \vdots & \ddots & \vdots \\ \tilde{z}_{1n} & \cdots & 0 \end{bmatrix}$$

## Table 5.8. The direct-relation matrix

| CONSOLIDATED | | Please choose the degree of influence using the following scale<br>None (0) Very Low (1) Low (2) High (3) Very High (4) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ORGANISATION-SIDE FACTORS | | | | | | | | | | PATIENT-SIDE FACTORS | | | | |
| | | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | | |
| ORGANISATION-SIDE | F1 | 0.00 | 3.50 | 3.25 | 3.50 | 2.75 | 3.00 | 3.75 | 3.25 | 2.25 | 2.00 | 2.75 | 3.00 | 3.00 | F1 | ORGANISATION-SIDE |
| Factors | F2 | 1.75 | 0 | 1.75 | 2.50 | 3.50 | 3.00 | 3.50 | 2.50 | 2.25 | 1.50 | 2.00 | 4.00 | 3.50 | F2 | Factors |
| | F3 | 2.75 | 2.75 | 0 | 3.25 | 3.25 | 2.75 | 3.00 | 3.50 | 3.00 | 3.25 | 3.00 | 2.50 | 2.50 | F3 | |
| | F4 | 2.50 | 1.75 | 1.75 | 0 | 2.00 | 2.50 | 3.50 | 2.75 | 3.00 | 2.50 | 3.00 | 3.25 | 3.25 | F4 | |
| | F5 | 2.00 | 3.00 | 2.50 | 2.50 | 0 | 3.00 | 3.50 | 3.25 | 3.25 | 2.75 | 3.50 | 3.25 | 3.50 | F5 | |
| | F6 | 2.25 | 2.75 | 2.75 | 2.25 | 3.00 | 0 | 3.25 | 3.25 | 3.25 | 3.50 | 2.50 | 2.25 | 3.00 | F6 | |
| | F7 | 3.00 | 2.00 | 1.50 | 3.25 | 3.00 | 3.00 | 0 | 2.25 | 3.25 | 2.75 | 3.00 | 3.75 | 3.50 | F7 | |
| | F8 | 4.00 | 2.75 | 3.50 | 3.00 | 3.50 | 2.75 | 2.50 | 0 | 3.00 | 2.75 | 3.00 | 3.00 | 2.75 | F8 | |
| | F9 | 1.75 | 2.00 | 1.75 | 2.75 | 2.50 | 2.50 | 3.00 | 2.00 | 0 | 3.00 | 2.75 | 3.00 | 3.50 | F9 | |
| | F10 | 1.75 | 3.25 | 3.25 | 2.00 | 2.75 | 3.00 | 3.00 | 3.25 | 3.25 | 0 | 2.25 | 2.25 | 2.75 | F10 | |
| PATIENT-SIDE | F11 | 2.75 | 2.75 | 2.75 | 2.50 | 2.25 | 2.00 | 2.50 | 2.50 | 2.75 | 2.50 | 0 | 1.50 | 2.25 | F11 | PATIENT-SIDE |
| Factors | F12 | 2.25 | 1.50 | 1.75 | 3.00 | 2.25 | 2.25 | 3.50 | 2.00 | 2.50 | 2.75 | 2.50 | 0 | 3.00 | F12 | Factors |
| | F13 | 2.50 | 1.75 | 1.75 | 3.00 | 2.00 | 1.75 | 3.25 | 2.50 | 1.75 | 2.75 | 2.00 | 2.50 | 0 | F13 | |
| | | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | | |
| | | ORGANISATION-SIDE FACTORS | | | | | | | | | | PATIENT-SIDE FACTORS | | | | |

The element's influence in each row is exerted on the element in each matrix column and represented as a *fuzzy* number. Table 5.9 shows the *fuzzy* scale used in the model.

## Table 5.9. *Fuzzy* scale

| Code | Linguistic terms | L | M | U |
|---|---|---|---|---|
| 1 | No influence | 0 | 0 | 0.25 |
| 2 | Very low influence | 0 | 0.25 | 0.5 |
| 3 | Low influence | 0.25 | 0.5 | 0.75 |
| 4 | High influence | 0.5 | 0.75 | 1 |
| 5 | Very high influence | 0.75 | 1 | 1 |

Table 5.10 shows the resulting *fuzzy* direct-relation matrix.

## Table 5.10. The *fuzzy* direct-relation matrix

| | Appetite for change | Available funding | Governance | Industry structure | Strategic intent | Provider relationships | Systems integration | Change readiness | Systems & processes | Accountability | Systems intent | Systems capability | Technology acceptance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appetite for change | (0.000,0.000,0.000) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) |
| Available funding | (0.000,0.000,0.250) | (0.000,0.000,0.000) | (0.000,0.000,0.250) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.000,0.250) | (0.000,0.250,0.500) | (0.500,0.750,1.000) | (0.250,0.500,0.750) |
| Governance | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.000,0.000) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) |
| Industry structure | (0.000,0.250,0.500) | (0.000,0.000,0.250) | (0.000,0.000,0.250) | (0.000,0.000,0.000) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) |
| Strategic intent | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.000,0.000) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) |
| Provider relationships | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.000,0.000,0.000) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.250,0.500,0.750) |
| Systems integration | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.000,0.250) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.000,0.000) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) |
| Change readiness | (0.500,0.750,1.000) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.000,0.000) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) |
| Systems & processes | (0.000,0.000,0.250) | (0.000,0.250,0.500) | (0.000,0.000,0.250) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.000,0.000) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) |
| Accountability | (0.000,0.000,0.250) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.250,0.500,0.750) | (0.000,0.000,0.000) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) |
| Systems intent | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.000,0.000) | (0.000,0.000,0.250) | (0.000,0.250,0.500) |
| Systems capability | (0.000,0.250,0.500) | (0.000,0.000,0.250) | (0.000,0.000,0.250) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.000,0.000) | (0.250,0.500,0.750) |
| Technology acceptance | (0.000,0.250,0.500) | (0.000,0.000,0.250) | (0.000,0.000,0.250) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.000,0.250) | (0.250,0.500,0.750) | (0.000,0.250,0.500) | (0.000,0.000,0.250) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.250,0.500) | (0.000,0.000,0.000) |

**Step 2: Normalise the *fuzzy* direct-relation matrix**

Obtain the normalised *fuzzy* direct-relation matrix using the formula:

$$\tilde{x}_{ij} = \frac{\tilde{z}_{\mathrm{ij}}}{r} = \left(\frac{l_{ij}}{r}, \frac{m_{ij}}{r}, \frac{u_{ij}}{r}\right)$$

Where:

$$r = \max_{i,j}\left\{\max_{i}\sum_{j=1}^{n} u_{ij}\,, \max_{j}\sum_{i=1}^{n} u_{ij}\right\}\ i, j \in \{1,2,3,\ldots,n\}$$

Table 5.11 shows the resulting normalised *fuzzy* direct-relation matrix.

**Table 5.11. The normalised *fuzzy* direct-relation matrix**

| | Appetite for change | Available funding | Governance | Industry structure | Strategic intent | Provider relationships | Systems integration | Change readiness | Systems & processes | Accountability | Systems intent | Systems capability | Technology acceptance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appetite for change | (0.000,0.000,0.000) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.000,0.024,0.049) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) |
| Available funding | (0.049,0.073,0.098) | (0.000,0.000,0.000) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.024,0.049) |
| Governance | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.000,0.000) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.049,0.073,0.098) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.024,0.049) |
| Industry structure | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.000,0.000) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) |
| Strategic intent | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.000,0.000) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.024,0.049) | (0.000,0.024,0.049) |
| Provider relationships | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.000,0.000) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.024,0.049) | (0.000,0.024,0.049) |
| Systems integration | (0.049,0.073,0.098) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.000,0.000,0.000) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) |
| Change readiness | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.000,0.000) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) |
| Systems & processes | (0.000,0.024,0.049) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.000,0.000) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) |
| Accountability | (0.000,0.024,0.049) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.000,0.000) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) |
| Systems intent | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.000,0.000) | (0.024,0.049,0.073) | (0.000,0.024,0.049) |
| Systems capability | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.000,0.024,0.049) | (0.000,0.000,0.000) | (0.024,0.049,0.073) |
| Technology acceptance | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.049,0.073,0.098) | (0.024,0.049,0.073) | (0.000,0.024,0.049) | (0.024,0.049,0.073) | (0.000,0.000,0.000) |

**Step 3: Calculate the *fuzzy* total-relation matrix**

The following formula calculates the *fuzzy* total-relation matrix:

$$\tilde{T} = \lim_{k\to+\infty}(\tilde{x}^1 \oplus \tilde{x}^2 \oplus \ldots \oplus \tilde{x}^k)$$

If each element of the *fuzzy* total-relation matrix is expressed as $\tilde{t}_{\mathrm{ij}} = (\mathrm{l}^{\text{“}}_{\mathrm{ij}}, \mathrm{m}^{\text{“}}_{\mathrm{ij}}, \mathrm{u}^{\text{“}}_{\mathrm{ij}})$, it can be calculated as follows:

$$[l^{\text{“}}_{ij}] = x_l \times (I - x_l)^{-1}$$

$$[m^{\text{“}}_{ij}] = x_m \times (I - x_m)^{-1}$$

$$[u^{\text{“}}_{ij}] = x_u \times (I - x_u)^{-1}$$

In other words, the normalised matrix, the inverse, is first calculated and then subtracted from matrix I. Finally, the normalised matrix is multiplied by the resulting matrix. Table 5.12 shows the *fuzzy* total-relation matrix.

**Table 5.12. The *fuzzy* total-relation matrix**

| | Appetite for change | Available funding | Governance | Industry structure | Strategic intent | Provider relationships | Systems integration | Change readiness | Systems & processes | Accountability | Systems intent | Systems capability | Technology acceptance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Appetite for change** | (0.000,0.000,0.000) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) |
| **Available funding** | (0.000,0.000,0.029) | (0.000,0.000,0.000) | (0.000,0.000,0.029) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.000,0.029) | (0.000,0.029,0.059) | (0.059,0.088,0.118) | (0.029,0.059,0.088) |
| **Governance** | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.000,0.000) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) |
| **Industry structure** | (0.000,0.029,0.059) | (0.000,0.000,0.029) | (0.000,0.000,0.029) | (0.000,0.000,0.000) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) |
| **Strategic intent** | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.000,0.000) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) |
| **Provider relationships** | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.000,0.000,0.000) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.029,0.059,0.088) |
| **Systems integration** | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.000,0.029) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.000,0.000) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) |
| **Change readiness** | (0.059,0.088,0.118) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.000,0.000) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) |
| **Systems & processes** | (0.000,0.000,0.029) | (0.000,0.029,0.059) | (0.000,0.000,0.029) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.000,0.000) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) |
| **Accountability** | (0.000,0.000,0.029) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.029,0.059,0.088) | (0.000,0.000,0.000) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) |
| **Systems intent** | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.000,0.000) | (0.000,0.000,0.029) | (0.000,0.029,0.059) |
| **Systems capability** | (0.000,0.029,0.059) | (0.000,0.000,0.029) | (0.000,0.000,0.029) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.000,0.000) | (0.029,0.059,0.088) |
| **Technology acceptance** | (0.000,0.029,0.059) | (0.000,0.000,0.029) | (0.000,0.000,0.029) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.000,0.029) | (0.029,0.059,0.088) | (0.000,0.029,0.059) | (0.000,0.000,0.029) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.029,0.059) | (0.000,0.000,0.000) |

**Step 4: Defuzzify into crisp values**

The CFCS (Combined *Fuzzy* Connectedness and Similarity) method is a technique proposed by Jang (1993) for obtaining a crisp total-relation matrix value in multi-criteria decision-making (MCDM) problems. The method combines *fuzzy* connectedness and similarity measures to obtain the crisp total-relation matrix.

In multi-criteria decision-making (MCDM), the total-relation matrix represents the relationships between the alternatives and the criteria. The matrix elements are typically *fuzzy* numbers, as the relationships between the options and the criteria are often uncertain or vague. One approach to transforming these *fuzzy* numbers into crisp values is the Combined Fuzzy Connectedness and Similarity (CFCS) method, which aims to make them more suitable for decision-making (Tuzkaya et al., 2010). The CFCS method defines a *fuzzy* connectedness measure between each pair of alternatives, which determines the degree of similarity between the options in terms of their relationships with the criteria. Next, a similarity measure determines the similarity between each pair of criteria. Finally, these measures are combined to obtain the crisp value of the total-relation matrix (Tuzkaya).

Other methods proposed for MCDM problems that involve *fuzzy* sets include the *fuzzy* Analytic Network Process (ANP). For example, Yüksel and Dağdeviren (2010) used the *fuzzy* ANP to implement a manufacturing firm's Balanced Scorecard (BSC) framework. Their study demonstrates that the *fuzzy* ANP method is useful for decision-making in complex and uncertain environments. Overall, these studies highlight the importance of considering the uncertainty and vagueness of decision-making in real-world

applications and demonstrate the usefulness of *fuzzy* MCDM methods for addressing such problems. The CFCS method proposed by Jang (1993) obtains the crisp value of the total-relation matrix as follows:

$$l_{ij}^{n} = \frac{\left(l_{ij}^{t} - \min l_{ij}^{t}\right)}{\Delta_{min}^{max}}$$

$$m_{ij}^{n} = \frac{(m_{ij}^{t} - min\ l_{ij}^{t})}{\Delta_{min}^{max}}$$

$$u_{ij}^{n} = \frac{(u_{ij}^{t} - min\ l_{ij}^{t})}{\Delta_{min}^{max}}$$

So that $\Delta_{min}^{max} = \max u_{ij}^{t} - \min l_{ij}^{t}$

Calculating the upper and lower bounds of normalised values:

$$l_{ij}^{s} = {m_{ij}^{n}}\Big/{(1 + m_{ij}^{n} - l_{ij}^{n})}$$

$$u_{ij}^{s} = {u_{ij}^{n}}\Big/{(1 + u_{ij}^{n} - l_{ij}^{n})}$$

The output of the CFCS algorithm is crisp values.

Calculating total normalised crisp values:

$$x_{ij} = \frac{[l_{ij}^{s}\left(1 - l_{ij}^{s}\right) + u_{ij}^{s} \times u_{ij}^{s}]}{[1 - l_{ij}^{s} + u_{ij}^{s}]}$$

**Step 5: Set the threshold value**

A threshold value is required to calculate the internal relations matrix, which neglects the partial relations when plotting the network relationship map (NRM), i.e. matrix T values are zeroed if they are less than the threshold, effectively removing factors with only a tiny impact. Calculating the average values of the matrix T is sufficient to compute the threshold value for relations (Chen et al., 2023). In this study, the threshold value is 0.1180.118. Consequently, every value in matrix T below this is set to zero. The resulting model of significant relations is in Table 5.13.

**Table 5.13. The crisp total-relationships matrix (considering the threshold value)**

| | Appetite for change | Available funding | Governance | Industry structure | Strategic intent | Provider relationships | Systems integration | Change readiness | Systems & processes | Accountability | Systems intent | Systems capability | Technology acceptance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appetite for change | 0.000 | 0.131 | 0.119 | 0.159 | 0.128 | 0.148 | 0.172 | 0.151 | 0.131 | 0.000 | 0.129 | 0.162 | 0.166 |
| Available funding | 0.000 | 0.000 | 0.000 | 0.000 | 0.137 | 0.132 | 0.153 | 0.000 | 0.000 | 0.000 | 0.000 | 0.169 | 0.149 |
| Governance | 0.000 | 0.000 | 0.000 | 0.154 | 0.150 | 0.121 | 0.168 | 0.149 | 0.155 | 0.139 | 0.152 | 0.132 | 0.137 |
| Industry structure | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.151 | 0.000 | 0.138 | 0.000 | 0.136 | 0.141 | 0.147 |
| Strategic intent | 0.000 | 0.131 | 0.000 | 0.131 | 0.000 | 0.147 | 0.171 | 0.150 | 0.155 | 0.000 | 0.152 | 0.160 | 0.165 |
| Provider relationships | 0.000 | 0.000 | 0.000 | 0.126 | 0.147 | 0.000 | 0.165 | 0.146 | 0.151 | 0.136 | 0.122 | 0.129 | 0.159 |
| Systems integration | 0.133 | 0.000 | 0.000 | 0.153 | 0.147 | 0.144 | 0.000 | 0.122 | 0.151 | 0.000 | 0.149 | 0.156 | 0.163 |
| Change readiness | 0.162 | 0.000 | 0.122 | 0.158 | 0.152 | 0.124 | 0.148 | 0.000 | 0.157 | 0.000 | 0.154 | 0.161 | 0.141 |
| Systems & processes | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.148 | 0.000 | 0.000 | 0.124 | 0.000 | 0.139 | 0.144 |
| Accountability | 0.000 | 0.125 | 0.000 | 0.122 | 0.120 | 0.140 | 0.161 | 0.143 | 0.149 | 0.000 | 0.120 | 0.127 | 0.130 |
| Systems intent | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Systems capability | 0.000 | 0.000 | 0.000 | 0.135 | 0.000 | 0.000 | 0.145 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.141 |
| Technology acceptance | 0.000 | 0.000 | 0.000 | 0.126 | 0.000 | 0.000 | 0.133 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**Step 6: Final output and create a causal relation diagram**

The next step is determining the sum of each row and each column of T (from step 4). Calculating the sum of rows (D) and columns (R) is as follows:

$$D = \sum_{j=1}^{n} T_{ij} \qquad R = \sum_{i=1}^{n} T_{ij}$$

Then, the (D+R) values represent the degree of importance of factor i in the entire system, and (D-R) values represent the net effects that factor *i* contributes to the system. The values of D+R and D-R are in Table 5.14. The D+R value represents the degree of importance of factor i in the system, and D-R represents the net effects that factor *i* contributes to the system.

**Table 5.14. Importance (D+R) and net effect (D-R) of each factor**

| | R | D | D+R | D-R |
|---|---|---|---|---|
| Appetite for Change | 1.280 | 1.793 | 3.073 | 0.513 |
| Available Funding | 1.220 | 1.446 | 2.666 | 0.226 |
| Governance | 1.007 | 1.734 | 2.740 | 0.727 |
| Industry Structure | 1.674 | 1.439 | 3.113 | -0.235 |
| Strategic Intent | 1.588 | 1.778 | 3.366 | 0.190 |
| Provider Relationships | 1.514 | 1.671 | 3.184 | 0.157 |
| Systems Integration | 1.940 | 1.711 | 3.652 | -0.229 |
| Change Readiness | 1.574 | 1.799 | 3.373 | 0.225 |
| Systems and Processes | 1.659 | 1.376 | 3.035 | -0.283 |
| Accountability | 1.384 | 1.609 | 2.993 | 0.225 |
| Systems Intent | 1.601 | 1.197 | 2.798 | -0.403 |
| Systems Capability | 1.735 | 1.319 | 3.053 | -0.416 |
| Technology Acceptance | 1.818 | 1.123 | 2.941 | -0.695 |

Source: The Author

## 5.9. Causal relationships

As described above, the *fuzzy DEMATEL* method quantifies causal relationships among the factors by considering the degree of uncertainty and vagueness of the expert's judgments (Mardani et al., 2015). The technique generates a causal diagram representing the identified relationships and cause-and-effect between different factors related to the research topic. Table 5.15 ranks each factor in decreasing order of overall influence, indicates its position in the NOM decision framework and whether the factor is causal or effect.

**Table 5.15. Degree of influence of identified factors (ranking)**

| Factor | Overall Influence (rank) | System Influence (rank) | Average Rank | Causal/ Effect | Framework Position (NOM) |
|---|---|---|---|---|---|
| Systems Integration | 1 | 8 | 4.5 | Effect | Org-level (Adoption) Factors – Organisation-side |
| Change Readiness | 2 | 5 | 3.5 | Causal | Mngt-level (Implementation) Factors – Organisation-side |
| Strategic Intent | 3 | 6 | 4.5 | Causal | Org-level (Adoption) Factors – Organisation-side |
| Provider Relationships | 4 | 7 | 5.5 | Causal | Org-level (Adoption) Factors – Organisation-side |
| Industry Structure | 5 | 9 | 7 | Effect | Natl-level (Acceptance) Factors – Organisation-side |
| Appetite for Change | 6 | 2 | 4 | Causal | Natl-level (Acceptance) Factors – Organisation-side |
| Systems Capability | 7 | 12 | 9.5 | Effect | Org-level (Adoption) Factors – Patient-side |
| Systems and Processes | 8 | 10 | 9 | Effect | Mngt-level (Implementation) Factors – Organisation-side |

| Factor | Overall Influence (rank) | System Influence (rank) | Average Rank | Causal/ Effect | Framework Position (NOM) |
|---|---|---|---|---|---|
| Accountability | 9 | 4 | 6.5 | Causal | Mngt-level (Implementation) Factors – Organisation-side |
| Technology Acceptance | 10 | 13 | 11.5 | Effect | Mngt-level (Implementation) Factors – Patient-side |
| Systems Intent | 11 | 11 | 11 | Effect | Org-level (Adoption) Factors – Patient-side |
| Governance | 12 | 1 | 6.5 | Causal | Natl-level (Acceptance) Factors – Organisation-side |
| Available Funding | 13 | 3 | 8 | Causal | Natl-level (Acceptance) Factors – Organisation-side |

Source: The Author

The top-ranked factor of importance in the system is *Systems Integration*. This Organisation-level (Adoption) factor, which appears on the organisation side of the NOM decision framework, concerns senior stakeholders in provider organisations. It is also an effect factor ranked 8th for the net effects it contributes to the system. *Systems Integration* concerns:

- Proactive-care platforms (e.g., telehealth)
- Integrated healthcare systems
- Common data standards across partner organisations

The second-ranked factor of importance is *Change Readiness*. This Management-level (Implementation) factor, which appears on the organisation side of the framework, is of day-to-day concern to managers of provider organisations. It is also a causal factor ranked 5th for the net effects it contributes to the system. *Change Readiness* concerns:

- Top management support
- Clinicians' attitude to the new business model
- Managers' perception of the need to change
- Funding incentives

- Unconscious bias
- Staff morale

The third-ranked factor of importance is *Strategic Intent*. This Organisation-level (Adoption) factor, which appears on the organisation side of the framework, is of concern to senior stakeholders in provider organisations. It is also a causal factor ranked 6th for the net effects it contributes to the system. *Strategic Intent* concerns:

- Upfront investment
- Attitude to patients
- Cooperation with other providers
- Services coordinated for each clinical area

The fourth-ranked factor of importance is *Provider Relationships*. This Organisation-level (Adoption) factor, which appears on the organisation side of the framework, is of concern to senior stakeholders in provider organisations. It is also a causal factor ranked 7th for the net effects it contributes to the system. *Provider Relationships* concerns:

- Shared physical resources
- Shared intellectual resources
- Health burden shared with allied health providers (e.g. pharmacists)

The fifth-ranked factor of importance is *Industry Structure*. This National-level (Acceptance) factor, which appears on the organisation side of the framework, is of concern to the highest-level stakeholders. It is also an effect factor ranked 9th for the net effects it contributes to the system. *Industry Structure* concerns:

- Decentralised and independent healthcare entities
- The National Health Information Platform (Hira) and Telehealth

The sixth-ranked factor of importance is *Appetite for change*. This National-level (Acceptance) factor, which appears on the organisation side of the framework, is of concern to the highest-level stakeholders. It is also a causal factor ranked 2nd for the net effects it contributes to the system. *Appetite for change* concerns:

- Medical Council attitude
- Provider attitude
- Policymakers' appetite for change

- Government support for the effort
- Nationwide Internet provision

The seventh-ranked factor of importance is *Systems Capability*. This Organisation-level (Adoption) factor is provider-driven and appears on the patient side of the framework. It is also an effect factor ranked 12th for the net effects it contributes to the system. *Systems Capability* concerns:

- IT platforms that offer convenience

The eighth-ranked factor of importance is *Systems and Processes*. This Management-level (Implementation) factor, which appears on the organisation side of the framework, is of day-to-day concern to managers of provider organisations. It is also an effect factor ranked 10th for the net effects it contributes to the system. *Systems and Processes* concerns:

- Decision support capability
- Trust in the system information

The ninth-ranked factor of importance is *Accountability*. This Management-level (Implementation) factor, which appears on the organisation side of the framework, is of day-to-day concern to managers of provider organisations. It is also a causal factor ranked 4th for the net effects it contributes to the system. *Accountability* concerns:

- Transparent end-to-end accountability

The tenth-ranked factor of importance is *Technology Acceptance*. This Management-level (Implementation) factor, which appears on the patient side of the framework, is of day-to-day concern to patients. It is also an effect factor ranked 13th for the net effects it contributes to the system. *Technology Acceptance* concerns:

- Trust in the healthcare system
- Access to a smart device/phone
- Cost

The eleventh-ranked factor of importance is *Systems Intent*. This Organisation-level (Adoption) factor is provider-driven and appears on the patient side of the framework. It is also an effect factor ranked 11th for the net effects it contributes to the system. *Systems Intent* concerns:

- Communication of strategic change
- Quality of the health care outcome

The twelfth-ranked factor of importance is *Governance*. This National-level (Acceptance) factor, which appears on the organisation side of the framework, is of concern to the highest-level stakeholders. It is also a causal factor ranked 1st for the net effects it contributes to the system. *Governance* concerns:

- Agreement on governance and consent
- Recent health and disability review outcomes/pending legislation
- Quality of leadership
- Quality of communication

Finally, the thirteenth-ranked factor of importance is *Available Funding*. This National-level (Acceptance) factor, which appears on the organisation side of the framework, is of concern to the highest-level stakeholders. It is also a causal factor ranked 3rd for the net effects it contributes to the system. *Available Funding* concerns:

- Sector funding amount
- Agreed division of resources
- Targeted funding for the highest needs

Recalling that the horizontal vector (D + R) represents each factor's importance in the system, (D + R) indicates both factor i's impact on the whole system and other system factors' effect on the factor. The vertical vector (D-R) represents the degree of a factor's influence on the system. In general, positive values of D-R represent a causal variable, and negative values of D-R represent an effect.

Thus, this study's findings show that appetite *for change, Available funding, Governance, Strategic intent, Provider relationships, Change readiness,* and *Accountability* are all causal variables. Conversely, *Industry structure, Systems integration, Systems and processes, Systems intent, Systems capability,* and *Technology acceptance* are all effects.

Accordingly, Figure 5.2 shows the model of significant relations, in which increasing values of (D+R) on the horizontal axis indicate increasing influence. The position on the vertical axis indicates whether the factor is causal (positive values) or is an effect (negative values). Values of (D-R) close to zero indicate relatively weak factors.

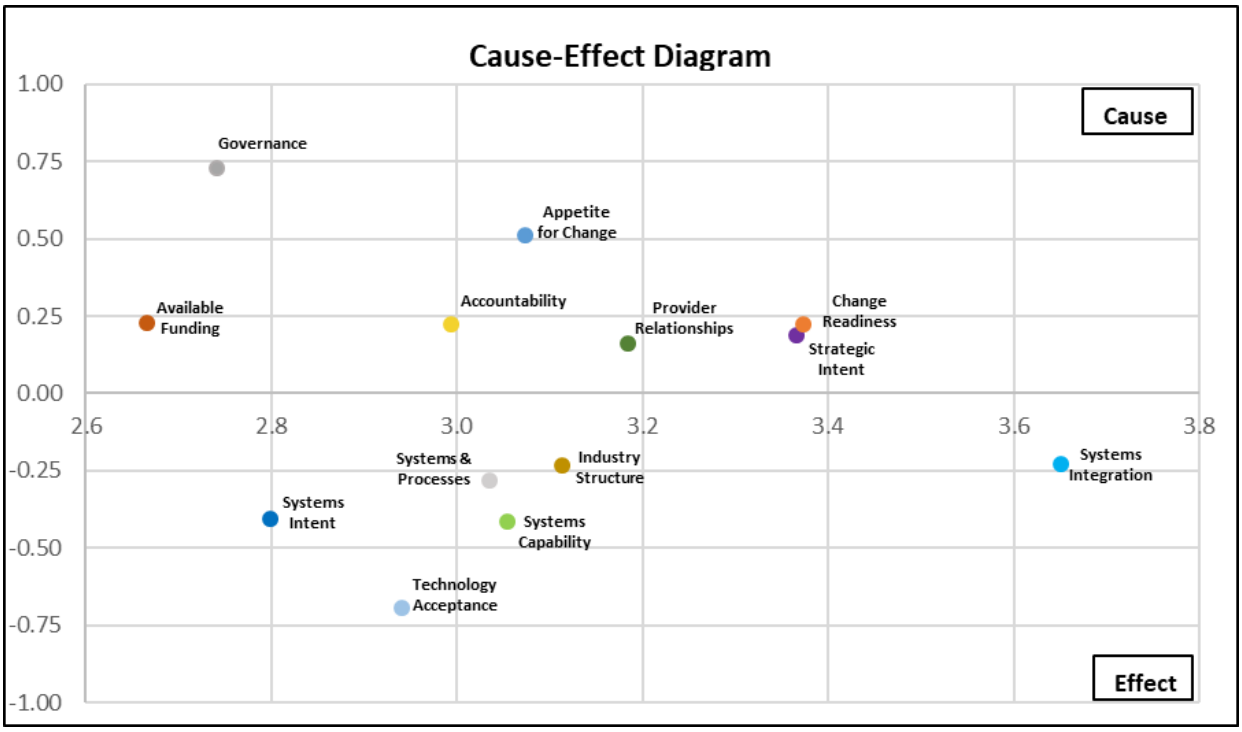



**Figure 5.2. Cause-effect diagram**

Source: The Author

In summary, the causal and effect factors map to the National/Organisation/Management (NOM) decision framework, as indicated in Table 5.16, below.

**Table 5.16. NOM factor mapping**

| **Causal factor:** | | | |
|---|---|---|---|
| **Organisation-side** | **Importance (Rank)** | **Patient-Side** | **Rank** |
| National-level (Acceptance): (NLAO) | | National-level (Acceptance): (NLAP) | |
| *Appetite for change* | 6 | - | - |
| *Available funding* | 13 | | |
| *Governance* | 12 | | |
| Organisation-level (Adoption): (OLAO) | | Organisation-level (Adoption): (OLAP) | |
| *Strategic Intent* | 3 | - | - |
| *Provider Relationships* | 4 | | |
| Management-level (Implementation): (MLIO) | | Management-level (Implementation): (MLIP) | |
| *Change Readiness* | 2 | - | - |
| *Accountability* | 9 | | |
| **Effect factors:** | | | |
| National-level (Acceptance): (NLAO) | | National-level (Acceptance): (NLAP) | |
| *Industry Structure* | 5 | - | - |
| Organisation-level (Adoption): (OLAO) | | Organisation-level (Adoption): (OLAP) | |
| *Systems Integration* | 1 | *Systems Intent* | 11 |
| | | *Systems Capability* | 7 |
| Management-level (Implementation): (MLIO) | | Management-level (Implementation): (MLIP) | |
| *Systems and Processes* | 8 | *Technology Acceptance* | 10 |

Source: The Author

The Pareto principle states that for many outcomes, roughly 80% of consequences arise from 20% of causes (Pareto, 1897). Utilising this principle yielded valuable insights into the relationships between the factors identified. Figure 5.3 applies this rule to the top 20% of influencers (obtained via conditional formatting of the values in the crisp total relation matrix). The diagram helps to confirm the findings regarding the primary causes and effects of the ideal healthcare system. For example, the causal factor *Governance* is ranked first for overall system influence, with *Appetite for Change* ranked second.

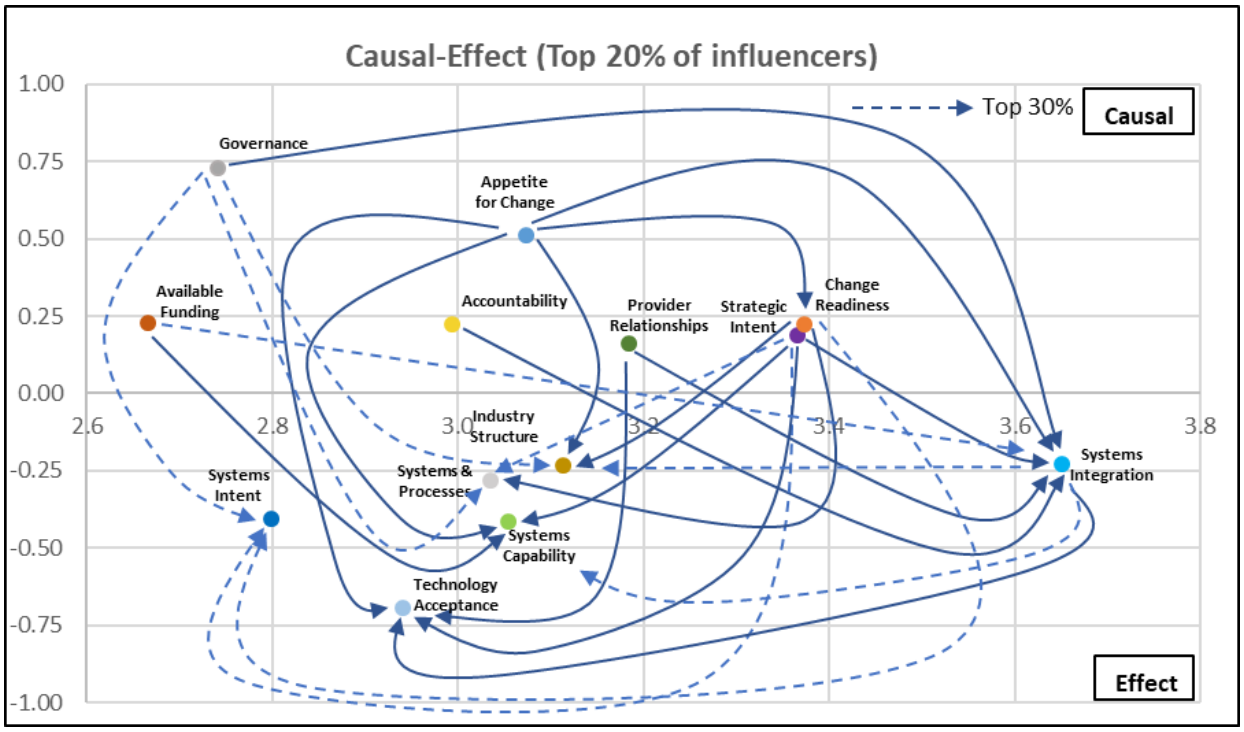



**Figure 5.3. Cause-effect (top influencers)**

Source: The Author

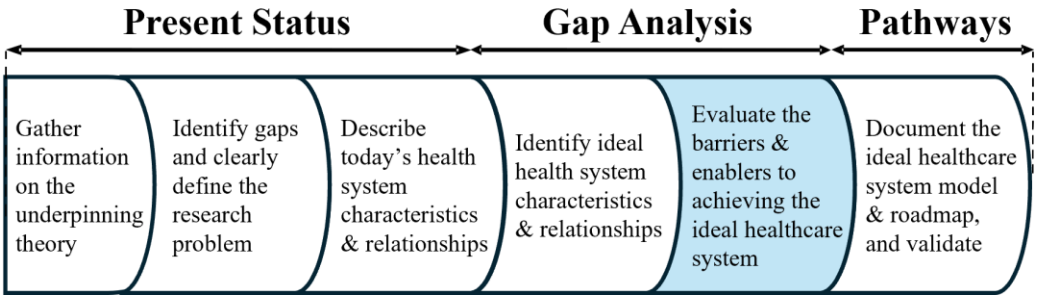
Such diagrams provide an understanding of New Zealand's healthcare system dynamics as the expert panel perceives it. This approach aligns with recent work by Paine and Foote (2024), which utilises a Viable System Model (VSM) to diagnose health system disconnects between governance, management, and operations. Essentially, it indicates where effort can achieve desirable impacts. For example, *Systems Integration* (proactive-care platforms, integrated healthcare systems, and shared data standards across partner organisations) is influenced partly by *Available Funding* (sector funding amount, agreed division of resources, targeted funding for highest needs) and *Appetite for Change* (concerned with Medical Council attitude, provider attitude, and policymaker appetite for change). The dashed lines add in the top 30% of influencers' roles to help explain some of the otherwise 'orphaned' factors.

## 5.10. Conclusion

The Delphi study played a pivotal role in scoping and shaping the research. The panels of experts contributed valuable insights, allowing a nuanced understanding of the research domain and identifying prominent themes and trends. On the other hand, while the Delphi survey provides a robust foundation, it is inherently limited due to its inability to capture the intricacies of individual experiences and perspectives. Phase 2 of the research addressed these limitations and gained a more comprehensive understanding.

# Chapter 6: Findings: Research Phase 2—Semi-structured Interviews

## 6.1. Introduction




This chapter details how a rigorous interview procedure and thematic analysis elicited insights from executive leaders within the five Midland Regional DHBs, especially around understanding the obstacles and enablers of implementing the ideal healthcare system. The juxtaposition of expert opinions garnered through the Delphi method with the lived experiences articulated in the interview narratives provided a more nuanced and well-rounded interpretation of the research landscape. Exploring manager insights and perceptions facilitated the triangulation of data from multiple methodological streams, with results expected to offer additional valuable contributions to knowledge and novel perspectives on the research area, thereby contributing to a more comprehensive, in-depth understanding.

## 6.2. Semi-structured interviews

Semi-structured interviews are a hybrid of structured (based on a rigid set of interview questions) and unstructured (typically broad questions based on themes) interview questions, in which the researcher may vary the themes and questions between interviews (Wilson, 2014). The question order may also vary depending on the flow of discussion, or additional questions may be required to satisfy the research objectives. The developed interview guide with seed questions is in **Appendix G**. Because some questions were open-ended, the interviews were audio-recorded and notated to ensure the identification of the essential discussion threads for reflection and analysis.

## 6.3. Sample selection and recruitment

The sample selection process for the semi-structured interviews contrasted with that for the Delphi study, which had centred on Telehealth professionals from across the health sector. Given the research objective of understanding the obstacles and enablers of implementing an ideal healthcare system in New Zealand

from the executive leadership perspective, the study involved interviews with a representative cross-section of executives. This sample included Chief Executives, Chief Financial Officers, Chief Medical Officers, Chief Information Officers, and Chief Operating Officers from five DHBs within the Midland Region of New Zealand. These numbers were determined based on achieving theoretical saturation and ensuring diverse perspectives. Thus, while having more participants would yield more views due to regional nuances, the overarching themes identified are unlikely to change.

**Appendix H** contains the invitation sent to the Chief Executives.

Although the objectives of this research concern the perceptions and beliefs of individuals, dyads, and groups, the focus on producer/consumer organisation relationships led to selecting a group-level unit of analysis. Hence, the *Operational Leadership Board* (OLB) of the District Health Board, the highest level of operational decision-making within a DHB organisation, was the unit of analysis for this study phase. OLB activities contrast with the higher-level governance activities of the board of elected and non-elected officials. The participants for the semi-structured interviews are in Table 6.1. Unfortunately, COVID-19 restrictions played a part in limiting the number of interviewees.

**Table 6.1. Interview participants**

| Position |
|---|
| Chief Medical Officer |
| Chief Operating Officer |
| Chief Information Officer |
| GM Hauora Māori |
| Chief Executive |

Source: The Author

## 6.4. Conducting the interviews

The NOM decision framework factors identified during the Delphi study informed the interview choice of open-ended (seed) questions. Due to COVID-19 restrictions, online Zoom discussions occasionally replaced the preferred face-to-face interviews. After receiving consent from the DHB Chief Executive to access the site and the executive team members, each prospective interviewee received a participation information sheet and a consent form (included in **Appendix I** and **Appendix J**).

Following the ethics committee's approval to conduct the interviews (**Appendix K**), the interviews could proceed. The Participation Information Sheet introduced the research topic, explained the purpose of the

interview, and sought informed consent from the participants. Before signing the consent form, every participant received a script that reintroduced the topic, outlined the likely duration, reconfirmed confidentiality, and requested that the interview be audio-recorded. The researcher transcribed the interviews using audio-to-text conversion software.

Avoiding researcher bias was achieved as follows (Principe, 2022):

- **Multiple coders interpreted the data.** Using multiple people to code data is an effective strategy for knowing if one's interpretation is consistent with another person's understanding. Bringing new perspectives to the study helps determine if the data agrees with the researcher's hypothesis.
- **External review of the work**. An external peer review helps reveal questions that need modification and gaps in arguments that need addressing. A fresh pair of eyes, in this case, the Chief Supervisor's, allowed the researcher to identify bias-causing issues.
- **The researcher's role was acknowledged**. Ethical approval from the university required critical self-reflection throughout the research and consideration of how the researcher's identity might impact findings. Consistent use of research protocols provided transparency about methods and interpretations so that respondents and readers could appreciate the logic behind the research process.
- **Triangulated data sources**. Secondary sources and extensive experience helped verify whether the primary data was valid and reliable.
- **Participants evaluated the findings**. Participant feedback was sought on the findings at each study stage and during the final validation phase.

## 6.5. Data analysis

### 6.5.1. Thematic analysis

Coding was associated with the themes identified from participant responses to each question during the earlier Delphi study to identify linkages and enhancements to the NOM decision framework using the methodological framework and theoretical foundations described in this thesis and to determine the level of support for the earlier findings. An example of thematic coding with NVivo is in **Appendix L**.

After consolidating the main topics arising from each interview question, the following eight themes commonly emerged across the questions:

1. Patient-centred care and improved access
2. Addressing inequities
3. Transforming the healthcare system
4. Integration and collaboration
5. Financial investment and resource management
6. Technology and digital solutions
7. Leadership, change culture, and management
8. Continuous improvement and efficiency

These have critical relevance to a successful healthcare transformation in New Zealand. Each theme represents a distinct focus area warranting exploration and examination to fully understand the challenges, opportunities, and strategies of transforming the traditional patient pipeline into a patient-centred, equitable and efficient platform-based (sharing economy) healthcare system.

1. **Patient-centred care and improved access:** The need for patient-centred care was a central theme across the interviews, emphasising the need to prioritise patient needs and preferences in healthcare delivery, for example, improving access to care, especially regarding home care support and post-discharge care. The interviews also confirmed the importance of addressing barriers to access, such as the limited availability of general practitioner (GP) services in rural areas.

| Interviewee | Direct Quote |
|---|---|
| **002** | "Access to care with less focus on prevention/wellness and more dollars spent on the high-end stuff in Hospital and Specialist Services (HSS). Access is minimal, with many practices closed to new enrolments, limiting access to GP services." |
| **015** | Getting the balance right between face-to-face interaction and what can be conducted virtually. We must have that balance and be able to choose when they have their appointments and patient-generated attendances, and if consults can be performed face to face or virtually." |
| **011** | "Patient-centred care—listening to patients' needs rather than telling them what their needs are to deliver care. Putting patients in control vs. clinicians telling is a change in the power imbalance. Universal, targeted, and specialist intervention for developmental problems without introducing new areas of waste." |
| **020** | "Equitable access is the minimum. Equitable access and care then become patient centred." |
| **022** | "The ideal system would be one where you could engage with our communities to achieve equitable access and patient-centred care." |

Enhancing access to healthcare services through innovative approaches and technology platform solutions was reported as crucial for improving patient outcomes and experiences. Efforts should focus on reducing disparities in healthcare outcomes and ensuring that all individuals, regardless of background or location, have equal opportunities to access high-quality care.

2. **Addressing inequities:** Achieving equity in healthcare requires a comprehensive approach beyond simply addressing access issues. The interviews emphasised the need to address healthcare inequities, particularly for marginalised populations such as Māori, Pacifica, and rural communities. Given some concerns about potential shifts from a one-sided Western model to a one-sided indigenous model, there is a need to balance equity-focused reforms with comprehensive healthcare provision.

| Interviewee | Direct Quote |
|---|---|
| **014** | "Because serious inequities exist, it is completely broken. Māori, Pacifica, and other vulnerable peoples and rural populations may not be able to access what urban populations enjoy. Particularly, that is the case in primary care. There is an overly political focus, and by that, I mean that the issue around planned care, for example, has a strong political focus where they want to measure the number of waiting lists, etc. However, the actual number of acute cases we deal with does not get the same level of political notice, so there is a bias." |
| **020** | "I consider equity a base foundation requirement of good healthcare rather than a nice-to-have or something we should consider. The foundation on which we should build healthcare is equitable care and equitable access, and I do not think that our system currently treats it as a minimum standard; it treats it as a standard to aim for." |
| **014** | "If you are going to have equitable access, you need to put a lot more of the capability and power in the hands of the consumer." |

3. **Transforming the healthcare system:** The interviews highlighted the urgency for the enduring transformation of the New Zealand healthcare system towards patient-centred care models that place the population at the centre of healthcare delivery. This seismic shift requires the bureaucratic nature of the present system to be addressed via improved planning and coordination across healthcare providers to create a more efficient healthcare system that better meets the needs of patients and delivers improved health outcomes.

| Interviewee | Direct Quote |
|---|---|
| **040** | "I also like the potential, and I stress potential because I do not think it has been done well. One of the things I expected was greater health system integration and interaction between tertiary, secondary and primary care providers due to the mechanism of the unitary government." |
| **003** | "Transformation of the healthcare system needs to focus on the population at the centre, an individual, a family, or an entire community. Having the population at the centre who can engage and participate in the various aspects of care available to them." |
| **011** | "Accountability - how does this translate across the country? There must be accountability that people are jumping on board." |

4. **Integration and collaboration:** Breaking down the present silos within the healthcare system and promoting cooperation and integration between specialties and providers also emerged as a critical theme. The interviews emphasised the importance of shared care and coordination to improve efficiency, reduce duplication, and provide comprehensive and holistic care to patients. Digital solutions like telehealth, shared scheduling systems, and electronic health records are essential tools to facilitate collaboration and integration among healthcare providers.

| Interviewee | Direct Quote |
|---|---|
| **005** | "Get rid of silos within systems and the mentality that one specialty is better than another. Get rid of duplication. Why do people need to travel to a clinic for testing? Can this be done remotely? Telehealth is a BIG enabler. Look at what the person needs and have all their needs met simultaneously vs. multiple visits/clinics." |
| **014** | "Investment in enabling technologies will be important in the data and digital space. In 2017, Health Informatics New Zealand (HINZ) were not discussing electronic health records, and we were still trying to put it in. They talked about virtual health care, bringing wider social agencies together, delivering health care in the home, using technologies, etc. It was just a different mindset." |
| **030** | "We must embrace that we are one national organisation. We need to have that change in mindset. We must collaborate and work more effectively across all stakeholders. There is some work to do in that space." |

5. **Financial investment and resource management:** The interviews revealed concern with the funding models used in the healthcare system and the need for better resource management. They recognised that the existing system is underfunded and requires significant changes to ensure sustainable healthcare delivery. There were also calls for funding models prioritising prevention, community-based services, and primary care over secondary and tertiary care. Furthermore, centralising aspects like asset management and IT infrastructure was suggested to allocate resources more effectively and efficiently.

| Interviewee | Direct Quote |
|---|---|
| **006** | Relationships are the key. Open communication is part of relationships. Consumer-owned and led, it creates different dynamics and a holistic approach, leading to well-being, quality and a redefinition of quality. Cost management and financial trade-offs, as there is limited funding." |
| **014** | "Dedicated funding streams specifically targeted to change. The willingness to fail fast, so if you fail, pull the plug. It takes a degree of bravery to do that. As you know, we live in a political world, but we must be able to say that something did not work without fear of persecution for wasting taxpayer dollars." |
| **040** | "The biggest issue I have had is that New Zealand clinicians do not understand that they are operating in a business. Nor do they understand that they are part of either a platform or a production line. Therefore, they are oblivious to the cost of what they do or the income it may generate, which is a huge contrast to the Australian system." |
| **020** | "Finances. We operate in a financially challenging environment where the traditional gold standard of service delivery needs to be modified so that we live within our means." |

6. **Technology and digital solutions:** The interviews underscored the importance of investing in enabling technologies, data management, and digital healthcare solutions. The rapid advancement of technology provides opportunities to transform healthcare delivery, improve coordination, and enhance access to information. While electronic medical records are a valuable tool, the need to broaden the focus to include virtual healthcare and leverage technology for improved care coordination, shared decision-making, and patient engagement is recognised.

| Interviewee | Direct Quote |
|---|---|
| **020** | "We have a big opportunity in data, digital, and telehealth with data sharing and information flows. A massive opportunity to access data." |
| **014** | "When I look at data and digital across the country, there has been an enormous expenditure on what is often a hygiene factor, and we are still unclear on some of the fundamentals. If every health professional had access to a shared scheduling system, they could see where patients are booked across the sector and potentially book their patients." |

7. **Leadership, change culture, and management:** The interviews revealed concern for cultivating a culture of change within healthcare organisations, which is vital for successful transformation. Furthermore, effective leadership and governance to drive and sustain healthcare reforms require empowered local and indigenous communities to engender relationships built on trust and mutual respect. Indigenous worldviews and perspectives should be recognised and integrated into decision-

making processes. On the other hand, incremental change and a focus on individual services or departments will likely ensure a more successful cultural change throughout the healthcare system.

| Interviewee | Direct Quote |
|---|---|
| **011** | "There needs to be clearer escalation pathways where you cannot get local agreement when trying to do things markedly differently, rationing models, and adaptability and flexibility in how we do things. Within the rationing model, we must change what we focus on for what we pay and prevent system gaming. If you want to change dramatically, how do you maintain your product while addressing shortfalls in funding and activity costing, counting, and payments? What about leadership and focusing on what we pay for?" |
| **002** | "Governance, clinical leadership, communication, and making quite clear the 'why' for the change. Ensuring we have the right resources to deliver the change and investment, especially a technology-based Platform Business Model. Consumers and clinical engagement to develop the right platform. These are the key." |

8. **Continuous improvement and efficiency:** Finally, the interviews underscored the importance of pursuing continuous improvement when transforming the healthcare system. Simplifying processes, reducing service duplication, and streamlining the patient journey might achieve efficiency gains.

| Interviewee | Direct Quote |
|---|---|
| **020** | "A continuously evolving healthcare system that gets the best value from its producers and consumers. It needs to compare continuous improvement versus a static model of care." |
| **004** | "There is always room for improvement. There should be benefits in a joined-up system, but it will take considerable effort to make it work; there is no silver bullet and no free rides. The new system will take effort to make work." |

These eight key themes highlight the multifaceted nature of healthcare transformation and the interconnectedness of the factors. By addressing patient-centred care and improved access, addressing inequities, transforming the healthcare system, integration and collaboration, financial investment and resource management, technology and digital solutions, leadership, culture and change management, and continuous improvement, healthcare systems can work towards creating a more patient-centric, efficient, and sustainable healthcare ecosystem.

***The ideal healthcare system***

Table 6.2 compares the findings from a question common to the Delphi survey and interview participants regarding the principles underpinning their ideal healthcare system: '*How would you rank these (named) components by importance (a value of 1 being least important, and a value of 4 being most important)?'*

**Table 6.2. Ideal healthcare principles (Delphi ranking)**

| **Ranking: 1 = most important; 4 = least important** | ***Delphi*** | ***Interview*** |
|---|---|---|
| **The ideal healthcare system for NZ is founded on the principle of:** | ***Rank*** | ***Rank*** |
| **Equitable access** | **1** | **1** |
| **Shared resources** | **2** | **4** |
| **Integration** | **3** | **3** |
| **Patient-centred care** | **4** | **2** |

Source: The Author

The Delphi survey and interview respondents agree that *equitable access* should be the leading principle underpinning the ideal, transformed New Zealand health system. They also agree that *integration* is the third-ranked principle. In contrast, the Delphi group ranked *shared resources* as the second most important principle, and the interviewees ranked it the least important. Lastly, the Delphi group ranked *patient-centred care* as the least essential principle, and the interviewees ranked it second.

### 6.5.2. Links to the NOM decision framework and enhancements

The National/Organisation/Management (NOM) decision framework in Tables 6.3 and 6.4 indicates where the interview themes offer only minor support for the Delphi study's causal and effect success factors.

**Table 6.3. Confirmed minor support for the NOM (causal) factors**

| Delphi Factor | Organisation-side Effect Factors | Delphi Factor | Patient-Side Effect Factors |
|---|---|---|---|
| **National-level (Acceptance): (NLAO)** | | **National-level (Acceptance): (NLAP)** | |
| **F1** | **Appetite for change**<br>NO5 = Nationwide Internet provision | - | N/A |
| **Organisation-level (Adoption): (OLAO)** | | **Organisation-level (Adoption): (OLAP)** | |
| **F6** | **Provider Relationships**<br>OO7 = Health burden shared with allied health providers (e.g. pharmacists) | - | N/A |
| **Management-level (Implementation): (MLIO)** | | **Management-level (Implementation): (MLIP)** | |
| **F8** | **Change Readiness**<br>MO2 = Clinicians' attitude to the new business model<br>MO4 = Funding incentives<br>MO6 = Staff morale | - | N/A |

Source: The Author

**Table 6.4. Confirmed minor support for the NOM (effect) factors**

| Delphi Factor | Organisation-side Causal Factors | Delphi Factor | Patient-Side Causal Factors |
|---|---|---|---|
| **National-level (Acceptance): (NLAO)** | | **National-level (Acceptance): (NLAP)** | |
| - | - | - | N/A |
| **Organisation-level (Adoption): (OLAO)** | | **Organisation-level (Adoption): (OLAP)** | |
| - | - | | |
| **Management-level (Implementation): (MLIO)** | | **Management-level (Implementation): (MLIP)** | |
| **F9** | **Systems and Processes**<br>MO8 = Trust in system information | **F13** | **Technology Acceptance**<br>MP1 = Trust in the healthcare system<br>MP3 = Cost |

Source: The Author

Conversely, Tables 6.5 and 6.6 indicate where strong interview support exists for the Delphi study's causal and effect success factors. Consequently, this framework is judged suitable for assessing the utility of the ideal health sector transformation espoused by the Delphi survey and interview respondents.

**Table 6.5. Confirmed support for the NOM (causal) factors**

| | Organisation-side Causal Factors | | Patient-Side Causal Factors |
|---|---|---|---|
| **National-level (Acceptance): (NLAO)** | | **National-level (Acceptance): (NLAP)** | |
| **F1** | **Appetite for change**<br>NO1 = Medical Council attitude (T7)<br>NO2 = Provider attitude (T7)<br>NO3 = Policymaker appetite for change (T7)<br>NO4 = Government support for the effort (T2) | - | N/A |
| **F2** | **Available funding**<br>NO6= Sector funding amount (T5)<br>NO7 = Agreed division of resources (T5)<br>NO8 = Targeted funding for highest needs (T5) | | |
| **F3** | **Governance**<br>NO9 = Agreement on governance and consents (T5)<br>NO10 = Recent health and disability review outcomes/pending legislation (T1)<br>NO11 = Quality of leadership (T7)<br>NO12 = Quality of communication (T7) | | |
| **Organisation-level (Adoption): (OLAO)** | | **Organisation-level (Adoption): (OLAP)** | |
| **F5** | **Strategic Intent**<br>OO1 = Upfront investment (T5)<br>OO2 = Attitude to patients (T3)<br>OO3 = Cooperation with other providers (T4)<br>OO4 = Services coordinated for each clinical area (T3) | **F11** | **Systems Intent**<br>OP1 = Communication of strategic change |
| **F6** | **Provider Relationships**<br>OO5 = Shared physical resources (T4)<br>OO6 = Shared intellectual resources (T4) | | |
| **Management-level (Implementation): (MLIO)** | | **Management-level (Implementation): (MLIP)** | |
| **F9** | **Systems and Processes**<br>MO7 = Decision support capability (T7) | - | N/A |
| **F10** | **Accountability**<br>MO9 = Transparent end-to-end accountability (T5) | | |
| **F8** | **Change Readiness** | | |

| | Organisation-side Causal Factors | | Patient-Side Causal Factors |
|---|---|---|---|
| | MO1 = Top management support (T8)<br>MO3 = Managers' perception of the need to change (T8)<br>MO5 = Unconscious bias (T7) | | |

Source: The Author

**Table 6.6. Confirmed support for the NOM (effect) factors**

| | Organisation-side Effect Factors | | Patient-Side Effect Factors |
|---|---|---|---|
| **National-level (Acceptance): (NLAO)** | | **National-level (Acceptance): (NLAP)** | |
| **F4** | **Industry Structure**<br>NO13 = Decentralised and independent healthcare entities (T1)<br>NO14 = The National Health Information Platform (Hira) and Telehealth (T6) | **F12** | **Systems Capability**<br>OP3 = IT platforms that offer convenience (T4) |
| **Organisation-level (Adoption): (OLAO)** | | **Organisation-level (Adoption): (OLAP)** | |
| **F7** | **Systems Integration**<br>OO8 = Proactive-care platforms (telehealth) (T4)<br>OO9 = Integrated healthcare systems (T4)<br>OO10 = Common data standards across partner organisations (T4) | - | N/A |
| **F6** | **Provider Relationships**<br>OO5 = Shared physical resources (T4)<br>OO6 = Shared intellectual resources (T4) | | |
| **Management-level (Implementation): (MLIO)** | | **Management-level (Implementation): (MLIP)** | |
| **F8** | **Change Readiness**<br>MO1 = Top management support (T8)<br>MO3 = Managers' perception of the need to change (T8)<br>MO5 = Unconscious bias (T7) | **F13** | **Technology Acceptance**<br>MP2 = Access to a smart device/phone (T2) |

Source: The Author

## 6.6. Conclusion

The findings contribute to the literature by providing valuable insights into health professionals' views on transformational healthcare in New Zealand. They also provide a starting point for further research into the antecedents of successful implementation in this context. The next chapter describes what this would mean for New Zealand’s healthcare system.

# Chapter 7: The Implications for NZ's Healthcare Sector

## 7.1. Introduction

The preceding chapters have described the extant literature and outlined the characteristics of the ideal healthcare system according to two expert panels and various senior executives, set against the context of New Zealand's present public healthcare sector. Also outlined from the Delphi surveys and semi-structured interviews were the significant barriers and enablers to achieving the ideal.

This chapter uses empirical evidence and extant theory to highlight the main patterns, trends, and critical revelations. Chapters 8 and 9 then use this knowledge as building blocks to construct a nuanced understanding of the ideal healthcare system for New Zealand and an accompanying stakeholder intervention roadmap.

## 7.2. The ideal healthcare system: guiding principles

Discussion of the guiding principles favoured by the hospital executive respondents is essential because they can offer valuable insights into strategies, challenges, and solutions for achieving equitable patient access. Discussion ensures that the theoretical constructs and actionable strategies have a real-world impact. Similarly, the Delphi panel of telehealth professionals hold opinions grounded in day-to-day realities.

Table 7.1 presents the consolidated responses from the hospital executive interviews and the Delphi expert panel survey of telehealth professionals.

**Table 7.1. Ideal healthcare principles (Delphi surveys vs interviews)**

| ***RANKING:*** <br> ***1 = MOST important; 4 = LEAST important*** | ***Main Delphi %*** | ***Main Delphi Ranking*** | ***Interview %*** | ***Interview Ranking*** |
|---|---|---|---|---|
| **The ideal healthcare system for New Zealand is founded on:** | | | | |
| The principle of **'equitable access.'** | 28.3 | ***1*** | 32.9 | ***1*** |
| The principle of **'patient-centred care.'** | 21.7 | ***4*** | 30.6 | ***2*** |
| The principle of **'integration.'** | 23.9 | ***3*** | 24.1 | ***3*** |
| The principle of **'shared resources.'** | 26.1 | ***2*** | 12.4 | ***4*** |

Source: The Author

The respondents agree that *equitable access* is the top-ranked principle for their ideal New Zealand health system (28.3% of Delphi responses and 32.9% of interview responses). This finding is notable, given how equitable access is the only outcome variable of those listed; the remainder are input processes that might lead to achieving this desirable outcome. Thus, it is reasonable to expect group disagreement regarding the 'best' way to achieve the desired result, Figure 7.1.

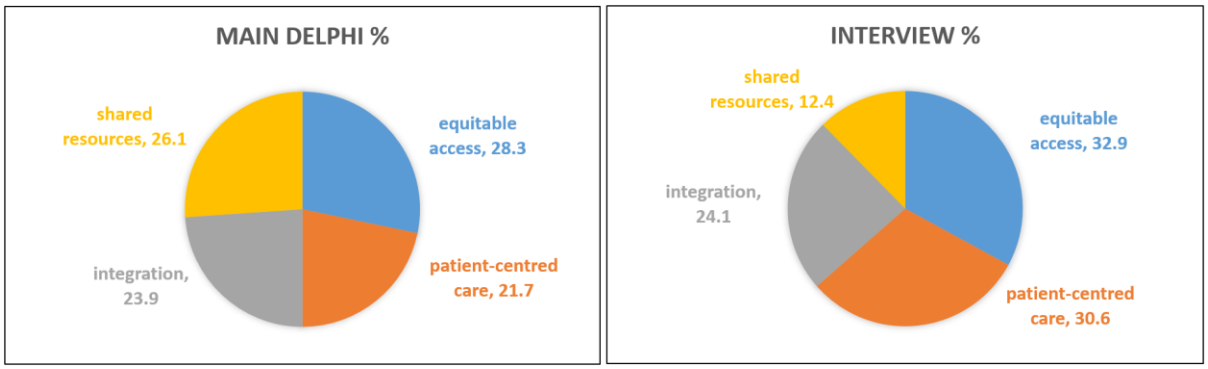



**Figure 7.1. Guiding principles comparison**

Source: The Author

For instance, the differing views on the importance of *patient-centred care* (ranked 4th by 21.7% of Delphi respondents and second by 30.6% of interview participants) might reflect the respective scope of responsibility represented within each group. Telehealth professionals, with their relatively limited focus, may emphasise specific aspects of *patient-centred* care within the context of telehealth services. In contrast, hospital executives responsible for the broader healthcare landscape may take a more holistic view that encompasses factors beyond individual patient interactions. This divergence of opinions underscores how role context can influence individual perspectives on healthcare principles. As seen here, the preference for *shared resources* is more pronounced among telehealth professionals than executives due to their vested interest in ensuring efficient resource allocation for the provision of telehealth services (ranked number 2 by 26.1% of Delphi respondents and number 4 by 26.1% of interview participants); reflecting how pragmatic considerations influence priorities and preferences.

Furthermore, the principle of *integration* possibly enjoys broad agreement because of its non-confrontational quality (ranked number 2 by both groups – 23.9% of telehealth respondents and 24.1% of interview participants). *Integration* implies harmonising diverse elements into a cohesive whole, which resonates with both groups. Adopting a non-adversarial approach makes it attractive, fostering consensus and cooperation among professionals with differing viewpoints and responsibilities.

## 7.3. Overarching principle and goals

The following section details the goals associated with the overarching principle of equitable access. The interviewees provide supporting empirical evidence.

### 7.3.1. Overarching principle: Equitable Access

***Overarching Goal:*** To guarantee that all individuals, regardless of socioeconomic status, geographic location, or other potential barriers, have equal access to high-quality healthcare services.

***Explanation:*** Equitable access constitutes a foundational principle within the framework of an ideal healthcare system. It aims to ensure that every individual, regardless of their background, is afforded equal opportunities to access healthcare services. This principle underscores the importance of addressing disparities that result in significant health inequalities and social injustices. Equitable access involves dismantling barriers such as financial limitations, geographic isolation, and discriminatory practices, promoting a more inclusive healthcare environment.

### 7.3.2. Goal 1: Universal coverage

**Objective:** The central aim of universal coverage is to guarantee that every individual within the healthcare system's jurisdiction has access to essential healthcare services, irrespective of socioeconomic status, geographical location, or pre-existing conditions.

**Description:** Universal coverage focuses on eliminating barriers to healthcare access, ensuring that services are available and affordable to all individuals, whether in urban or rural areas or economically advantaged or disadvantaged. This goal seeks to prevent the exclusion of individuals from necessary medical care due to financial constraints, location, or existing health conditions. It reinforces that health is a fundamental human right rather than a privilege.

| Interviewee | Direct Quote |
|---|---|
| **002** | "Access to care with less focus on prevention/wellness and more dollars spent on the high-end stuff in Hospital and Specialist Services (HSS). Access to GP services is often severely limited due to practices being closed to new enrolments. There is also little investment in technology platforms to access healthcare that connects providers and consumers on the platform." |
| **003** | "It has to be more around the models of care and how I can access and tap into the service, focused on the population as people at the centre and not the structure of the health system." |
| **013** | "Most people who come into the hospital now have a whole raft of medical and social challenges. The almost superior attitude of 'come to us' obviously does not work well unless you are a major city facility with good access." |
| **015** | "A barrier to access in primary care is financial." |
| **020** | "I consider equity as a base foundation requirement of good healthcare rather than a nice to have or something we consider it is the foundation n we should build healthcare on is equitable care and equitable access, and I do not think our system treats it as a minimum standard it treats it as a standard to aim for." |
| **040** | "The big thing I appreciate from the 'universal' New Zealand system is that it is all-encompassing. By that, I mean benefits regarding access and what people can get at a basic level. I think New Zealand does not provide access as much as other countries. I am also not sure those at the top fully understood the consequences regarding access to different treatments or what processes you must go through as a clinician to treat patients." |

### 7.3.3. Goal 2: Elimination of disparities

**Objective:** Eliminating disparities in healthcare access, outcomes, and quality, particularly those affecting marginalised and vulnerable populations, ensures that everyone, regardless of their background, receives the same level of care and has an equal chance at good health.

**Description:** Health disparities are unjust differences in health outcomes experienced by different groups. These disparities often stem from race, ethnicity, socioeconomic status, and geographic location. Eliminating these disparities is a matter of fairness and is crucial for a society's health and well-being. It requires targeted interventions, policies, and research to identify and address the root causes of these disparities, ultimately achieving equitable health outcomes for all.

| Interviewee | Direct Quote |
|---|---|
| **002** | "It would provide better outcomes for patients." |
| **003** | "If we had the primary care model working as intended, there would be improved health outcomes, wellness maintenance, early detection, and family approaches." |
| **010** | "Better engagement for those not engaging. Based on clinical outcomes and from consumers re: meeting their needs." |
| **011** | "Unless changing the way of working, having a supply that exceeds demand will not meet the desired outcomes. Equitable access is the glue. Access to those in rural populations and realising that we are unable to redeploy doctors to rural areas is where digital enablers come into play." |
| **022** | "We can talk about localities, but that is not changing the concept and the value system amongst primary care and that private ownership model, so we are going to have to do something in that particular area, and there is no doubt there is huge pressure on primary care and the outcomes of that huge pressure on primary care is inundated hospital systems." |
| **030** | "Alleviate blockages around capacity, resources, networks with primary care and data sharing between primary and secondary care. Just being open to more working together toward the common goal will lead to better outcomes for our community." |
| **040** | "It is an interesting demographic, and I have seen a lack of accountability within New Zealand that I have not seen elsewhere in my career. Clinicians are not held accountable for the outcomes, and I see how we try to think of the right adjectives when we get adverse outcomes. Moreover, because of the nature of the population, it is depressing to have to triage patients for observation. I also know that co-payment is an issue. The problem lies with the community's socio-demographic and economic factors, and how they will address them." |

### 7.3.4. Goal 3: Financial protection

**Objective:** Financial protection in healthcare aims to shield individuals and families from catastrophic healthcare expenses that can lead to financial ruin. It involves implementing insurance mechanisms and safety nets to ensure that healthcare costs do not become barriers to accessing necessary care.

**Description:** Healthcare costs can significantly burden individuals and families, especially when facing severe illnesses or emergencies. Economic protection mechanisms, such as health insurance, ensure that individuals do not have to choose between health and financial stability. By providing a safety net, this goal prevents individuals from going bankrupt due to medical bills, promotes peace of mind, and allows people to seek care when needed without fear of financial devastation.

| Interviewee | Direct Quote |
|---|---|
| **002** | "There are limitations around financial constraints where the more expensive treatments are available privately to those who can afford them. It may not be very efficient with limited resources; it may mean a lower level of care is provided." |
| **004** | "The short-term funding streams are barriers." |
| **013** | "Hopefully, we are moving away from value for money being the measure of overriding success. Building on the DHB model, working closely with primary care." |
| **015** | "A barrier to access in primary care is financial." |
| **040** | "Because I can't earn an income, we can't get decent housing, which creates our main health problems. I think I can't afford to go to the GP, so I clog up the emergency department instead." |

### 7.3.5. Goal 4: Timely and geographically accessible care

**Objective:** Timely and geographically accessible care ensures that healthcare services are readily available and easily accessible to individuals, reducing wait times and travel burdens.

**Description:** Timeliness is a critical aspect of healthcare access. Delays in accessing care can lead to worsened health outcomes. Whether someone lives in an urban centre or a remote rural area, they should be able to access healthcare services without excessive travel or long waiting periods. Achieving this goal requires a well-distributed healthcare infrastructure and efficient scheduling to minimise delays and make healthcare services convenient.

| Interviewee | Direct Quote |
|---|---|
| **001** | "Acceptance of poor performance due to fear of losing clinicians rather than a centre of excellence to attract clinicians. Expect a rural provider to struggle to attract high-quality clinicians." |
| **005** | "Care would be delivered at the most relevant place possible to the patient and not dependent on geographical boundaries. The link up with other providers would happen, particularly in primary care and diagnostic groups, which are private providers who are well funded." |
| **011** | "Equitable access in the glue. Access to those in rural populations, realising that we are unable to redeploy doctors to rural areas, is where digital enablers come into play." |
| **013** | "I think it is the same for healthcare transformation; there are certain things that you can do absolutely, but there are other things dependent on the local landscape, relationships, nuances, need, geography, and what facilities you put where needs to be worked out locally." |
| **014** | "The way we deliver healthcare now, where we base our healthcare, creates barriers to rural/urban access, is a classic example. You must conclude that the physical location must be removed from the problem, but how do you deal with that?" |

| | |
|---|---|
| **022** | "I have terrible patient outcomes from rural communities where I have patients bounced, not for months but for years because the production line has requested for this, and the diagnostics will take four months to come to us, then we sit on it, and it goes back six months later; it is a disaster." |

### 7.3.6. Goal 5: Community engagement

**Objective:** Involve communities and patients in healthcare decision-making, empower them to participate in their care, and contribute to policy development.

**Description:** Healthcare decisions should not be made in isolation but should involve those directly affected by them—patients and their communities. Community engagement ensures that the needs and preferences of the people they serve inform healthcare policies and practices. It empowers individuals to participate actively in their healthcare journey and contributes to more patient-centred and effective healthcare systems.

| Interviewee | Direct Quote |
|---|---|
| **002** | "Quality systems and clear metrics to measure outputs/communication of patient journey is good. Standardised metrics around sustainability, cost-effective, equitable access to care and meeting community needs." |
| **021** | "I think it is about access, a return to being patient-centred, and understanding what communities need. So, I think if we can listen and work out why things are not working, patients are not getting the access, and then build our services back around that, you will return to making sure people get the care when they need it and receive that equitable access irrespective of who you are in the community." |
| **022** | "The ideal system would be one where you could engage with our communities to achieve healthcare to achieve Equitable Access and Patient-Centred Care. There is an element of our population where access is made difficult. They are particularly rural out there and don't know what's available. Technology is vital, as is access to computers and the Internet." |
| **006** | "Have mobile services that reach the community with care provided closer to home. Key resources not being utilised by wealthier communities should be redirected to less affluent communities to help address inequities and access to care." |
| **021** | "We need to be able to provide for local communities. Local communities require absolute trust in what is delivered locally." |
| **040** | "It is imperative not to lose touch with the people on the ground providing services to those communities because if it does, it will fail." |

### 7.3.7. Goal 6: Health literacy

**Objective:** Promote health literacy among the population, enabling individuals to make informed health decisions and navigate the healthcare system effectively.

**Description:** Health literacy is the ability to understand and use health information to make informed decisions about one's health. It is a fundamental skill for individuals to advocate for their health, understand treatment options, and effectively communicate with healthcare providers. This goal recognises that an informed patient is empowered and capable of making choices that positively impact their health.

| Interviewee | Direct Quote |
|---|---|
| **003** | "Literacy, self-determination, patient-centred and health literacy, which is far away." |
| **005** | "Much more health literacy and health education are required, especially health education and literacy in schools." |
| **006** | "Owning your health and wellbeing and self-responsibility. Is well-being and health literacy targeted in schools? Consumer-owned and led." |
| **010** | "Generally, poor health literacy is present in two ways. It can present as an over-demand at the front door for services that are not even needed. That level of healthcare puts a lot of stress on the system. Conversely, Māori, South Asia, Indo-Asia, and Pacific populations perhaps do not sing out when they should." |
| **011** | "Regarding health literacy, which the service needs to bring in, we still have to be the provider of science-based evidence and advice, but we need to be more responsive. There is a risk that with increased health literacy, the demand will never end. For example, we should target health literacy to the Māori population and not just provide for 25% of the population. Better engagement for those not engaging. Based on clinical outcomes and meeting consumers' needs. Not measuring or setting outcomes. On a PF basis and a decrease in Māori obesity by 25%." |
| **012** | "It depends on how our patients wish to interact with us. Health literacy can be very poor and does not address inequity. Being able to achieve equitable models—I'm not sure. We can't force people to engage with us. Healthcare is a partnership between patient and clinician." |
| **030** | "You would be able to have individuals able to own and take responsibility for their health care needs. The only thing I worry about is that I don't know if it's very equitable. For someone with reasonably good health literacy, that would be ideal." |
| **014** | "Somewhere along the line, consumers must make decisions, engage, and participate. Things like health literacy, what is and is not funded, and the ability to navigate the system." |

### 7.3.8. Goal 7: Measurement and accountability

**Objective:** Establish robust data collection and reporting systems to monitor progress toward health equity and hold healthcare institutions accountable for achieving equitable outcomes.

**Description:** Measuring progress and holding healthcare institutions responsible for their actions and outcomes is essential to achieving health equity. Robust data collection allows for the identification of disparities and the evaluation of policies and interventions. This goal emphasises transparency and accountability in healthcare, ensuring that actions address disparities whenever and wherever they arise.

| Interviewee | Direct Quote |
|---|---|
| **001** | "We measure and report, but corrective actions are slow if they happen at all. You can throw money at the health sector. However, you will not achieve what you need to if you do not change the organisational culture and focus of those involved in health provision and patient care and their willingness to address poor performance. Culture and attitude are difficult to change. |
| **002** | "Quality systems and clear metrics to measure outputs/communication of the patient journey would be good. Standardised metrics around sustainability, cost-effective, equitable access to care and meeting community needs." |
| **010** | "We are not setting outcomes and measuring them. If we measured the system on a platform basis to say these are the outcomes, we know we want, could you affect named outcomes?" |
| **011** | "We need to ensure the correct checks and balances are in place to improve quality. A platform that monitors/measures demand and diverts it elsewhere. Sharing of patient information might be mitigated with a platform." |
| **013** | "When you look at what we are measured, monitored, and then paid for, it is the volume (the number of things we can do) and time (in terms of how quickly we can do them). Hopefully, the new system will allow for some sensible, evidence-based local determination about where you best invest, and we use that as the measure of success rather than national metrics that may or may not be the best focus of resource." |
| **014** | "We need to understand the metrics that show success and those that do not. The risk with our present system is that we don't necessarily have a good set of metrics, and we often use proxy metrics, but they are not always true measures. So, the moment we have a metric that shows some adverse results, we risk misinterpreting our progress unless they are the true performance metric. So, having some good metrics that are comprehensive, and reasonably objective is a true measure of progress or success." |

These seven goals provide a comprehensive framework for advancing equitable access to healthcare and represent a holistic approach to addressing the multifaceted barriers to healthcare access, encompassing financial, geographic, cultural, and systemic dimensions. Attaining these objectives is a moral imperative and essential for developing a healthcare system that effectively meets the diverse needs of individuals and communities, thereby promoting health and well-being for all.

The strategic vision encapsulated in these seven goals provides a robust foundation for examining healthcare dynamics within the National/Organisation/Management (NOM) decision framework. The framework facilitates a seamless transition from macro-level imperatives of equitable healthcare access to the micro-level complexities of decision-making processes. The holistic approach discussed aligns with the NOM framework's considerations of factors such as *Systems Integration, Technology Acceptance, Strategic Intent, Change Readiness, Governance, and Available Funding*. The approach also highlights the practical application of overarching goals, illustrating how a comprehensive healthcare system depends on the intricate interplay of these diverse factors.

The theoretical frameworks employed in this research further enhance the analytical narrative, providing a structured lens to interpret the complex interactions within the healthcare ecosystem. By bridging macro-level aspirations with micro-level decision dynamics, these frameworks offer a nuanced understanding of the transformative potential inherent in healthcare systems. This unified trajectory of thought not only elucidates the interconnected nature of the goals and decision-making processes but also contributes valuable insights for future research and development in healthcare transformation.

## 7.4. Healthcare system dynamics

Systems thinking contributes to understanding the critical management issues for service systems facing complex conditions (Badinelli et al., 2012). Figure 7.2 shows how the NOM decision framework factors arising from Round 3 of the Delphi study are interconnected and influence one another, thereby shaping the behaviour of the ideal healthcare system as a viable service system (Badinelli).

The theoretical frameworks selected for this research help explain the dynamics observed across multiple levels of the health ecosystem. These structural relationships underscore a layered system model, where National, Organisational, and Management factors interact in nonlinear and evolving ways. The interactions inform the immediate transformation journey and affect long-term system sustainability and resilience.

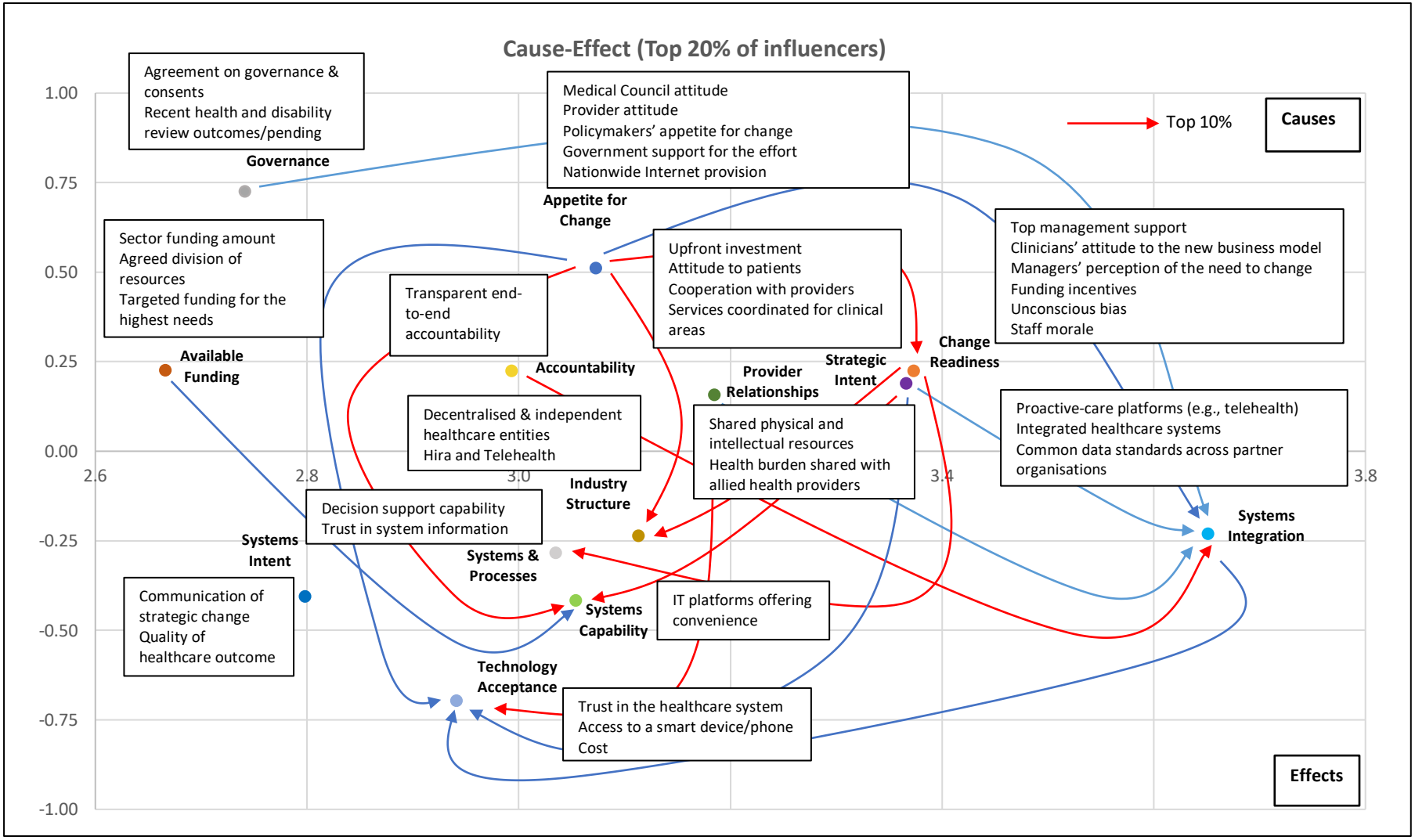



**Figure 7.2. Relational diagram for the ideal healthcare system**

Source: The Author

Through causal mapping, each factor was empirically classified based on the direction of influence:

1. **Systems Integration (Effect Factor)**
   - This factor reflects the adoption of proactive, integrated care platforms and common data standards across partner organisations within the healthcare system.
   - Causal analysis indicates that *Systems Integration* is an outcome shaped by upstream factors, including governance structures, strategic leadership commitment, and the strength of inter-provider relationships. Thus, *Governance, Appetite for Change, Strategic Intent, Provider Relationships* and *Accountability* influence *Systems Integration*.
   - **Health Policy and Governance Theory** (HPGT) can help explain how these structural enablers and institutional mandates influence integration efforts. Similarly, **Organisational Change Management Theory** (OCMT) helps explain how senior stakeholders' intention to pursue *Systems Integration* influences managers' attitudes and perceptions (*Appetite for Change*). Sections 3.4.1 and 3.4.2 contain detailed explanations of OCMT and HPGT, respectively.
2. **Change Readiness (Causal Factor)**
   - Considerations like senior management support, clinician attitudes, funding incentives, and staff morale shape this factor, representing healthcare managers' preparedness to embrace change.
   - Thus, *Change Readiness* influences *Industry Structure, Systems & Processes*, and *Systems Capability.* Empirically, it functions as a mobilising mechanism that drives internal reconfiguration and cross-organisational alignment.
   - **Organisational Change Management Theory** can help explain how senior stakeholders' *strategic intent* impacts the readiness of managers and the broader organisation to change.
3. **Governance (Causal Factor)**
   - At the national level, *Governance* involves agreements, legislation, leadership quality, and communication standards.
   - *Governance* operates at a foundational layer to influence *Systems Integration,* fostering alignment and consistency across the ecosystem.
   - Theoretical frameworks related to **Health Policy and Governance** can help explain how the structure and policies around data standards and integrated care platforms impact national-level governance decisions.
4. **Technology Acceptance (Effect Factor)**
   - This factor focuses on patient acceptance of technology, including trust in the healthcare system, accessibility via smart devices, and cost considerations.

- Contrary to linear assumptions, technology acceptance is not driven purely by user preference but influenced by provider behaviours and healthcare organisations' strategic postures. *Strategic Intent, Provider Relationships,* and *Appetite for Change* all influence *Technology Acceptance.*
- Frameworks such as the **Technology Acceptance Model (TAM)** can help explain how patient attitudes to technology influence resource allocation. Section 3.4.3 contains a detailed explanation.

5. **Available Funding (Causal Factor)**
   - This factor involves high-level decisions on sector funding, resource allocation, and funding targeted at high-need areas.
   - *Available Funding* influences *Systems Capability* and does not merely support existing infrastructure but actively enables the emergence of new system capabilities.
   - **Resource Dependency Theory** (RDP) explains how financial control shapes organisational autonomy, influences collaboration, and drives strategic choices. Section 3.4.4 contains a detailed explanation.
6. **Strategic Intent (Causal Factor)**
   - This factor reflects the commitment of senior stakeholders in provider organisations to upfront investments and their attitudes towards patients, coordinated services and cooperation with other providers.
   - *Strategic Intent* influences *Systems Integration, Systems Capability,* and *Technology Acceptance* and plays a pivotal role in setting the tone for transformation, cascading through multiple system layers.

Theoretical frameworks like **Strategic Management Theory** can help interpret how the deliberate articulation of vision and values drives structural and behavioural shifts. Section 3.4.4 contains a detailed explanation.

These dynamics highlight the intricate relationships among factors that ultimately determine the success of healthcare system transformation. Theoretical frameworks from Organisational Change Management, Change Management, Health Policy and Governance, Technology Acceptance Models, and Strategic Management can help provide a structured understanding of these relationships.

By applying them, researchers and policymakers can gain insights into how changes at one healthcare system level, whether related to technology adoption, strategic intent, or integration efforts, ripple through the system, influencing readiness, governance decisions, and funding allocation. This understanding is critical for creating effective strategies and policies that drive the healthcare system toward the ideal model of equitable access and quality care for all.

# Chapter 8: Gaps Between the Present Healthcare System and the Ideal

## 8.1. Introduction

The contrast between the current health outcomes and those desired by the espoused ideal healthcare system looms large in the ongoing pursuit of excellence in healthcare. As a precursor to constructing a nuanced understanding of the 'ideal' healthcare system for New Zealand, this chapter uses theory to examine the size and scope of the disparities between the prevailing reality of health outcomes and the lofty ideal.

The healthcare sector stands at a critical juncture, marked by substantial gaps between its present capacity/capability and the espoused ideal of what a new, ideal healthcare model should provide. The disparities present a multifaceted challenge encompassing various healthcare delivery dimensions, underscoring the urgent need for transformative change to bridge the divide.

## 8.2. Examining the gaps

### 8.2.1. Equitable access to healthcare

The present healthcare system, riddled with disparities in accessibility, is fundamentally misaligned with the espoused ideal of universal and equitable access to care (Smith & Brown, 2021). It is imperative to recognise that healthcare is not merely a service but a fundamental human right and a cornerstone of societal well-being. However, the stark reality is that not everyone has equal access to healthcare services.

**1. Socioeconomic Disparities**

One of the most glaring aspects of this accessibility gap is the existence of deep-rooted socioeconomic disparities (Harris & McDonald, 2019). Income and wealth play a pivotal role in determining an individual's access to healthcare. Those with higher incomes often have greater access to comprehensive health insurance, which translates into better access to care, preventive services, and timely interventions.

**2. Geographic Barriers**

Geography should never be a barrier to healthcare, but in the present state, it often is (Smith & Brown, 2021). Rural and remote communities face significant challenges to healthcare access regarding facilities, specialists, and primary care (Ministry of Health, 2021). The geographic maldistribution of healthcare resources perpetuates these barriers, leaving rural populations disadvantaged (Health Quality and Safety Commission, 2021).

### 3. Systemic Inequalities

Systemic inequalities, including racial and ethnic disparities in healthcare, persist as a profoundly concerning aspect of the accessibility gap. Research consistently highlights that minority communities face barriers to access, quality of care, and health outcomes (Riley & Teo, 2020). Complex factors drive these disparities, including implicit bias, discriminatory practices, and socioeconomic disadvantages (Signal et al., 2007).

The espoused ideal healthcare model unequivocally demands that everyone have unhindered access to high-quality care regardless of income, geographic location, race, or other demographic attributes. As embraced by many advanced nations, universal healthcare coverage exemplifies this ideal. It embodies the principle that access to healthcare should be a right, not a privilege. Bridging this accessibility gap necessitates policy reforms that address socioeconomic disparities, ensure equitable distribution of healthcare resources, and actively combat systemic inequalities.

## 8.2.2. Patient-centred care

Another critical dimension of the healthcare divide is the chasm between the present healthcare system's approach and the espoused ideal of patient-centred care. Patient-centred care goes beyond treating diseases; it centres on placing the patient at the core of care delivery, understanding their unique needs and preferences, and tailoring care plans accordingly.

- **Fragmented Care Experiences**

  Many patients report fragmented care experiences (Gauld, 2017). The healthcare system is often organised around providers and specialties, resulting in disjointed care pathways. This fragmentation can lead to poor coordination, communication gaps, and patient dissatisfaction (Cumming et al., 2014).

- **Limited Shared Decision Making**

  A fundamental aspect of patient-centred care is shared decision-making. Patients should be actively involved in personal healthcare decisions based on their values and preferences. However, empirical evidence suggests that many patients perceive a lack of shared decision-making in their interactions with healthcare providers (Stubbe et al., 2017). This lack of communication is a crucial gap to address, as involving patients in decisions related to their care enhances their autonomy and leads to better adherence to treatment plans and improved health outcomes.

- **Continuity of Care**

Another facet of patient-centred care is the continuity of care. Ideally, patients should experience a seamless continuum of care as they navigate the healthcare system. However, patients often encounter episodic care, with frequent transitions between providers and settings. These transitions can disrupt care, lead to redundant tests, and jeopardise patient safety (McKinlay et al., 2021).

### 8.2.3. Integration of healthcare services

Integration of healthcare services is a significant gap between the present healthcare system and the espoused ideal. The ideal model emphasises the seamless coordination and integration of care across various settings and providers to ensure that patients receive comprehensive and well-coordinated care.

- **Fragmentation and Silos**

Fragmentation in healthcare delivery is a prevailing issue (Gauld, 2014). Many patients, especially those with chronic conditions, experience care that is fragmented and siloed. It can occur when providers and specialties operate independently without effective communication and coordination. As a result, patients often find themselves navigating a complex web of disconnected services (Cumming et al., 2014).

- **Information Sharing Challenges**

Effective care integration relies on the timely and accurate exchange of patient information among healthcare providers. However, interoperability issues, incompatible electronic health records (EHRs), and data silos hinder the seamless sharing of patient data. This lack of data exchange can lead to redundant tests, medication errors, and delays in care (Davis et al., 2014).

- **Care Transitions**

Smooth transitions of care are pivotal for patient safety and quality of care. However, care transitions are often challenging, particularly during shifts from hospitals to post-acute care or primary care settings. Poorly managed transitions can result in medication errors, readmissions, and adverse events (Health Quality & Safety Commission, 2019; Kringos et al., 2020).

The espoused ideal healthcare model envisions a system where care is integrated seamlessly across the care continuum, regardless of the care setting or provider. This integrated approach ensures that patients receive cohesive and well-coordinated care experiences, which is particularly important for those with chronic conditions who require ongoing management. The espoused ideal requires investment in data and digital technology, standardisation of care protocols, and fostering a culture of collaboration by healthcare providers.

### 8.2.4. Resource allocation and optimisation

Efficient resource allocation is a crucial aspect of the ideal healthcare model. It emphasises the need to allocate resources efficiently, ensuring that healthcare services are delivered where they are most needed when needed, and optimising outcomes.

- **Fee-for-Service Model Challenges**

The fee-for-service payment model, prevalent in many healthcare systems, has been scrutinised for its influence on resource allocation. Because it incentivises the volume of services provided rather than the value or outcomes of care, it can lead to overutilisation of services, unnecessary procedures, and escalating healthcare costs (Dew & Matheson, 2017).

- **Regional Disparities**

Disparities in resource allocation exist not only at the individual level but also at the regional level. Specific areas or healthcare facilities can receive more resources and investment than others, contributing to variations in care quality and access based on geographic location (Crampton & O'Dowd, 2016).

- **Suboptimal Resource Utilisation**

Suboptimal resource utilisation is a challenge in healthcare. Resources, including medical equipment, personnel, and hospital beds, may not always be allocated efficiently. This inefficiency can result in resource shortages in critical areas and oversaturation in others (Nugent & Bloor, 2018**)**.

The ideal healthcare model calls for resource allocation strategies prioritising value, equity, and efficiency. These may include transitioning from fee-for-service models, adopting value-based payment structures, and implementing evidence-based guidelines to optimise resource allocation. Additionally,

addressing regional disparities and ensuring a fair distribution of healthcare resources is essential to achieve the ideal of efficient resource allocation.

## 8.3. Bridging the gaps with theory

Bridging the gap between current health outcomes and the ideal healthcare model is a multifaceted challenge that requires a comprehensive understanding of the disparities in healthcare accessibility, patient-centredness, integration, and resource allocation. Recognising these gaps and considering relevant theoretical frameworks provide the foundation for developing strategies and interventions to transform healthcare delivery.

### 8.3.1. Gap 1: Equitable access to healthcare

Perhaps the most profound difference between New Zealand's present system and the espoused ideal is inequitable access to healthcare services. The ideal healthcare model envisions a system where everyone has unhindered access to high-quality care regardless of socioeconomic status, geographic location, or demographic attributes. However, the current reality is that disparities in access to healthcare services persist, driven by social determinants of health such as income, education, race, and geography. These determinants create barriers that impede individuals' ability to seek and receive timely, appropriate care.

Empirical studies reveal similar stark disparities in healthcare access. For instance, research consistently demonstrates that individuals from marginalised communities, particularly racial and ethnic minorities, experience higher rates of delayed or forgone medical care due to barriers like cost and lack of insurance coverage (Artiga et al., 2020). Moreover, rural populations face considerable challenges in accessing healthcare services due to geographical barriers and shortages of healthcare providers (Hart & Freeman, 2005). These disparities are further exacerbated by the maldistribution of healthcare resources, with urban areas often having more healthcare facilities and specialists than rural areas (Hart).

### 8.3.2. Theoretical framework: Social Determinants of Health Model (SDOH)

The Social Determinants of Health model refers to the conditions and circumstances in which individuals are born, grow, live, work, and age and how these conditions impact their health, functioning, and quality of life. SDOH encompasses many factors, from economic inequality and education to housing, social support, and access to healthcare services. The World Health Organization (2024) defines SDOH as 'the structural determinants and conditions in which people are born, grow, live, work, and age.'

The model underscores the critical role of social, economic, environmental, and cultural factors in shaping health outcomes. The conditions under which individuals live, work, age, and access healthcare services influence their health. Addressing the social determinants of health through policies and interventions can increase healthcare access equity, and theoretical frameworks such as the SDOH model provide a foundation for understanding how a complex interplay of socioeconomic factors influences healthcare access (Marmot, 2007).

*Fundamental principles of SDOH:*

- **Social Gradient:** The social gradient in health indicates that health outcomes follow a gradient pattern, with better health associated with higher social and economic status. Individuals in more privileged positions tend to have better access to resources and opportunities that promote health.
- **Life Course Perspective:** SDOH recognises that health changes throughout a person's life. Early life experiences, including prenatal conditions and childhood environments, can have a profound and lasting impact on health outcomes in adulthood.
- **Cumulative Effects:** The impact of SDOH is cumulative over time. Experiences of disadvantage or advantage accumulate throughout life and influence health outcomes. Persistent exposure to adverse conditions can result in poorer health outcomes.
- **Interconnectedness:** SDOH factors are interconnected and interdependent. Influences like income, education, housing, and employment are interrelated, and changes in one domain can have ripple effects on others.

The SDOH domains affecting health outcomes comprise:

- **Economic Stability:** Economic factors such as income, employment, and socioeconomic status significantly affect health outcomes. Individuals with higher income levels generally have better access to healthcare, nutrition, and safer living conditions.
- **Education:** Education is a crucial determinant of health. Higher levels of education are associated with better health, as educated individuals tend to make healthier choices and have more opportunities for employment and income.
- **Social and Community Context:** Social factors, including social support, community cohesion, and neighbourhood safety, play a vital role in health. Strong social networks and community support can mitigate the impact of other adverse SDOH.

- **Health Access and Quality:** Access to healthcare services, including affordability, availability, and quality, is a crucial SDOH issue. Disparities in healthcare access can result in unequal health outcomes.
- **Neighbourhood and Built Environment:** The physical environment, including housing conditions, transportation, and access to green spaces, can influence health. Safe and walkable neighbourhoods promote physical activity and well-being.
- **Cultural Factors:** Cultural factors, including language, traditions, and cultural beliefs, can influence health behaviours and healthcare utilisation. Healthcare systems must be culturally sensitive and responsive to diverse populations.

*Implications of the SODH health model*

Adopting the SODH health model principles can help bridge gaps in patient-centred care.

- **Health Inequities:** SDOHs are a primary driver of health inequities. Inequities refer to avoidable and unjust differences in health outcomes between different groups, often stemming from social disadvantage.
- **Policy Interventions:** Recognising SDOH's impact has led to developing policies and interventions to address health disparities. These policies may include reducing income inequality, improving education, and providing affordable housing.
- **Healthcare Delivery:** Healthcare providers are increasingly integrating SDOH into clinical practice. They consider patients' social circumstances when developing care plans and referrals to address non-medical needs.
- **Research and Data:** SDOH research has become a central focus in public health research, helping to inform evidence-based interventions and health policies.
- **Global Health:** SDOHs are relevant at the local level and worldwide. They contribute to health disparities between countries and influence global health outcomes.

Recognising SDOH's significance has profound implications for public health, healthcare delivery, policy development, and research. Addressing health inequities and promoting health equity requires a multifaceted approach encompassing medical care and broader social and economic determinants.

### 8.3.3. Gap 2: Patient-centred care

The second chasm to bridge revolves around patient-centred care. The ideal healthcare model champions care that is not merely focused on treating diseases but places the patient at the epicentre of care delivery, incorporating their preferences, values, and needs. Healthcare systems often struggle to fully embrace patient-centred care, resulting in fragmented, provider-centric approaches that do not adequately address patients' holistic needs.

Numerous studies highlight the deficiencies in patient-centred care. One key aspect is patients' limited involvement in decision-making about their care. Research indicates that patients frequently perceive a lack of shared decision-making in their interactions with healthcare providers (Frosch et al., 2001). Additionally, continuity of care, an essential element of patient-centred care, often falls short of the ideal. Many patients experience episodic care, with frequent provider transitions leading to disjointed care experiences (Haggerty et al., 2003).

### 8.3.4. Theoretical framework: Patient-centred Care Model

Patient-centred care is a foundational approach in contemporary healthcare that prioritises patients' needs, preferences, and values. This framework emphasises active patient involvement in decision-making, respect for patient preferences, and continuity of care (Epstein & Street, 2011). Implementing patient-centred care practices and training healthcare providers in these principles can enhance the patient experience.

#### *Fundamental principles of the patient-centred care model*

- **Respect for Patients' Values and Preferences:** In the patient-centred care model, healthcare providers respect and honour patients' cultural, social, and personal values and preferences for care. This principle promotes patient autonomy and dignity.
- **Coordination and Integration of Care:** Patient-centred care emphasises the coordination and integration of healthcare services. It ensures that patients receive seamless care across various healthcare settings and disciplines.
- **Information and Communication:** Effective communication is vital in patient-centred care. Healthcare providers should provide clear and understandable information to patients, engage in active listening, and involve patients in decision-making.

- **Physical Comfort and Emotional Support:** The model recognises that patients' physical comfort and emotional well-being are interconnected. It emphasises the importance of creating a caring and empathetic environment to address these needs.
- **Involvement of Family and Friends:** Patient-centred care involves patients' families and support networks as active partners in care. It acknowledges the valuable role that loved ones play in the healing process.
- **Access to Care and Support:** Patients should have timely access to care and support services appropriate to their needs. This principle promotes equitable access and reduces disparities in healthcare.

*Components of the Patient-centred Care Model*

- **Patient Engagement:** Patient engagement is at the heart of patient-centred care. It involves involving patients in care decisions, treatment planning, and goal setting. Engaged patients are likelier to follow their care plans and achieve better health outcomes.
- **Shared Decision-Making:** Shared decision-making is a collaborative process in which healthcare providers and patients collaborate to make informed treatment decisions. It recognises patients as experts in their own experiences and values.
- **Patient Education:** Patient-centred care includes comprehensive education to ensure patients understand their condition, treatment options, and self-management strategies.
- **Holistic Assessment:** Healthcare providers conduct holistic assessments considering the patient's physical symptoms and emotional, social, and spiritual well-being. This approach helps identify and address all aspects of a patient's health.

Primary care settings widely implement the principles of the Patient-Centred Care Model. They help build solid patient-provider relationships and support continuity of care, which is crucial for managing chronic conditions.

- **Cancer Care:** Patient-centred approaches are essential to address patients' and their families' complex physical and emotional needs. They also ensure that treatment decisions align with patients' values and preferences.
- **Paediatric Care:** Paediatric providers use patient-centred care to involve parents and children in decision-making and provide age-appropriate education and support.
- **Mental Health Services:** Patient-centred care is crucial in mental health services, as it involves understanding and addressing the unique needs and perspectives of individuals with mental health conditions.

- **Chronic Disease Management:** Effectively managing chronic diseases requires patient-centred care to support patients in self-management, medication adherence, and lifestyle changes.
- **End-of-Life Care:** Patient-centred care ensures that the patient's wishes and goals for their final days are respected and fulfilled.

The Patient-centred Care model represents a paradigm shift in healthcare, placing patients at the forefront of their care experiences. Healthcare providers can deliver more effective, compassionate care that aligns with patients' values and preferences by tightly adhering to the principles of respect, coordination, communication, and patient engagement. As healthcare evolves, patient-centred care remains essential for improving outcomes, enhancing patient satisfaction, and promoting a more holistic approach to health and well-being.

### 8.3.5. Gap 3: Care integration

The third disparity pertains to the integration of healthcare services. The ideal healthcare model envisions a system where care is coordinated seamlessly across various settings and providers, ensuring that patients receive comprehensive and well-coordinated care, particularly those with chronic conditions. However, the reality is fragmented, with siloed care delivery and inadequate coordination among healthcare providers, leading to inefficiencies, medical errors, and suboptimal health outcomes.

The empirical evidence underscores the fragmented nature of healthcare delivery. Studies reveal that patients with chronic conditions often receive care from multiple specialists, leading to poorly coordinated care and a lack of a unified approach (Parekh et al., 2022). The lack of interoperability and information sharing among healthcare systems and providers further hampers care coordination. Electronic health records are often not interoperable, hindering the seamless exchange of patient information (Adler-Milstein & Jha, 2017).

### 8.3.6. Theoretical framework: Chronic Care Model

Developed by a team of researchers in the 1990s, the Chronic Care Model (CCM) addresses the unique challenges of chronic illnesses, which are long-term health conditions requiring ongoing management. The CCM also provides valuable insights to improve the integration of care. This framework emphasises care coordination, self-management support, and clinical information systems (Wagner et al., 1996). The CCM is a widely recognised and influential framework in the field of healthcare. Healthcare organisations can adopt elements of this model to enhance care integration for patients with chronic conditions.

The CCM comprises six essential components that work synergistically to improve the care and outcomes of patients with chronic conditions:

1. **Community Resources and Policies:** This component recognises that the support and resources available in the community play a crucial role in chronic care. It involves aligning policies and resources within the community to support patients' self-management and access to care.
2. **Health System Organisation:** Effective chronic care requires a well-organised healthcare system that efficiently identifies and manages patients with chronic conditions. It includes implementing patient registries, clinical information systems, and other tracking and monitoring tools.
3. **Self-Management Support:** Empowering patients to actively participate in managing their health is a central tenet of the CCM. Healthcare teams should provide patients with the knowledge, skills, and support they need to self-manage their chronic conditions effectively.
4. **Delivery System Design:** The organisation of chronic care delivery should meet the specific needs of patients with chronic conditions. This component encourages care teams to use evidence-based guidelines and protocols to ensure comprehensive and coordinated care.
5. **Decision Support:** Clinical decision support tools, such as guidelines and protocols, help healthcare providers make informed decisions about patient care. They ensure that care is evidence-based and consistent across the healthcare system.
6. **Clinical Information Systems:** Access to relevant patient data and health information is essential for effective chronic care. Clinical information systems enable healthcare teams to track patients, monitor progress, and make informed decisions.

### *Principles guiding the Chronic Care Model*

Several fundamental principles underpin the CCM, shaping its implementation and effectiveness:

- **Patient-Centred Care:** The CCM places patients at the centre of care, recognising their unique needs, preferences, and goals. It encourages shared decision-making and patient involvement in care planning.
- **Proactive and Preventive Care:** Rather than merely reacting to acute episodes, the CCM emphasises proactive and preventive care. It seeks to identify and address issues before they escalate into crises.
- **Evidence-Based Care:** The CCM relies on evidence-based guidelines and protocols to ensure that care is grounded in the best available scientific evidence and promotes consistent, high-quality care.
- **Care Coordination:** Effective care coordination is a cornerstone of the CCM, which involves ensuring all healthcare team members work together seamlessly to provide comprehensive and integrated care.

*Application of the Chronic Care Model*

The CCM has been widely adopted and applied in various healthcare settings and for different chronic conditions:

- **Primary Care:** Many primary care practices have integrated CCM principles into their care delivery. They use patient registries, care teams, and self-management support to improve care for patients with diabetes and hypertension.
- **Disease Management Programs:** Disease management programs for chronic conditions often draw from the CCM to provide structured, evidence-based patient care. These programs aim to prevent complications and reduce healthcare costs.
- **Home-Based Care:** The CCM is adaptable for home-based care models, where healthcare professionals visit patients in their homes to provide ongoing support and monitoring.
- **Telehealth:** Telehealth and telemedicine programs have incorporated CCM principles to deliver remote care and support to patients with chronic conditions, particularly in rural or underserved areas.
- **Policy Development:** Policymakers have used the CCM to design healthcare policies promoting chronic care management and prevention. These policies may include reimbursement incentives for healthcare providers who follow CCM principles.

The Chronic Care Model is a transformative framework that has reshaped healthcare delivery to individuals with chronic conditions. Its emphasis on patient-centred care, proactive management, evidence-based practices, and care coordination has improved outcomes and a higher quality of life for countless patients. As the prevalence of chronic illnesses continues to rise, the application of the CCM remains vital for healthcare systems seeking to address the unique challenges posed by these conditions and provide optimal care to those who need it.

### 8.3.7. Gap 4: Resource allocation and optimisation

The final gap pertains to resource allocation and optimisation. The ideal healthcare model advocates for the efficient allocation of resources to ensure healthcare services are delivered where they are most needed, when they are required, and in a manner that optimises outcomes.

In practice, resource allocation is often suboptimal, influenced by financial incentives, supply-driven care, and the absence of real-time adaptation to patient needs.

Empirical studies underscore the challenges in resource allocation. Fee-for-service payment models, for instance, have been associated with overutilisation of services and healthcare spending, often without corresponding improvements in patient outcomes (Kronick, 2017). Moreover, disparities in resource allocation persist, with certain regions or healthcare facilities receiving more resources and investment than others, which can lead to variations in care quality and access based on geographic location (Baicker et al., 2005).

Exploration of the essential dimensions of healthcare delivery with extant theory underscores the imperative for transformative change within the healthcare sector.

### 8.3.8. Theoretical framework: Resource Allocation Theory

Whether applied to business strategy, public policy, healthcare, or non-profit management, Resource Allocation Theory provides a structured framework for choosing how to distribute limited resources among competing needs and objectives. By considering principles like scarcity, opportunity cost, efficiency, equity, and trade-offs, organisations and individuals can make informed decisions that maximise the value and impact of the resources at their disposal. It seeks to address the fundamental challenge of distributing finite resources among competing demands. Critical considerations in resource allocation include efficiency, equity, and the trade-offs between different uses of resources.

The Resource Allocation Theory lens can guide resource distribution to maximise health outcomes based on need, efficiency, and effectiveness (Barnum et al., 1995). It provides a framework for understanding how organisations, individuals, and societies distribute and manage limited resources among competing needs and priorities.

*Fundamental principles of Resource Allocation Theory*

- **Scarcity:** At its core, Resource Allocation Theory recognises that resources are finite and insufficient to meet all needs and wants. Scarcity necessitates making choices about how to allocate resources effectively.
- **Opportunity Cost:** Every allocation decision involves an opportunity cost—what must be foregone to pursue a particular choice. Understanding opportunity costs is crucial for making informed resource allocation decisions.
- **Efficiency:** Resource allocation should maximise the utility or benefits derived from available resources, achieving efficiency when resources yield the highest overall satisfaction or value.

- **Equity:** Equity considerations are integral to resource allocation. Decisions should consider fairness, distributional justice, and the needs of vulnerable or disadvantaged populations.
- **Trade-offs:** Resource allocation often requires making trade-offs between conflicting objectives. For example, allocating more funds to education may reduce the budget available for healthcare.

*Resource allocation approaches*

- **Market Mechanisms:** Resource allocation often relies on supply and demand dynamics in free-market economies. Prices, determined by market forces, guide the allocation of goods and services. Market mechanisms are efficient but may raise concerns about equity.
- **Budgeting and Prioritisation:** Budgeting processes within organisations and government agencies involve setting priorities and allocating resources. They often entail reviewing proposals, assessing their expected impact, and making decisions based on available funding.
- **Cost-Benefit Analysis (CBA):** CBA systematically evaluates projects or policies by comparing their expected costs and benefits. It helps identify projects that provide the most value for a given budget.
- **Cost-Effectiveness Analysis (CEA):** CEA evaluates alternative interventions by comparing their costs and outcomes, ideally reporting outcomes in standard units (e.g., cost per life saved).
- **Multi-Criteria Decision Analysis (MCDA):** MCDA allows decision-makers to consider multiple criteria, such as cost, quality, and environmental impact, in resource allocation. It provides a structured way to evaluate complex, multi-dimensional choices.

*Application of Resource Allocation Theory*

In a world characterised by resource constraints and competing demands, applying Resource Allocation Theory remains essential for achieving individual and societal goals. Whether used in business strategy, public policy, healthcare, or non-profit management, Resource Allocation Theory provides a structured framework for making choices about how to distribute limited resources among competing needs and objectives:

- **Business Strategy:** Resource Allocation Theory informs corporate strategy by guiding decisions about allocating financial, human, and technological resources among various business units or projects.
- **Healthcare:** Resource allocation is a critical consideration in healthcare. It helps healthcare systems decide how to distribute limited resources such as medical equipment, personnel, and funds among competing medical treatments and patient needs.

- **Public Policy:** Governments use Resource Allocation Theory to make decisions about public spending, taxation, and investment in infrastructure, education, and social welfare.
- **Non-profit Organisations:** Resource allocation is vital for non-profit organisations, which must effectively allocate limited donations and resources to their charitable missions.
- **Environmental Management:** Environmental agencies use resource allocation principles to decide how to allocate resources for conservation efforts, pollution control, and natural resource management.

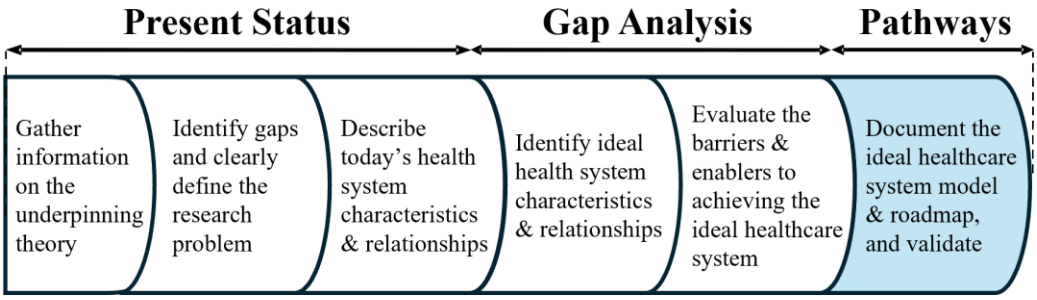
## 8.4. Conclusion

Existing theory reveals the scope and extent of the changes needed within New Zealand's healthcare sector to achieve the espoused ideal. The gaps between the health sector's present capacity and capability and the espoused ideal represent a complex, multifaceted challenge encompassing accessibility, patient-centredness, integration, and resource allocation. Recognising these disparities is the first step toward transformative change in healthcare. Achieving the ideal healthcare model—one that offers equitable access, prioritises patient needs, fosters integration, and optimises resource allocation—requires comprehensive policy reforms, cultural shifts within healthcare, and a commitment to values that prioritise the well-being of individuals and communities above all else.

Bridging the gaps is an ethical imperative and a path toward better health outcomes and a more resilient healthcare system. The next chapter explores how these concepts fit into a new 'symbiotic' healthcare model.

# Chapter 9: Symbiotic Healthcare

## 9.1. Introduction




According to Brady et al. (2020), research-oriented conceptual frameworks encapsulate what is possible to study and are intentionally comprehensive. In contrast, a research-oriented conceptual model is strictly a diagram showing the critical components of prevention and intervention programs, practices, and policies that promote health, encapsulating what the researcher has prioritised and chosen to study (Earp & Ennett, 1991).

Conceptual modelling involves developing a high-level system representation, including its objectives, inputs, outputs and simplifications (Robinson, 2008). Frequently depicted using graphical notations like causal loop diagrams or activity diagrams (Brailsford et al., 2019), conceptual models contrast with systems models, which consider connections among different components and plan for the implications of the interactions, requiring transdisciplinary thinking and active engagement of those who have a stake in the outcome to govern change (Leischow & Milstein, 2006).

This chapter describes the factors to include in the high-level conceptual model of the ideal healthcare system using the preceding theoretical bases, key stakeholder bases, and evidence-based rationales. It also utilises a systems model (causal loop diagram) to introduce an implementation strategy roadmap.

### 9.1.1. Steps in constructing a transformational healthcare concept

Contemporary conceptualisations of public health (e.g., Balazs & Ray, 2014; Warnecke et al., 2008) enhance traditional frameworks by more explicitly adopting life course perspectives and incorporating health equity, social justice, and community engagement principles to guide research, practice, and policy. These 'nested spheres' of influence interact to produce individual and population health (Brady et al., 2020). According to Brady, selecting factors for inclusion in the conceptual model also involves narrowing the

range of risk and protective factors to a workable number. In this research, the reason for building a conceptual model was to challenge researchers and practitioners to expand their conceptual repertoire and think beyond the usual cost-cutting measures and evolutionary attempts at improving the performance of New Zealand's public health sector. Hence, existing theories, key stakeholders, and the evidence base helped select the appropriate risk and protective factors.

## 9.2. Towards a symbiotic care model

### 9.2.1. Initial framing: the ideal healthcare system

According to the respondents, in their ideal healthcare system, where the boundaries of possibility and the lofty aspirations of equitable access, patient-centredness, integration, and resource sharing are not just ideals, patients can seamlessly access care, schedule appointments, access telehealth services, and securely share their health data with various providers. Resource allocation is optimised through real-time tracking and allocation algorithms, minimising waste and maximising efficiency. Dedicated care navigators facilitate comprehensive care coordination, and clinical pathways provide evidence-based treatment guidance, ensuring consistent and high-quality care. There is strict compliance with healthcare regulations and active advocacy for supportive policies (World Health Organization, 2018). Continuous improvement is driven by patient feedback and data-driven decision-making, leading to ongoing care improvements (Institute for Healthcare Improvement, 2020). Education and training programs empower providers and patients to make informed care decisions together (Levett-Jones & Bourgeois, 2018). Performance is consistently measured against Key Performance Indicators (KPIs) and benchmarked against best healthcare practice delivery (Porter & Lee, 2013). Well-documented processes and successful pilot programs achieve scalability (National Health Service, 2019).

These arrangements call for a highly collaborative approach to healthcare provision, where stakeholders, including patients, healthcare providers, payers, and technology companies, collaborate to achieve superior health system outcomes (Porter & Lee, 2013). Such a care model would involve a holistic and collaborative approach to healthcare that emphasises partnerships among healthcare providers, patients, and other stakeholders, with healthcare providers sharing available resources (World Health Organization, 2018). This model will promote shared decision-making and coordination across healthcare disciplines, adding value to the patient and provider experience (Institute for Healthcare Improvement, 2020).

Consequently, value streams and cohorts play complementary roles in which optimised processes and tailored care plans address the unique characteristics of:

1. **Patient-centric Focus:** Ultimately, the ideal model of care aims to prioritise patient needs and preferences. Patients are at the centre of the model. Consequently, the shared decision-making between patients and providers emphasises their needs and preferences to design customised care pathways and treatment plans (Choi & Chang, 2023).
2. **Patient Cohorts:** Cohort analysis helps identify specific patient groups with unique needs to identify cost-effective interventions. For example, it might reveal that elderly patients with chronic conditions require more frequent telehealth check-ins and home-based care (Smith & Jones, 2020). By recognising these cohorts, healthcare organisations can tailor their services and interventions to meet each group's needs (Brown & Wilson, 2018).
3. **Optimised Value Streams:** Womack and Jones (1997) define a value stream as the processes or activities required to design, order and provide a specific product or service and describe actions that create value or are necessary non-value-adding activities or produce no value (waste). By enhancing the quality of services, ensuring patient safety and facilitating health professionals' work, value streams operating within the symbiotic model of care would eliminate everything that adds no value to achieve an effective, flexible and reliable organisation (Womack). Thus, streamlining the patient journey would involve improving information flows between care providers, reducing administrative burdens, and ensuring patients receive timely and coordinated care (Brown & Smith, 2019). Value stream mapping and process optimisation techniques will identify bottlenecks and areas for improvement (Jones & Clarke, 2018). Payers, such as insurance companies and government programs, could also play a role in value stream optimisation by aligning reimbursement models with value-based care (Porter & Lee, 2013).
4. **Data Sharing and Integration:** In the symbiotic model of care, the seamless exchange of data and information is crucial. Sharing could involve electronic health records, patient-generated data from wearables and apps, and real-time communication between care team members (Blumenthal & Tavenner, 2010). In short, value streams and cohort management could benefit from integrated data systems that enable better decision-making and care coordination (Evans et al., 2016).
5. **Continuous Improvement:** By optimising value streams and understanding patient cohorts, healthcare organisations can provide more personalised and effective care, improving patient satisfaction and health outcomes (Womack & Jones, 1997). The model also promotes a culture of continuous improvement where stakeholders work together to refine value streams and care processes (Institute for Healthcare Improvement, 2020). Cohort analysis can identify trends and best practices shared across the healthcare ecosystem to drive improvements in care delivery (Brown & Wilson, 2018).

Thus, this model of care represents a paradigm shift in healthcare delivery, emphasising collaboration, patient-centricity, and efficient/effective use of resources. Value streams and cohorts are essential components of this model, helping to ensure that care is customised to meet the diverse needs of patient populations while delivering value and optimising processes (Porter & Lee, 2013).

### 9.2.2. Guiding principles

The guiding principles for the ideal model represent a comprehensive framework to revolutionise healthcare delivery in New Zealand. Each principle addresses a critical aspect of the desired healthcare ecosystem, aiming to create a system that is accessible, efficient, personalised, ethical, and patient-centric:

- **Accessibility and Equity**

This principle emphasises the fundamental right to healthcare for all. It strives to eliminate disparities by ensuring that healthcare services and technologies are accessible to everyone, regardless of socioeconomic status or geographic location (World Health Organization, 2018). This principle involves building infrastructure, deploying resources prioritised according to need, and bridging the gap between urban and rural healthcare facilities (United Nations, 2015).

**Accessibility:** This principle goes beyond merely providing physical access to healthcare facilities. It ensures that healthcare services are financially accessible to all individuals, regardless of their income or insurance status (Brown, 2019). It may involve policies such as subsidies, sliding-scale fees, or universal healthcare coverage. It also addresses the need for transportation and infrastructure in remote areas so everyone can access healthcare (Smith & Jones, 2020).

**Equity:** Achieving equity in healthcare means recognising that different populations may have different healthcare needs. It involves targeted interventions to address health disparities among various demographic groups (Braveman et al., 2011). Initiatives could include reducing maternal mortality rates in vulnerable populations, improving healthcare access for minority communities, and addressing social determinants of health, such as housing and education (World Health Organization, 2018).

- **Patient Empowerment**

Patient Empowerment places patients at the centre of their healthcare journey (Anderson & Funnell, 2010). Patients can actively participate in healthcare management by providing access to information, tools, and technologies. This principle encourages the development of user-friendly applications, wearable devices,

and educational resources, enabling patients to make informed decisions about their health and well-being (Anderson).

**Health Literacy:** Patient empowerment begins with improving health literacy and involves providing patients with clear and understandable information about their conditions, treatment options, and preventive measures (Nutbeam, 2008). It also includes education about navigating the healthcare system effectively (Baker et al., 2011).

**Wearable Technologies:** Patient empowerment through wearable devices and mobile apps allows individuals to monitor their health in real time. These technologies can also track vital signs and medication intake and even provide early warnings for conditions like heart arrhythmias, enabling patients to take proactive measures (Giggins et al., 2017).

- **Personalisation**

Personalisation leverages Artificial Intelligence (AI) technologies to customise healthcare solutions for individual patients. By analysing vast amounts of patient data, AI can assist healthcare providers in tailoring treatment plans and preventive care strategies and ensuring patients receive treatments optimised for their specific conditions and genetic makeup, improving the overall effectiveness of healthcare interventions (Topol, 2019).

**AI-driven Diagnostics:** Personalisation through AI means using machine-learning algorithms to analyse patient data, from genomics to lifestyle factors, to make accurate and timely diagnoses. AI can identify patterns and risk factors that human healthcare providers might miss, leading to more precise treatment plans (Esteva et al., 2019). Ethical AI Integration emphasises the responsible use of artificial intelligence in healthcare. This principle requires stringent adherence to privacy regulations and data security standards (Binns et al., 2018). It also addresses the need for unbiased algorithms, promoting fairness and equity in AI-driven decision-making processes. Transparency in AI algorithms ensures patients and healthcare providers can trust the technology, fostering confidence in its applications (Morley et al., 2020).

**Precision Medicine:** Beyond diagnostics, personalisation extends to treatment plans. Tailored treatment plans based on an individual's genetic makeup, medical history, and preferences can maximise therapeutic outcomes and minimise adverse effects (Collins & Varmus, 2015). Precision medicine also encompasses pharmacogenomics, where medications are selected based on a patient's genetic profile (Wright & Boucher, 2018).

- **Interconnectivity**

Interconnectivity focuses on the seamless exchange of information between patients, healthcare providers, and technologies. By establishing robust communication channels, healthcare stakeholders can collaborate effectively. This principle promotes using electronic health records and other digital platforms, enabling real-time data sharing. The free flow of information enhances coordination, leading to more accurate diagnoses and better-informed decisions (Adler-Milstein & Jarre, 2017).

**Seamless Data Exchange:** Interconnectivity goes beyond just having electronic health records; it involves establishing standardised data exchange protocols and ensuring the interoperability of healthcare information systems. Healthcare providers can access a patient's complete medical history, including records from other facilities and specialists, leading to more informed decision-making (Vest & Gamm, 2010).

**Telemedicine:** Besides physical interconnectivity, this principle encourages telemedicine and telehealth technologies, which can bridge geographical gaps and provide healthcare services remotely. Telemedicine extends the reach of healthcare to underserved rural areas and allows patients to access care from the comfort of their homes (Kvedar et al., 2014).

- **Continuous Innovation**

By fostering innovation, the healthcare system can stay ahead of emerging diseases and evolving patient needs since continuous innovation establishes a culture of ongoing research, development, and implementation of cutting-edge technologies. This principle encourages collaboration between researchers, healthcare providers, and technology experts, driving progress and ensuring that the healthcare system remains at the forefront of medical advancements (Deloitte, 2020).

**Research and Development:** Continuous innovation necessitates ongoing research into medical science, healthcare technology, and treatment modalities. Investment in medical research can lead to disease prevention, diagnostics, and advances in available treatments (Topol, 2019), facilitated by collaborations between academia, industry, and healthcare institutions (Chien & Chen, 2020).

**Innovation Ecosystem:** Building an innovation ecosystem within healthcare involves incentivising entrepreneurs, start-ups, and established companies to develop and implement novel solutions. For example, grants, partnerships with research institutions, and regulatory frameworks encourage innovation while safeguarding patient safety (Khorsandi, 2018).

- **Agility and Scalability**

Agility and scalability are essential in a dynamic healthcare landscape. Healthcare systems must be agile and able to adapt swiftly to incorporate new technologies and methodologies. Scalability ensures that the system can expand or contract as demand fluctuates. By adopting modular and flexible architectures, the healthcare system can efficiently integrate innovations and adjust service capacities based on evolving requirements (Friedman et al., 2022).

**Modular Systems:** Agility and scalability call for healthcare systems constructed using modular components and architectures to easily integrate new technologies, whether adopting a new medical device or implementing a novel treatment protocol. This modularity reduces the disruption typically associated with significant system upgrades (Maniar et al., 2023).

**Data-Driven Resource Allocation:** Scalability relies on data analytics to predict and allocate resources effectively. By analysing patient demographics and health trends, healthcare systems can allocate resources such as hospital beds, healthcare staff, and medical supplies where they are needed most, especially during public health crises (Verma et al., 2021).

These guiding principles form the foundation for a healthcare system that is accessible, equitable, technologically advanced, patient-centred, and ethically responsible. Implementing these principles requires collaboration between governments, healthcare providers, technology developers, and patients to create a healthcare ecosystem that genuinely serves the needs of individuals and communities while advancing the boundaries of medical science and technology.

The vision of a self-configuring health system extends far beyond traditional healthcare boundaries. It encompasses the fusion of cutting-edge technology with human expertise, offering partnerships that enhance the well-being of individuals and communities. It aspires to revolutionise healthcare as a service and a deeply personalised and anticipatory experience.

### 9.2.3. Potential delivery modes

The de facto delivery mode for healthcare services is the pipeline model, characterised by direct linear interactions between healthcare providers and patients via a step-by-step process from diagnosis to treatment and follow-up (Porter, 2010). In contrast, the platform model leverages digital technologies to facilitate interactions among multiple stakeholders in a networked ecosystem (Cusumano, 2010).

A significant strength of the pipeline model is that it ensures structured and controlled service delivery, making it easier to manage patient care and track outcomes (Christensen, 2009). The pipeline model also excels in structured environments where control and predictability are paramount (Porter & Millar, 1985), but it lacks the flexibility and scalability required in dynamic healthcare settings. On the other hand, the platform model enhances connectivity, encourages resource sharing, and fosters innovation through collaborative efforts (Parker & Van Alstyne, 2014). It facilitates interactions and exchanges between multiple stakeholders, promoting innovation and efficiency (Parker et al., 2016). Despite its strengths, it can suffer from governance and quality control issues.

### 9.2.4. Hybrid healthcare delivery

While the pipeline and platform models have their strengths and weaknesses in delivering the ideal healthcare model, it is evident that a hybrid approach might offer enhanced benefits and outcomes for patients and healthcare providers. A hybrid healthcare delivery model with the advantages of the pipeline model's structured, accountable nature and the platform model's connectivity, resource sharing, and innovation advantages offers a comprehensive approach to transforming standardised patient care to be more adaptive to individual patients' needs. More efficient resource allocation, seamless integration, and data sharing would ultimately enhance the delivery of care to patients. The Hybrid Model provides for the six critical components shown in Figure 9.1:

1. Equitable Access:
    - Goal: To ensure equal access to high-quality healthcare services for all individuals, regardless of socioeconomic status, geographic location, or other barriers (World Health Organization, 2019). For instance, a healthcare platform can ensure that triage protocols are uniformly applied across the network, fostering equitable access. The platform's extensive reach and connectivity can facilitate timely patient transfers to specialised care, addressing potential access disparities (Robinson & Casalino, 1996).
    - Importance: Equitable access addresses disparities in healthcare, promotes social justice, and improves overall population health (Braveman, 2014).
2. Integrated Technology:
    - Goal: Integration: A fundamental strength of the platform model and its hybrid delivery approach is the full integration potential. By incorporating modular pipeline elements within the platform architecture, healthcare systems can bridge gaps between siloed departments or specialties often encountered in the pipeline model. The seamless communication and coordination among healthcare providers enhance overall integration (Gawande, 2009).

Employs advanced technologies such as electronic health records (EHRs), telemedicine, and health information exchanges to improve stakeholder service delivery and connectivity (Buntin et al., 2011).

- Importance: Enhanced data sharing, care coordination, and streamlined administrative processes are enabled (Bates et al., 2014).

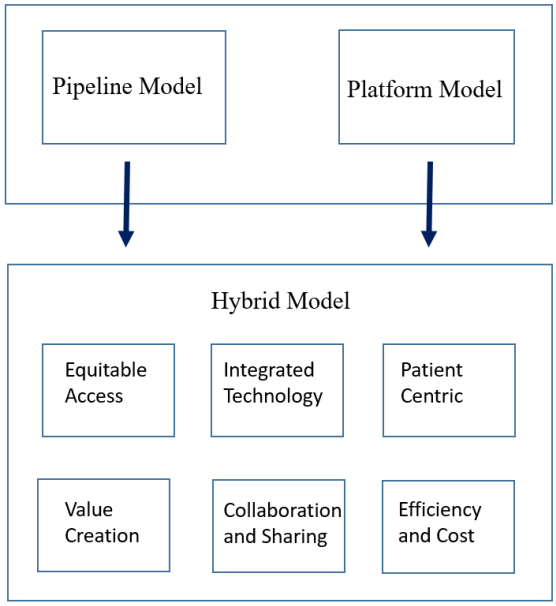



**Figure 9.1. Hybrid healthcare model**

Source: The Author

3. Patient-centric:
    - Goal: Patient-centred care aims to tailor care and patient engagement to ensure healthcare delivery personalised to individual needs and preferences (Berwick et al., 2008). Here, the hybrid model can exploit the platform's data-sharing capacities to provide a holistic view of patient information while preserving the customisation inherent in the pipeline model. By merging standardised protocols with personalised care plans, a hybrid offers a balanced strategy for patient-centred care, efficiency and patient satisfaction (Porter & Lee, 2013).
    - Importance: By merging standardised protocols with personalised care plans, the hybrid approach offers a balanced strategy for patient-centred care, enhancing efficiency and patient satisfaction (Porter & Lee, 2013). Outcomes are increased patient satisfaction, adherence to treatment plans, and improved health outcomes (Epstein et al., 2010).
4. Value Creation:
    - Goal: A well-designed platform that fosters value co-creation through collaborations between

stakeholders, including patients, providers, and payers (Porter, 2010).

- Importance: Enhances service quality, innovation, and efficiency in healthcare delivery (Christensen et al., 2009).

5. Collaboration and Sharing:
    - Goal: A well-designed hybrid model can dynamically optimise resource allocation via shared resources. By monitoring patient flows, resource availability, and demand patterns, the system can redirect resources to areas of higher need, thereby mitigating inefficiencies seen in the pipeline model. For example, if a sudden influx of patients with a specific condition occurs, the hybrid model can efficiently allocate common resources and specialist expertise to address the surge in demand (Kaplan & Porter, 2011). This flexibility promotes resource sharing, knowledge exchange, and collaborative efforts among healthcare providers and stakeholders (Parker et al., 2016).
    - Importance: Improves care integration, reduces redundancies, and enhances collective problem-solving (Cusumano, 2010).
6. Efficiency and Cost:
    - Goal: Enhanced efficiency and reduced costs through streamlined processes and technological innovations (Buntin et al., 2011).
    - Importance: Lowers healthcare costs, reduces waste, and improves sustainability of healthcare systems (Bates et al., 2014).

In summary, the hybrid model addresses the diverse needs of healthcare, promoting equitable access, enhancing technological integration, and fostering patient-centred care. In essence, the hybrid model represents a balanced approach that respects the strengths of the pipeline and platform models while addressing their limitations. It seeks to provide standardised care while preserving flexibility and customisation. Additionally, it encourages resource sharing and efficient allocation while maintaining the advantages of integration and data-sharing capabilities.

### 9.2.5. Hybrid healthcare delivery worldwide

Hybrid healthcare delivery models have been implemented successfully in healthcare settings. The following examples offer some support for adopting a hybrid approach:

1. **Kaiser Permanente:** Kaiser Permanente, one of the largest integrated healthcare providers in the United States, has embraced a hybrid model that combines elements of both pipeline and platform approaches. The organisation's use of electronic health records and a centralised data-sharing platform has

significantly improved care coordination among providers. The model has resulted in better patient outcomes, reduced hospital readmissions, and increased patient satisfaction (Chen et al., 2009; Ghorob & Bodenheimer, 2012).

2. **Singapore Healthcare System:** Singapore's healthcare system adopted a hybrid model, emphasising integration and patient-centred care. Implementing the National Electronic Health Record (NEHR) system allows healthcare providers nationwide to access patient records and share critical information, which has led to improved care transitions, reduced duplications, and better chronic disease management (Ginting et al., 2022; Lim et al., 2004).
3. **Veterans Health Administration (VHA):** The VHA in the United States embarked on a journey toward a hybrid healthcare delivery model by implementing the Veterans Health Information Systems and Technology Architecture (VistA). This combines the standardisation and efficiency of a platform model with customised clinical workflows tailored to veterans' needs. The result has been improved access to care, reduced wait times, and enhanced patient satisfaction (Lim et al., 2004; Broderick, 2013).

These real-world examples highlight the practicality and effectiveness of adopting a hybrid healthcare delivery model. They demonstrate that a balanced approach can lead to tangible benefits for patients and healthcare providers, aligning with the principles of the ideal healthcare model for New Zealand.

### 9.2.6. Adoption challenges

While the hybrid healthcare delivery model offers considerable promise, its adoption involves challenges and considerations:

1. **Implementation Costs:** Transitioning to a hybrid model often requires significant upfront investments in technology, infrastructure, and staff training. Healthcare organisations must carefully assess the financial implications and plan accordingly. Ensuring long-term economic sustainability is crucial to justify the initial expenditure (Buntin et al., 2011).
2. **Interoperability:** Achieving seamless interoperability between existing systems and the hybrid model can be complex. The success of a hybrid model depends on the ability to harmonise diverse data sources and ensure that they communicate effectively (Iroju et al., 2013); hence, data standards, protocols, and integration frameworks must be designed and implemented carefully to ensure smooth data exchanges.
3. **Privacy and Security:** The centralised nature of hybrid models necessitates robust privacy and security measures. Healthcare organisations must invest in state-of-the-art cybersecurity infrastructure to safeguard patient data, which involves implementing encryption, access controls, and regular security audits to prevent breaches and ensure compliance with privacy regulations (Sittig & Singh, 2015).

4. **Provider Buy-In:** Healthcare professionals may initially resist changes in workflows and processes. Comprehensive training and change management strategies are essential to ensure provider buy-in and successful adoption of the hybrid model. Engaging providers early in planning and addressing their concerns can facilitate smoother transitions and greater acceptance (Kotter, 1995).
5. **Regulatory Compliance:** Compliance with healthcare regulations and standards is paramount. Healthcare organisations must ensure that the hybrid model adheres to all relevant legal and ethical guidelines, including data protection laws, clinical guidelines, and industry standards, to maintain trust and avoid legal repercussions (Hudgins et al., 2013).

Real-world examples, such as those from Kaiser Permanente, the Singapore Healthcare System, and the Veterans Health Administration, demonstrate the practicality and benefits of a hybrid approach. These systems have shown how integrating traditional and modern healthcare delivery methods can improve access to care, reduce duplication of services, and enhance patient outcomes.

### 9.2.7. Symbiotic healthcare delivery

Using a holistic approach, the concept of a symbiotic network of healthcare entities, comprised of pipelines, platforms, and others, recognises that no single healthcare delivery model can comprehensively address the complete spectrum of patient requirements across their healthcare journey. Different phases of care, from preventive measures to acute interventions and chronic disease management, call for varying degrees of standardisation, customisation, integration, and resource allocation.

By encouraging collaboration among these entities and harnessing their strengths, a healthcare system concept that provides the most effective and efficient service mix for patients across their healthcare journey is realisable. Such a symbiotic network balances standardisation, customisation, integration, and resource allocation, ultimately leading to enhanced patient outcomes and a more resilient healthcare system. Establishing this network demands meticulous planning, steadfast collaboration, and continuous evaluation to adapt to the ever-evolving landscape of healthcare delivery. This network still leverages the inherent strengths of pipeline and platform models to deliver comprehensive and patient-centred care (Cavana et al., 2001; Dolma, 2010; Leotsakos et al., 2014).

### 9.2.8. Symbiotic network critical attributes

**1. Enhanced Standardisation and Customisation**

- Pipelines excel in contexts requiring standardised processes for efficiency and safety, particularly in acute care settings where protocol adherence is critical. These models ensure that high-risk procedures consistently and precisely minimise errors and enhance patient safety (Jayaratne et al., 2019; Leotsakos et al., 2014).
- Platforms can provide customised care plans for effectively managing chronic conditions. These models facilitate personalised treatment plans that cater to each patient's unique needs, improving patient engagement and outcomes (Canais & Nunes, 2024).

**2. Seamless Integration**

- Integrating pipelines within this framework smooths transitions between specialised and general care. This integration improves patient outcomes through better coordination and continuity of care (Mohr et al., 2019).
- Platforms facilitate seamless integration by enabling healthcare providers to access and share holistic patient data. This comprehensive view allows for coordinated care and informed decision-making across different care settings (Jayaratne et al., 2019; Mohr et al., 2019).

**3. Resource Optimisation**

- By adapting their resource allocation dynamically, pipelines ensure that resources are where they are most needed, enhancing the overall efficiency of the healthcare system (Chiang et al., 2023).
- Platforms are highly effective in optimising resource allocation through shared resources and efficient deployment. They enable real-time adjustments based on patient needs, reducing waiting times and optimising the use of medical resources (Chiang et al., 2023; Mizan & Taghipour, 2022).

**4. Data-Driven Decision Making**

- Integrating pipelines that adhere to standardised protocols and data capture ensures the network can harness data-driven strategies. By using accurate and comprehensive data to inform strategies and policies, integration enhances preventive care, early interventions, and population health management (Billah et al., 2016).

- By collecting and analysing vast amounts of patient data to identify trends, predict outcomes, and inform preventive measures, data in all its forms is leveraged to generate insights and support decision-making. (Chiang et al., 2023).

A symbiotic network harnesses the intrinsic strengths of the pipeline and platform models to offer comprehensive care to patients. This hybrid model integrates the efficiency and standardisation of pipeline models with the flexibility and customisation of platform models, creating a robust healthcare delivery system.

Figure 9.2 presents a schematic of the proposed symbiotic network ecosystem, illustrating how the pipeline and platform models contribute via a hybrid model that enhances standardisation, customisation, seamless integration, resource optimisation, and data-driven decision-making.

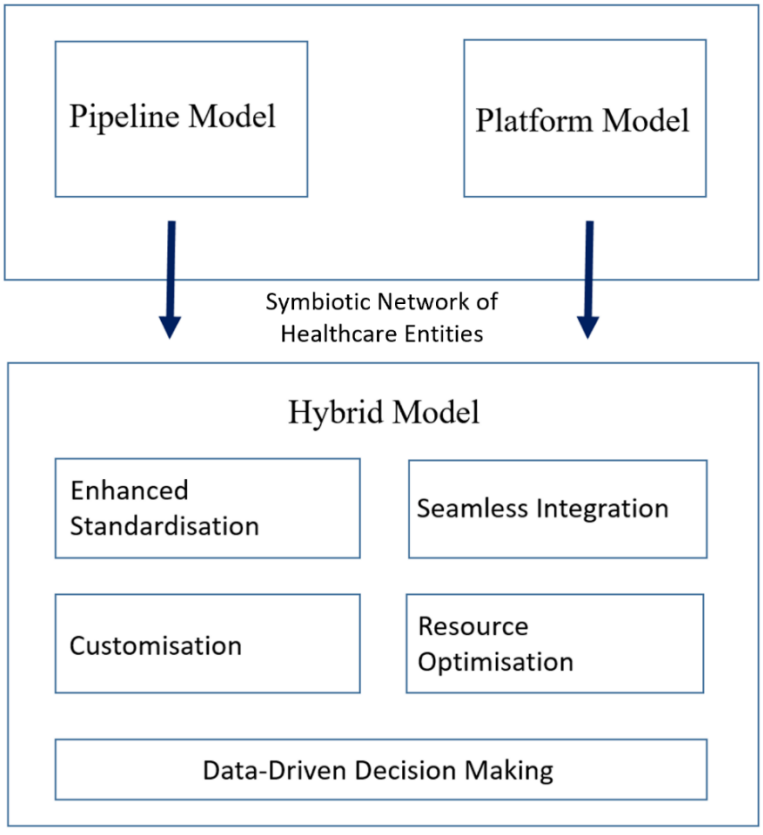



**Figure 9.2. Proposed symbiotic network ecosystem**

Source: The Author

Figure 9.3 shows the hybrid model in practice, broadly illustrating how the platform elements contribute to customised care by providing flexibility and shared resources to the present pipeline healthcare model.

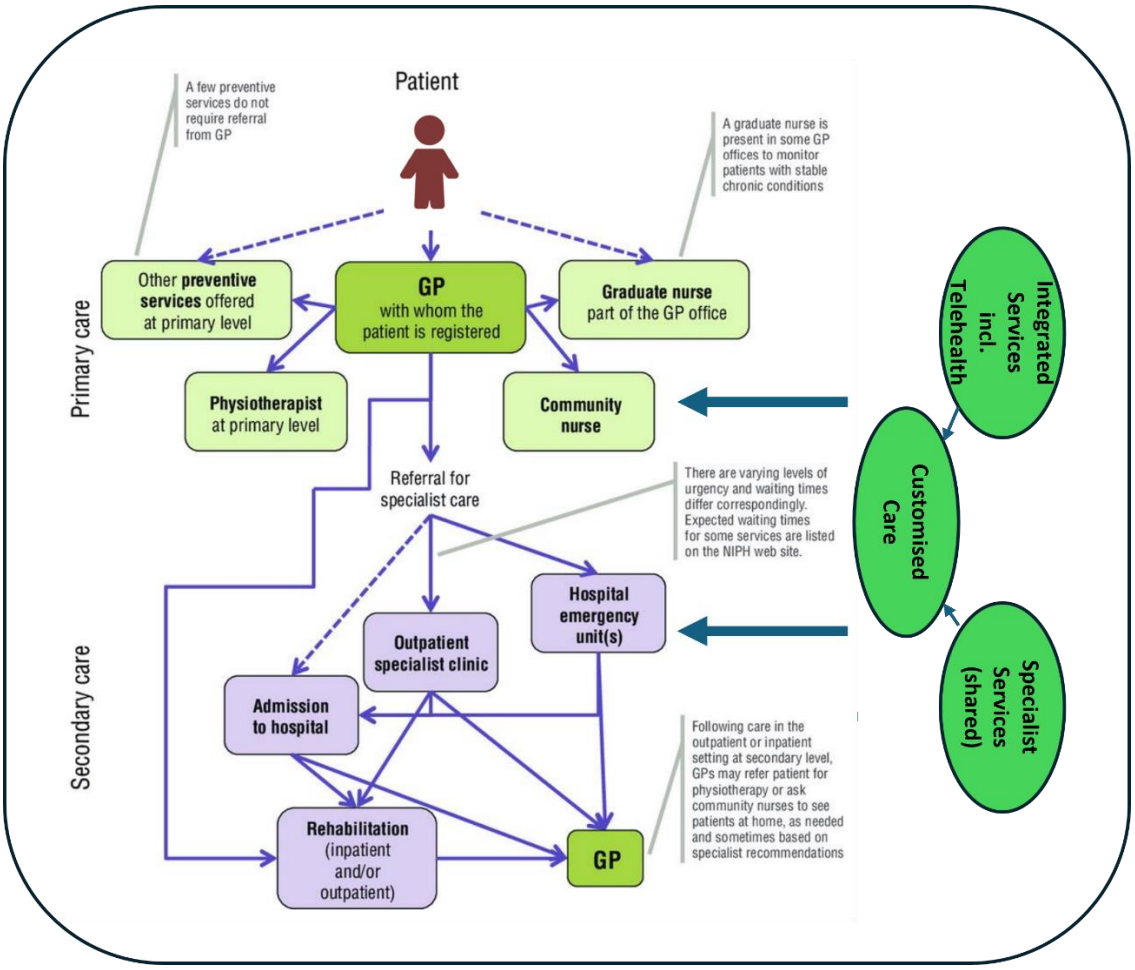



**Figure 9.3. The hybrid model in practice**

Source: The Author

### 9.2.9. Benefits of the symbiotic network

The benefits of establishing such a symbiotic network of healthcare entities are manifold and transformative:

1. **Holistic Patient-Centred Care:** Patients receive a continuum of care that adapts to their evolving needs. Preventive care, acute interventions, and chronic disease management are seamlessly woven into a patient-centric journey, ensuring every aspect is considered (Canais & Nunes, 2024; Jayaratne et al., 2019).

2. **Optimised Resource Allocation:** Resource allocation adapts dynamically to patient demand, curbing inefficiencies and enhancing access to care, ensuring optimal use of healthcare resources, benefiting both patients and providers (Chiang et al., 2023; Mizan & Taghipour, 2022).
3. **Data-Driven Insights:** Robust data sharing and analytics generate actionable insights for healthcare providers, enabling proactive interventions and sophisticated population health management. Predictive analytics can anticipate patient needs and trends, making better-informed decisions (Bahmani et al., 2021; Billah et al., 2016).
4. **Interdisciplinary Collaboration:** Collaboration among healthcare providers, irrespective of their specific model (pipeline or platform), becomes more fluid, nurturing a team-based approach to care that enhances communication, care coordination, and patient outcomes (Mohr et al., 2019; Jayaratne et al., 2019).
5. **Innovation and Adaptation:** The network fosters innovation by accommodating standardised and customised care approaches. It remains agile in responding to emerging healthcare trends and technologies, fostering a culture of continuous improvement (Canais & Nunes, 2024; Chan et al., 2014).

## 9.3. Support for the symbiotic healthcare model

Figure 9.4 extends Porter and Lee's (2013) value-based health model by mapping four fundamental symbiotic healthcare principles (equitable access, patient-centred care, integration, and efficient resource allocation) grounded in the ideal healthcare model (IHCM) onto four components of the value-based health model (organising into Integrated Practice Units (IPUs), integrating care across separate facilities, expanding excellent services across geography, and building an enabling information technology platform). The diagram demonstrates how the proposed symbiotic network 'feeds' several aspects of the value-based healthcare delivery model:

**Equitable Access**

Equitable access ensures that all individuals can access necessary healthcare services regardless of socioeconomic status. This principle aligns with the value-based health model's emphasis on expanding excellent services across geography and integrating care across separate facilities. By ensuring that high-quality healthcare services are available to all, the model aims to reduce disparities and promote health equity (Porter & Lee, 2013).

### Patient-Centred Care

Patient-centred care focuses on patients' needs and preferences, ensuring tailored care delivery to individual requirements. This principle is integral to organising into IPUs and measuring outcomes and costs for every patient. IPUs provide comprehensive care for specific medical conditions, ensuring patients receive coordinated and personalised care. Measuring outcomes and expenses allows for continuous improvement in care delivery, ensuring that patient needs are met effectively and efficiently (Porter & Lee, 2013).

### Integration

Integration, which involves the seamless coordination of healthcare services across different providers and settings, is reflected in the value-based health model's components of integrating care across separate facilities and building an enabling information technology platform. Effective integration ensures patients receive continuous and coordinated care, reducing fragmentation and improving overall health outcomes (Porter & Lee, 2013).

### Efficient Resource Allocation

Efficient resource allocation ensures that optimal use of healthcare resources achieves the best possible outcomes. This principle aligns with moving to bundled payments for care cycles and measuring outcomes and costs for every patient. Bundled payments incentivise providers to deliver high-quality care while controlling costs, promoting efficient resource use. Measuring outcomes and costs provides valuable data for making informed decisions about resource allocation (Porter & Lee, 2013).

### Current Status of the Value-Based Health Model

The implementation of the value-based health model varies significantly across different healthcare systems. While some regions have made substantial progress, others face numerous challenges that hinder transitioning from traditional fee-for-service models to value-based care.

### Challenges and Opportunities

The transition to value-based care presents several challenges, including aligning managed care executives with physicians, developing robust quality metrics, and co-investing in health information technology. These challenges require concerted efforts from all stakeholders, including policymakers, healthcare providers, and patients. Despite these challenges, there are significant opportunities for improving

healthcare delivery through value-based care. By focusing on patient outcomes, promoting efficient resource use, and fostering innovation, value-based care can lead to better health outcomes and more sustainable healthcare systems (Berwick et al., 2008).

Integrating symbiotic healthcare principles with Porter and Lee's value-based health model offers a promising framework for enhancing healthcare delivery. While the status of the value-based health model varies across different regions, the ongoing efforts to implement these principles highlight the potential for significant improvements in patient outcomes, resource allocation, and health equity. Continued commitment to value-based care, supported by technological advancements and collaborative efforts, will be crucial in realising the full potential of this transformative healthcare model.

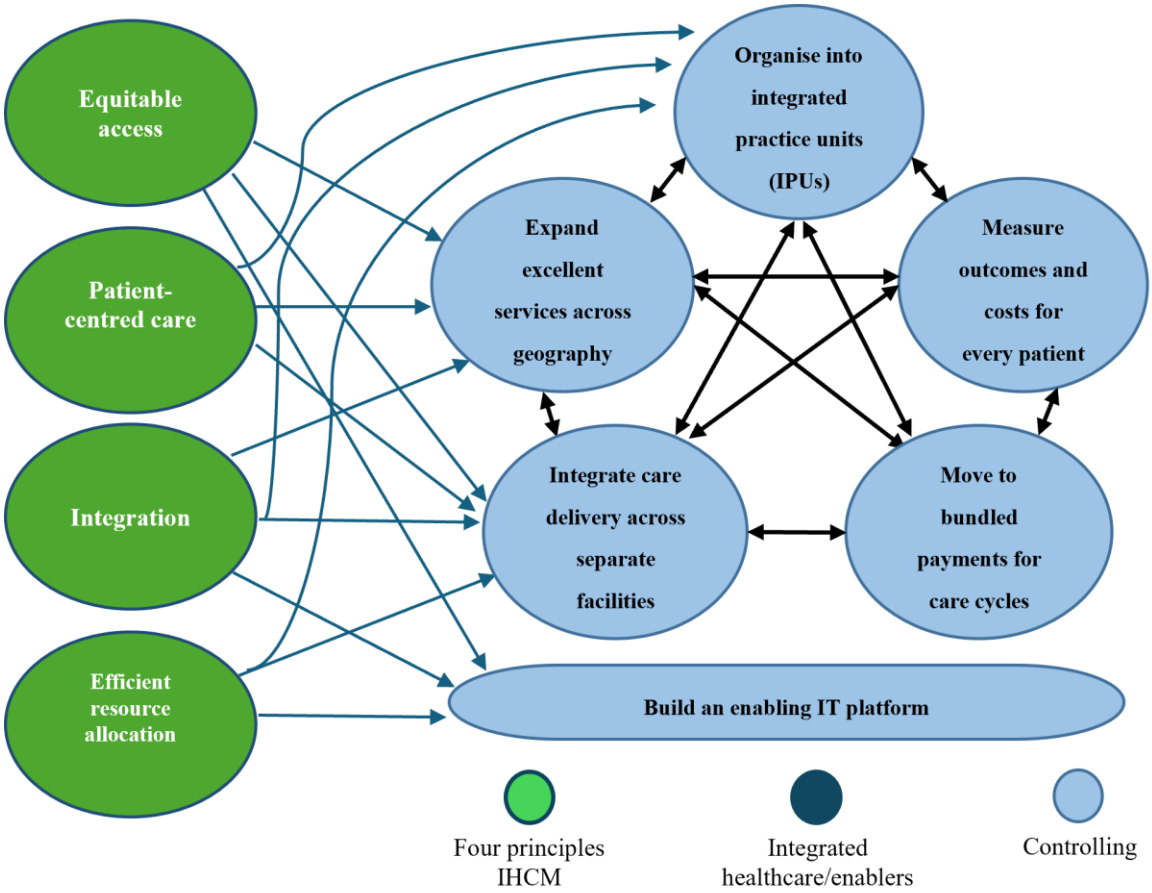



**Figure 9.4. Expanded value-based system**

Source: Adapted from Porter and Lee (2013)

### 9.3.1. Adoption challenges

While a symbiotic network of healthcare entities has potential, there are significant challenges:

1. **Complex Integration:** Integrating diverse healthcare entities, each with its unique processes, technologies, and legacy systems, can be complex and resource intensive. Achieving seamless integration requires substantial planning and investment (Billah et al., 2016; Jayaratne et al., 2019).
2. **Data Privacy and Security:** The sharing of patient data across a network raises significant data privacy and security concerns. Robust measures must be in place to safeguard patient information and adhere to regulations such as the Health Insurance Portability and Accountability Act (HIPAA) in the United States (Canais & Nunes, 2024; Chiang et al., 2023).
3. **Resistance to Change:** Healthcare professionals may resist changes to workflows and processes. Comprehensive change management strategies are indispensable to ensure buy-in and smooth transitions (Canais & Nunes, 2024; Sureshu & Vijayabhasker, 2021).
4. **Regulatory Compliance:** Ensuring the network complies with healthcare regulations and standards is critical. Legal and ethical considerations, including informed consent and data protection, must be addressed to avoid legal ramifications (Chan et al., 2014; Mohr et al., 2019).
5. **Resource Allocation and Equity:** While optimising resource allocation is a goal, ensuring equity in resource distribution across diverse patient populations remains challenging. Addressing disparities in access to care is crucial to the network's integrity (Canais & Nunes, 2024; Zhao et al., 2020).

## 9.4. Strategies for creating and maintaining the symbiotic network

### 9.4.1. Implementation success factors

The relational diagram in Figure 7.2 indicates the major success factors for ensuring the successful implementation (and maintenance) of the (espoused) ideal system. It highlights that *Change Readiness* and *Strategic Intent* are the most crucial causal factors (top 10%). *Appetite for Change* is similarly essential, given its considerable effect on the overall system.

- *Change Readiness* is a management-level (implementation) factor on the organisation side of the NOM decision framework involving the day-to-day concerns of managers in provider organisations. It concerns top management support, clinicians' attitudes to the new business model, and managers' perceptions of the need to change. *Change Readiness* is also a function of funding incentives, unconscious bias, and staff morale. *Change Readiness* strongly influences the *Systems & Processes*

effect factor, a management-level (implementation) factor on the organisation side of the NOM decision framework, concerned with decision support capability and trust in system information.

- *Strategic Intent,* an organisation-level (adoption) factor on the organisation side of the NOM decision framework, involves the senior provider organisation stakeholders. *Strategic Intent* concerns upfront investment, attitude toward patients, cooperation with other providers, and services coordinated for each clinical area. *Strategic Intent* strongly influences the effect factor *Systems Capability*, a management-level (implementation) factor on the organisation side of the NOM decision framework. *Strategic Intent* is of day-to-day concern to managers in provider organisations concerned with top management support, clinicians' attitude to the new business model, managers' perception of the need to change, funding incentives, unconscious bias, and staff morale.
- *Appetite for Change*, a national-level acceptance factor that appears on the organisation side of the framework, impacts the overall system significantly. It concerns the Medical Council's attitude, provider attitude, policymakers' desire for change, and government support.

The empirical data collected during the study explicitly support these strategic components of the symbiotic network, with concrete examples of how these considerations play out in the real world.

**Change Readiness** is a critical factor identified by several DHBs. The interviews with healthcare executives revealed that staff is more ready for transformation when top management actively promotes change initiatives. For example, an interviewee from a larger DHB noted, *"When senior leadership communicated the long-term vision and held regular forums to address staff concerns, we noticed a marked improvement in how willing people were to adapt to new ways of working."* Furthermore, in a smaller rural DHB, empirical evidence showed that **financial incentives** significantly boosted change readiness. Clinicians and managers in these areas were more open to new business models when incentives, such as payments linked to quality improvement or funding for training, were put in place. This finding supports the strategic focus on linking **funding incentives and morale** to Change Readiness.

In another instance, interviews with DHB executives revealed that systems and processes supporting **decision-making capabilities** were crucial for managing change. A clinical director shared, *"We had to trust that the data we used to make decisions—about staffing, resource allocation, and patient care pathways—was accurate and current. Our ability to transition to a new model hinged on that trust in the information systems."* This insight underscores the importance of robust decision-support capabilities within the strategic framework for effective change implementation.

The empirical data also confirmed the importance of **Strategic Intent**, with DHB executives indicating a close alignment between **upfront investments in technology** and successful coordination of services across clinical areas. One interviewee noted, *"Our early decision to invest in an integrated electronic health record system allowed us to connect different departments and specialists seamlessly, ensuring that patient information was always available at the point of care."* This illustration shows how strategic upfront investments are pivotal for achieving **system-wide cooperation** and integration of services, key elements of the symbiotic network roadmap.

Additionally, the empirical data showed strong support for **Appetite for Change**, particularly at the national level. Data from national-level healthcare stakeholders, including the Ministry of Health representatives, highlighted the importance of **policy shifts towards digital health** in fostering an environment of change within DHBs. One interviewee remarked, *"Once we had government backing and clear policy directives, our conversations with clinicians shifted from resistance to discussing how we could implement the changes effectively."* This illustration demonstrates how **government support** and national-level policies play an instrumental role in creating the conditions for systemic transformation.

### 9.4.2. Strategic considerations

Realising the vision of the symbiotic network necessitates carefully deploying several strategic considerations:

1. **Standardised Protocols:** To ensure consistency in care delivery while allowing for customisation, the development and implementation of standardised protocols and guidelines are essential. These protocols serve as a framework that all entities within the network must adhere to, ensuring uniformity in treatment approaches while accommodating individualised care when necessary (Canais & Nunes, 2024; Sureshu & Vijayabhasker, 2021). For instance, in those DHBs that implemented standardised clinical guidelines, respondents reported reduced variability in care quality and improved outcomes. One interviewee noted, *"Introducing standardised protocols helped us manage patient care more consistently, even when dealing with resource constraints in rural areas."*
2. **Interoperability:** Robust interoperability standards must facilitate seamless data sharing across all entities within the network. Ensuring patient information is accessible throughout the care continuum is critical for integrated care, which involves standardised data formats and secure data exchange mechanisms (Bahmani et al., 2021; Jayaratne et al., 2019). For example, DHBs with interconnected electronic health records saw improvements in care coordination across facilities.

3. **Resources Allocation Algorithms:** The network should employ resource allocation algorithms that factor in real-time patient needs, geographic distribution, and the availability of specialised expertise to ensure optimal allocation of resources for the benefit of patients, minimising delays and maximising the efficiency of care delivery (Chiang et al., 2023; Mohr at al., 2019). Empirical evidence showed that some DHBs used predictive analytics to improve resource allocation during peak demand, such as when considering emergency department staffing. One interviewee noted, *"By analysing past trends and current data, we could predict patient inflows and ensure that the right resources were available when needed."*
4. **Data Governance:** Establishing stringent policies is essential to safeguard patient data privacy, security, and ethical use. Compliance with healthcare regulations and data protection laws is paramount to maintaining patient trust. Effective data governance frameworks help manage data integrity and ensure responsible data handling practices (Bahmani et al., 2021; Billah et al., 2016). One interviewee noted, *"DHBs that implemented rigorous data governance protocols reported fewer breaches and improved patient confidence."*
5. **Continuous Evaluation and Improvement:** Mechanisms for constant evaluation and improvement of the network's performance are required. These mechanisms include feedback loops, outcome assessments, and the incorporation of best practices, which are vital for ensuring that the network evolves with changing healthcare needs. Regular performance reviews and adaptive strategies contribute to ongoing enhancements in care quality (Chan et al., 2014; Zhao et al., 2020). In DHBs with feedback mechanisms, respondents noted that continuous evaluation improved care quality and responsiveness to patient needs.
6. **Education and Training:** Providing ongoing education and training to healthcare professionals within the network is imperative to equip them with the skills and knowledge required to navigate the network effectively and foster collaboration among diverse entities. Continuous professional development ensures that healthcare providers stay updated with the latest advancements and best practices in the industry (Canais & Nunes, 2024; Sureshu & Vijayabhasker, 2021). DHBs that invested in continuous professional development saw greater adoption of new systems and practices. One respondent noted, *"Our training programs helped clinicians feel more comfortable with new technologies, which improved overall implementation success."*

### 9.4.3. Transformation roadmap

Typically, a business roadmap visually outlines an organisation's significant objectives and strategies, clarifying how different roles, tasks, and responsibilities come together to achieve specific goals. It provides

a high-level overview of the organisation's path, breaking down complex plans into manageable phases that everyone can understand (Creatively, 2024).

This research created a comprehensive practitioner guide that integrates macro-level policy considerations with micro-level operational strategies by integrating theoretical frameworks with empirical data from interviews and expert panels and drawing on the literature concerning best practices in healthcare transformation. The resulting roadmap outlined in **Appendix M** for the symbiotic network is built upon a rigorous triangulation of these methods and data, combining the rich qualitative insights of healthcare professionals and expert consensus derived from multiple rounds of Delphi surveys. The interviews provided context-specific, real-world examples of operational challenges faced by healthcare providers, while the Delphi surveys revealed strategic priorities. This combination of qualitative and quantitative data ensures that the roadmap is practically grounded and theoretically sound, reflecting the complex realities of healthcare delivery. Each consideration serves as a critical step toward building a cohesive network of healthcare providers and stakeholders that prioritise patient-centred care and resource efficiency:

1. **Standardised Protocols:** The development and implementation of standardised protocols form the foundation of the roadmap. These protocols establish uniform treatment guidelines. Interview and Delphi data underscored the need for standardised protocols, with 88% of Delphi panellists agreeing that variability in treatment approaches was a significant barrier to quality care (Round 2, Delphi). Respondents highlighted how a lack of consistent treatment guidelines resulted in disparities in care, especially for chronic conditions (Interview Q1_002). Delphi panellists in Round 3 further refined this consensus, emphasizing the need for these protocols to be adaptable to specific patient needs while maintaining overall consistency. The roadmap incorporates these insights by prioritising the development of standardised protocols as a critical foundational element, ensuring uniform treatment across the network while allowing flexibility where necessary.
2. **Interoperability:** Seamless data sharing is essential to the network's success. Adopting robust interoperability standards in the roadmap is positioned as an early-stage goal, enabling integrated care coordination and smooth information exchange. The empirical data from interviews and Delphi surveys revealed a critical need for interoperability for seamless data sharing. Delphi participants in Round 3 identified this as a high-priority factor, with 92% of panellists ranking it essential for improving care coordination and reducing redundancies (Delphi Round 3). One interview respondent echoed these concerns, sharing how delays in accessing patient records across providers led to repeated diagnostic tests (Interview Q1_030). In response, the roadmap sets clear timelines for adopting interoperable technologies, ensuring that secure and efficient data exchange becomes a reality within the network.

These benchmarks are grounded in real-world case studies showing reductions in redundant tests and enhanced care coordination.

3. **Resource Allocation Algorithms:** Real-time resource allocation is necessary for delivering timely, efficient care across the network. Interview data highlighted inefficiencies in resource allocation, a challenge corroborated by the Delphi survey results, where 84% of panellists agreed that real-time resource allocation algorithms could significantly enhance care delivery (Delphi Round 2). A Delphi respondent emphasised that these algorithms should be informed by patient flow data and resource availability, particularly in high-demand settings like emergency departments (Delphi Round 3). The roadmap integrates these recommendations, incorporating resource allocation algorithms as a mid-term priority. The algorithms, guided by real-time data, aim to optimise staffing and facility management. Key success performance indicators, like reduced waiting times and improved resource use, are established based on the Delphi feedback and pilot programme results.
4. **Data Governance:** Ensuring patient data privacy, security, and ethical use is a continuous process within the roadmap. Interviews and Delphi findings highlighted concerns around data privacy and governance. In Round 3, 90% of Delphi participants identified data governance as critical for ensuring patient trust and regulatory compliance. One Delphi panellist emphasised the need for clarity in governance frameworks that address legal requirements (e.g., GDPR or HIPAA) and ethical considerations in patient data use (Delphi Round 3). From these insights, the roadmap incorporates early-stage data governance frameworks focusing on audit protocols, patient consent mechanisms, and data integrity. These frameworks will develop as the network grows, with deadlines for compliance based on empirical findings from hospitals that successfully implemented data governance policies.
5. **Continuous Evaluation and Improvement:** The roadmap is a living document that evolves with feedback loops and ongoing evaluation. Both interviewees and Delphi participants identified constant feedback and improvement mechanisms as essential. In Delphi Round 3, 85% of panellists agreed that continuous evaluation is needed at every stage of network implementation to ensure adaptability and responsiveness (Delphi Round 3). One interviewee highlighted how regular outcome assessments allowed their organisation to pivot quickly when patient feedback indicated service gaps (Interview Q1_014). In reflecting these insights, the roadmap includes continuous evaluation and improvement mechanisms that systematically incorporate feedback from stakeholders, healthcare providers, patients, and payers into network operations. These mechanisms allow the roadmap to evolve based on ongoing performance reviews and emerging challenges.
6. **Education and Training:** Both the Delphi panel and interview data underscored the importance of education and training to support the effective adoption of new technologies and protocols. In Round 3, 87% of Delphi participants stressed the need for ongoing professional development, particularly in new

systems like telehealth platforms and EHR integration (Delphi Round 3). Interview respondents echoed these concerns, with one respondent noting that inadequate training on telehealth systems led to reduced adoption rates and user frustration (Interview Q2_022). The roadmap includes specific phases for rolling out education and training programs, ensuring the equipping of healthcare providers with the necessary skills to operate within the symbiotic network. The programmes align with new technologies, ensuring staff are well prepared as these systems come online. Clear objectives for workforce upskilling and knowledge-sharing initiatives are laid out in the roadmap, ensuring continual improvement and collaboration.

Combining Delphi surveys, interview data, and literature into a triangulated methodology helps to ensure the roadmap's validity and academic rigour. The Delphi method allowed for the refinement of expert consensus, ensuring that the strategic factors were theoretically sound and practically viable in diverse healthcare settings. Using measurable KPIs also ensures that each roadmap element remains appropriate. Overall, combining empirical data, theory, and expert opinion provides the roadmap with a comprehensive, evidence-based strategy for healthcare transformation that stays relevant over time.

### 9.4.4. Change readiness and strategic intent

- **Change Readiness:** The roadmap's success depends on the network's readiness to adopt and implement change. The roadmap identifies early-stage actions that build organisational readiness, including securing top management support, engaging clinicians, and aligning funding incentives. These steps are crucial for building the foundation for subsequent phases, so they feature in the initial stages of the roadmap.
- **Strategic Intent:** Strategic intent drives the network's long-term vision, and the roadmap reflects this by ensuring that each phase of implementation aligns with the overall goals of the symbiotic model. The roadmap outlines the upfront investments required for scalability and sustainability and strategies for fostering provider cooperation and improving coordination across clinical areas. This alignment ensures that all actions taken within the roadmap contribute to the network's overarching strategic objectives.

These strategic considerations inform roadmap creation, with each factor embedded into specific phases, milestones, and evaluation criteria. The roadmap ensures the network achieves its immediate goals and remains adaptable and responsive to future healthcare needs. Each consideration acts as a guiding principle, translating into concrete actions within the roadmap that collectively drive the system toward achieving the vision of the symbiotic network.

This symbiotic healthcare model provides a practical and actionable framework for healthcare leaders, policymakers, and practitioners. These strategies, underpinned by robust frameworks and continuous improvement mechanisms, will help create a symbiotic network leveraging the strengths of pipeline and platform models to deliver comprehensive, patient-centred care.

## 9.5. Model validation

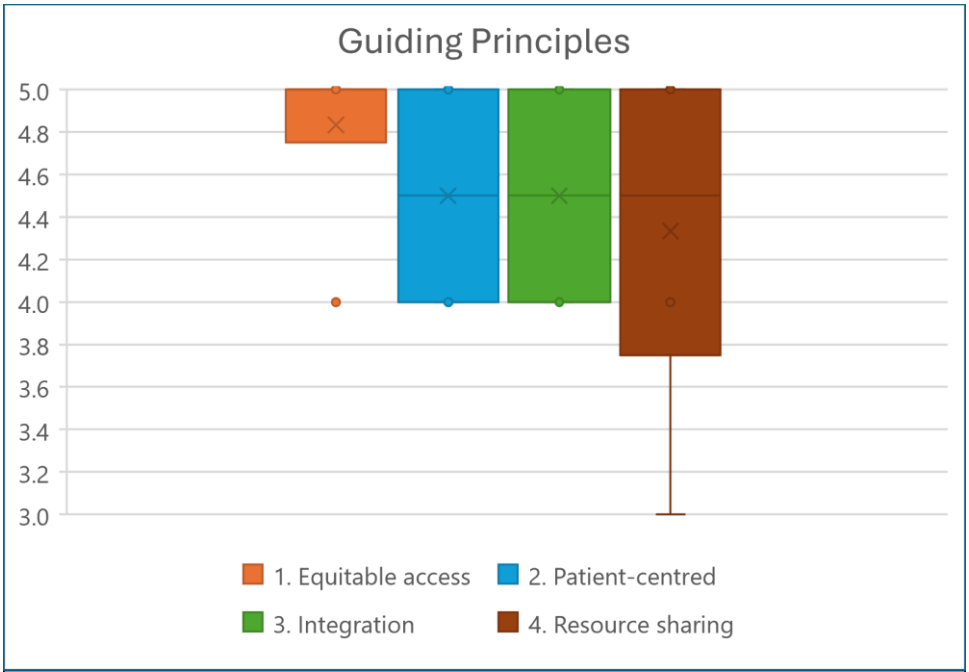
Validation processes can provide stakeholders with confidence in the model and increase trust. However, validation of a model involves diverse challenges (Brailsford et al., 2019). In contrast to validating a quantitative model using numerical data and statistical methods, e.g. discrete-event simulation, validating a qualitative model using causal theories implies validation during and following the modelling process. Rahmandad et al. (2015) highlight that further research is needed to develop more rigorous methods since statistical validation of system dynamics models may not be widespread but is essential. Consequently, Brailsford recommends that modellers perform fundamental face validity procedures at the very least.

This study's conceptual and causal relationships modelling process involved establishing face validity by periodically engaging with expert panels and senior managers throughout model development and incorporating their suggestions. Feedback on the proposed conceptual model and associated transformation roadmap was via a survey questionnaire to the original Delphi panels and interviewees, **Appendix N**. Ten interviewees and 17 expert panel members received the final questionnaire, which was pilot-tested beforehand. Notably, many original respondents were no longer in post following the latest (2024) sector restructuring. For example, all the CEOs and most finance executives had left. Consequently, the response rate was 22.2%, or six respondents.

### 9.5.1. Feedback on the ideal healthcare system characteristics for New Zealand

The box plots in Figures 9.5-9.8 indicate the distribution and skewness of the responses data set by displaying the data averages, the minimum score, the first (lower) quartile, the third (upper) quartile, and the maximum score. The Likert scale used had anchors 1: strongly disagree to 5: strongly agree.

Regarding guiding principles for the ideal healthcare system, Figure 9.5 indicates very close responder agreement that *equitable access* is the most important characteristic, followed equally by *patient-centred care* and *integration.* There is less regard for *resource sharing*, which shows the broadest range of opinions.

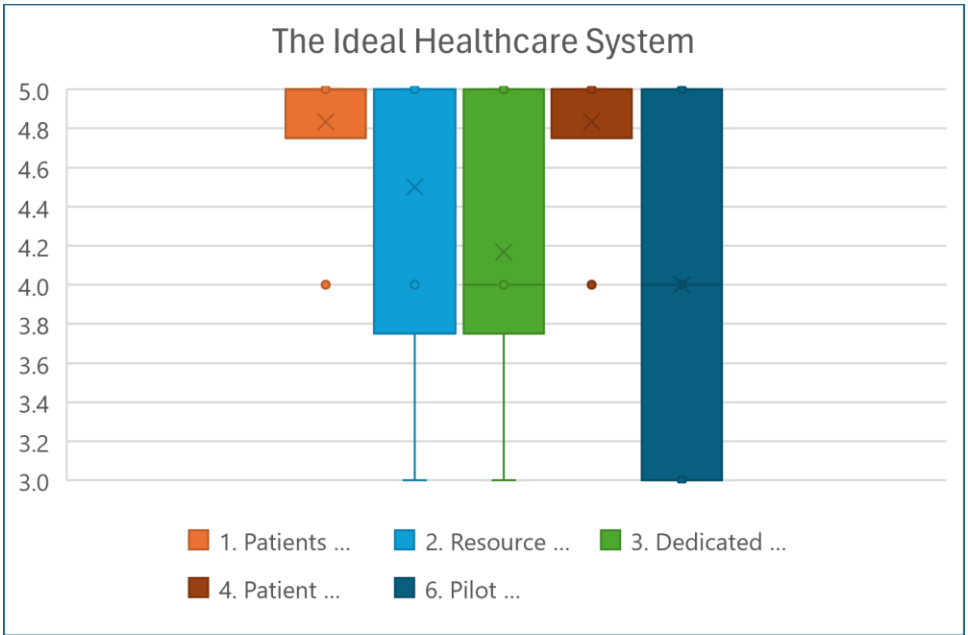



1. Equitable access to health services for all eligible individuals. A system that is equitable and accessible to anyone requiring healthcare anywhere
2. Patient-centred care. A system that truly puts patient needs at the heart of everything it does
3. Integration. An integrated system overall, where each locality contains a fully resourced and integrated health hub
4. Resource sharing. A system in which the healthcare arrangement contains a pool of resources that is accessible to everyone

**Figure 9.5. Validation of the ideal – guiding principles**

Source: The Author

Regarding ideal healthcare system characteristics, Figure 9.6 indicates very close respondent agreement that the two most important factors are that patients must be able to seamlessly access care and securely share their health data with providers. The care must be based on patient feedback and evidence-based decision-making to drive continuous improvement and ensure strict compliance with healthcare regulations. Optimised resource allocation using real-time tracking to maximise efficiency and minimise waste is of lesser importance, followed by support for dedicated care navigators facilitating comprehensive care coordination. Finally, pilot programs and well-documented processes to enable system scalability are the least important, and they attracted a broad range of opinions.

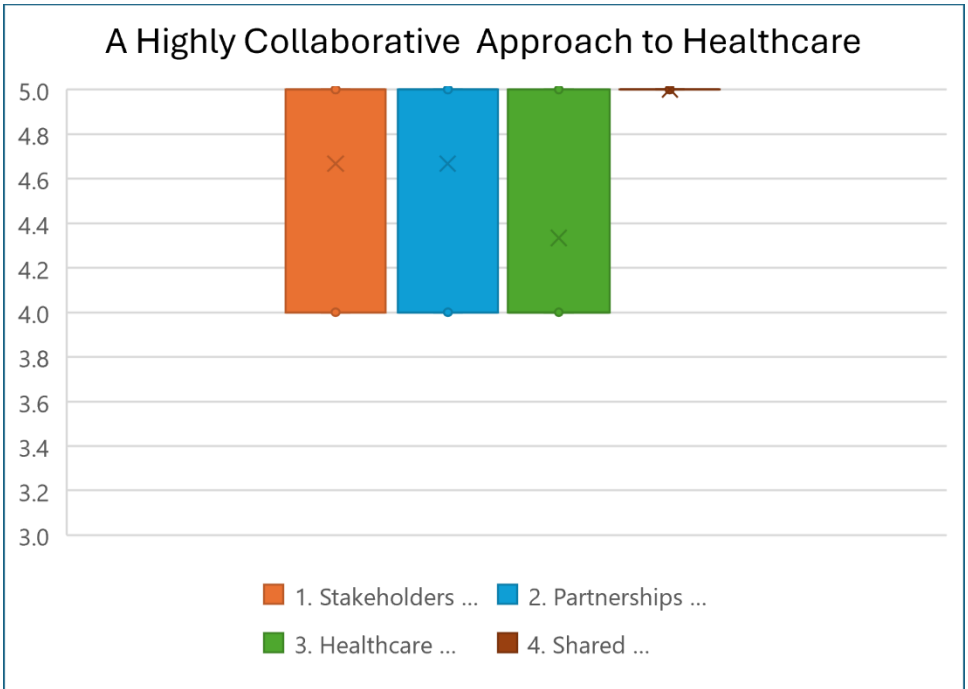



1. Patients can seamlessly access care, schedule appointments, access digital services like telehealth, and securely share their health data with providers
2. Resource allocation is optimised through real-time tracking and allocation algorithms, maximising efficiency and minimising waste
3. Dedicated care navigators facilitate comprehensive care coordination, and clinical pathways provide evidence-based treatment guidance, ensuring consistent and high-quality care
4. Patient feedback and evidence-based decision-making drive continuous improvement. Strict compliance with healthcare regulations and active advocacy for supportive policies
5. Education programs empower providers and patients to make informed care decisions together. Performance is consistently measured against KPIs and benchmarked against best healthcare practice
6. Pilot programs and well-documented processes enable system scalability

**Figure 9.6. Validation of the ideal – main characteristics**

Source: The Author

Regarding a highly collaborative approach to healthcare provision, Figure 9.7 indicates universal respondent agreement that the essential characteristic is shared decision-making and coordination across the healthcare disciplines that will add value to the patient and provider experience. There is also an equally high level of agreement that stakeholders, including patients, healthcare providers, payers, and technology companies, should collaborate to achieve superior health outcomes, and partnerships between healthcare providers, patients, and other stakeholders are required. Of slightly lesser importance is the requirement that healthcare providers share available resources.

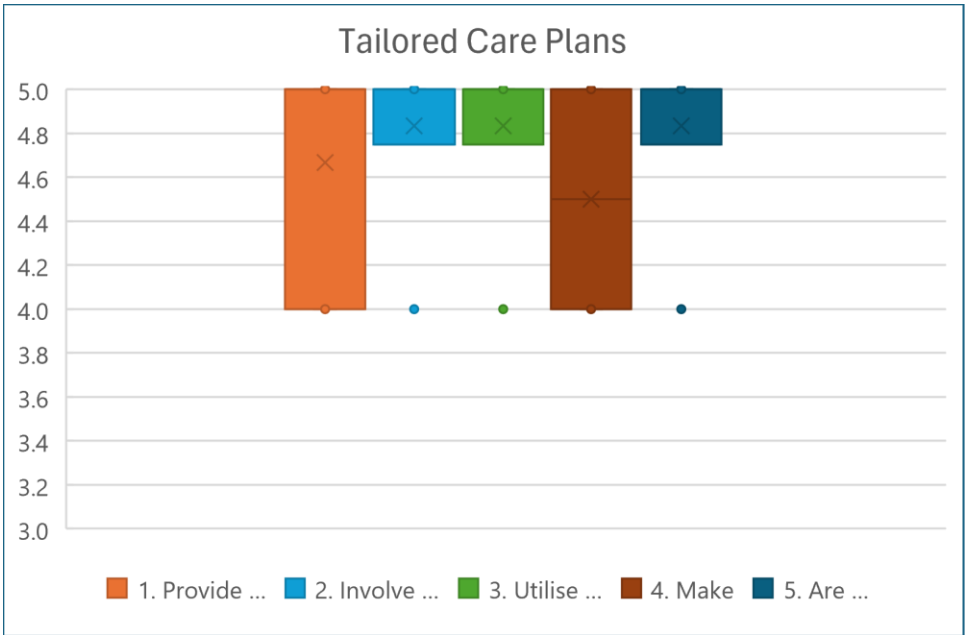



1. Stakeholders, including patients, healthcare providers, payers, and technology companies, collaborate to achieve superior health outcomes
2. Partnerships between healthcare providers, patients, and other stakeholders are the norm
3. Healthcare providers share available resources
4. Shared decision-making and coordination across the healthcare disciplines add value to the patient and provider experience

**Figure 9.7. Validation of the ideal – collaboration**

Source: The Author

Figure 9.8 indicates very high respondent agreement that tailored care plans should prioritise cohorts to identify cost-effective interventions, extensive data sharing, such as via electronic health records, patient data from wearables and real-time communication between care team members, and these plans require continuous improvement for more personalised care and improved patient satisfaction and health outcomes. Respondents also agreed to the same, although to a lesser extent, that a patient-centric focus should prioritise patient needs and preferences, which attracted a broad range of opinions. There was less support for tailored care plans utilising integrated service delivery, which attracted many opinions.




1. Provide a patient-centric focus to prioritise patient needs and preferences
2. Involve cohorts - specific patient groups with unique needs - to identify cost-effective interventions
3. Utilise extensive data sharing, including electronic health records, patient data from wearables, and real-time communication between care team members
4. Make use of integrated service delivery
5. Are continuously improved to give more personalised care and improve patient satisfaction and health outcomes

**Figure 9.8. Validation of the ideal – tailored care plans**

Source: The Author

### 9.5.2. Feedback on the hybrid model concept

Regarding the proposed symbiotic network ecosystem (**Appendix N: Figure 1**), respondents noted that:

- A dynamic, flexible and immediately responsive model to a person's needs offers enhanced patient care and outcomes, enhanced health professional job satisfaction, and standardisation of service provision, with individualisation to match individual patients' needs
- Resources will only be optimised for those who engage and know how to navigate the system

Suggestions and considerations for enhancing the model are:

- Personalised access should be based on coordination and honouring patient preferences.
- The model also needs to support equity-based decision-making
- Any pipeline model should have clear off-ramps, which raises the question of how to quickly determine value and decide to stop activities/improvements/investments that do not add value to the system
- How does this hybrid model address the importance of continuity of care, built on relationship, trust, and shared experiences, journeying with whanau over time? The medical notes do not capture all the progressively collected knowledge.
- Is there a risk that a hybrid model will lead to more fragmented, transactional care? It is not feasible to read all of someone's notes and understand their values, preferences, priorities, or medical history adequately in a hybrid model that fosters brief, separate encounters (I have never had the same Uber driver, but have had the same taxi driver in the past)
- Although agreeing that patients should be central to decision-making, this is not always practical when resources are limited, and we also need to balance that against clinician knowledge. A patient partnership rather than a patient-centric approach is the preferred expression.
- How do we capture a patient partnership outside of 'personalisation'? Personalisation can lead to expensive systems (look at the USA) instead of a more Te Ao Māori view, incorporating values of distribution and sharing. It would be good to capture that within the model, maybe under 'customisation'.

### 9.5.3. Feedback on operationalising the ideal healthcare system

Regarding governing the proposed healthcare system dynamics and the significant factors influencing the implementation and maintenance of such a system (**Appendix N: Figure 2**), respondents noted that:

- Funding and incentive levers are required to ensure change and achieve attitude shifts.

Suggestions for model enhancement are:

- (With recent events in the sector) *Available Funding* deserves prominence. Failure to adequately fund the evaluation of current processes and develop new models of care means that IT/data and digital solutions will not grow. This funding needs to be consistent and ongoing. Health wastes too

much money and human resources on activities that lose funding before realising the benefits (examples: Hira, primary care service and the funding model review)

- Trusted (verifiable) contracting for performance is required, including prescriptive standards and enforcement.
- Organisational culture is such a powerful change blocker that it deserves prominence.
- Over the past five years, there seems to be an increasingly unpredictable politicisation of healthcare. Noting that this is an ideal system, does there need to be explicit coverage of political guidance?

#### 9.5.4. Feedback on achieving the ideal healthcare system

Regarding achieving the ideal healthcare model (**Appendix N: Figure 3**), respondents felt that sequencing might be an issue:

- Specific steps in the roadmap should happen in parallel, and evaluation and measurement should be earlier (as early as Step 2) since 'you cannot manage what you do not measure', and there will be insufficient resources to improve/sustain/spread/and embed the new system
- The sequence implies that a system moves from 1 to 10. However, Step 10 (Training) is required if the previous steps are to be successful. Similarly, would capturing the pilots/proofs of concept at Step 3 be better?
- All this looks great, provided the politicians allow it!

Regarding achieving the ideal healthcare model (Appendix N: Figure 4), respondents felt that:

- Decision support should be optimised for patients, whanau, and providers, as currently, resources are very provider-centric
- Resource availability and cost to implement changes are not significant considerations in the framework (and should appear as an early step)
- A lack of understanding of measurability is a problem. Activities are still taking place that should not
- Given the practical trade-offs, 'patient-partnered' rather than 'patient-centric' is the preferred term.

The feedback indicates close agreement with the proposed healthcare model's guiding principles and main characteristics. The respondents also agreed that the conceptual model, causal diagram, and roadmap have many strengths, and they were keen to know how the platform model could be applied in health and were eager to offer suggestions. They accept and understand the model from a user's point of view and appreciate

that they can (and perhaps should) extend or modify it for their local context. Their suggestions for refinement also formed part of the final, validated model.

## 9.6. Summary

The findings illuminate critical insights that resonate with the broader discourse on healthcare transformation by pursuing understanding and analysing the intricate landscape of healthcare delivery models. Through a rigorous exploration of pipeline and platform models, their strengths, weaknesses, and the potential for symbiotic integration, a nuanced understanding of the complex dynamics shaping the future of healthcare emerges.

The conceptual and causal relationships modelling processes incorporated face validity assessment throughout. The procedure gathered opinions from the expert panel and senior managers and incorporated their improvement suggestions.

Several critical pillars, including equitable access, patient-centred care, integration, and shared resources, underpin the pursuit of an ideal healthcare model. Healthcare delivery systems worldwide have evolved, giving rise to two prominent models: the traditional pipeline model and the innovative platform model.

The findings underscore the inherent strengths of the pipeline model, characterised by its structured, linear approach to healthcare delivery. Traditional healthcare pipelines excel in providing well-defined, specialised services with a straightforward care hierarchy (Dolma, 2010). However, these strengths are set against notable weaknesses, particularly in adapting to the evolving demands of patient-centred care, integrated service delivery, and harnessing shared resources (Cavana et al., 2001; Leotsakos et al., 2014).

Conversely, the platform model presents an innovative paradigm, fostering collaboration, flexibility, and a patient-centric ethos (Canais & Nunes, 2024). Thus, each model possesses unique attributes that, when strategically integrated, could create a symbiotic healthcare ecosystem capable of delivering equitable access, patient-centred care, integration, and shared resources (Chan et al., 2014). The findings shed light on the platform's ability to transcend traditional silos, promoting holistic, integrated care experiences (Mohr et al., 2019). Nevertheless, challenges persist, particularly in standardisation, data security, and the potential fragmentation of services (Bahmani et al., 2021; Jayaratne et al., 2019).

By understanding the model's strengths and weaknesses in various contexts, decision-makers can make informed choices to ensure the optimal match between the model and the specific healthcare situation. This guidance is vital in pursuing an ideal healthcare model that integrates these pillars. The hybrid approach,

as evidenced by the findings, has the potential to harness the efficiency of pipelines and the adaptability of platforms, providing a versatile solution to the multifaceted challenges of modern healthcare (Mizan & Taghipour, 2022).

Furthermore, the findings emphasise the imperative of a context-specific approach. Healthcare ecosystems are diverse and shaped by varying cultural, structural, and technological landscapes (Billah et al., 2016). With these insights, decision-makers are better equipped to discern the most suitable model for their healthcare context (Chiang et al., 2023).

The findings of this chapter contribute significantly to the evolving narrative of healthcare transformation, moving the discussion beyond the dichotomy of pipelines and platforms and urging stakeholders to consider a synergistic coexistence. As the healthcare sector navigates the complexities of the 21st century, these findings advocate for a nuanced, adaptable, and context-aware healthcare approach that recognises the strengths and weaknesses of existing models while envisioning a future where a symbiotic blend leads to optimal patient outcomes and a resilient, responsive healthcare ecosystem.

# Chapter 10: Contributions and Further Work

## 10.1. Introduction

Given the poor state of public healthcare in New Zealand, this study challenges researchers and practitioners to expand their conceptual repertoire beyond mere cost-cutting and piecemeal improvements to consider potentially transformative business models. It invites stakeholders to consider how they ascribe meaning to behaviour, events, and environments when participating in every aspect of healthcare provision.

Specifically, the research offers answers to the following three research questions:

RQ1: What business model is best suited to delivering New Zealand's ideal healthcare system?

RQ2: What are the critical enablers and barriers to implementing such a business model?

RQ3: What can the relevant stakeholders do to address the barriers effectively?

The study began by gathering information on the underpinning theory and identifying the research gaps that ultimately defined the research problem. Primary data collected from subject matter experts in a Delphi survey and from interviews garnered expert opinion to address the lack of agreement on the ideal system for the New Zealand context and the associated system dynamics. Interviews with senior District Health Board members confirmed that *equitable access*, *patient-centred care*, *integration*, and efficient use of *shared resources* are the most valued characteristics and revealed the main implementation barriers and enablers. These principles emerged as foundational themes throughout the study, underscoring the critical elements required for a modern, effective healthcare system.

### 10.1.1. Equitable access

The study underscores the imperative of making healthcare services accessible to everyone, regardless of socioeconomic status, geographic location, or other barriers. Equitable access is fundamental to addressing healthcare disparities and promoting social justice, which involves physical access to services and financial and informational access, ensuring that all individuals have the necessary resources and knowledge to seek care when needed.

The study identifies the critical barriers to equitable access, such as socioeconomic disparities, geographic limitations, and informational asymmetries. It also explores strategies to mitigate them, including policy

interventions, community outreach programs, and deployment of telehealth services. By examining case studies of successful initiatives, the study illustrates how targeted efforts can bridge gaps in access and ensure that marginalised populations receive the care they need. Additionally, the effectiveness of various policy measures, such as subsidised healthcare plans and public health campaigns, in improving access to care is evaluated.

### 10.1.2. Patient-centred care

Central to the study is placing patients at the core of care delivery, which involves shared decision-making, effective communication, and active patient engagement, acknowledging individuals' unique needs and preferences. Patient-centred care also encompasses emotional and psychological support, recognising the holistic nature of health and the importance of treating patients as partners in their care journey. The research delves into patient-centred care procedures such as personalised care plans, patient education programs, and patient-reported outcomes. It also highlights the role of healthcare providers in fostering a culture of empathy and respect, examining the impact of patient-centred care on health outcomes, patient satisfaction, and health system efficiency. The study also discusses challenges and potential solutions in adopting patient-centred care across diverse healthcare settings, and it gathers provider insights into their experiences and perceptions of patient-centred care through qualitative interviews and focus groups.

### 10.1.3. Integration

Integration eliminates care fragmentation, improves coordination, and enhances patient experience. The findings advocate for seamless healthcare services and information sharing between various settings and providers. Breaking through the siloes calls for robust health information systems, interdisciplinary collaboration, and streamlined processes that smooth the transition of patients across and between the different levels of care.

### 10.1.4. Efficient resource allocation

Transitioning from the traditional fee-for-service models to value-based payment structures is highlighted as essential. Efficient resource allocation ensures that financial resources, personnel, and technology meet patient needs effectively, which involves data analytics to predict demand, optimise scheduling, and allocate resources dynamically based on real-time needs.

The study examines the impact of value-based payment models, such as bundled payments, capitation, and pay-for-performance, on healthcare costs, quality of care, and provider incentives. It also discusses the role

of data analytics in resource allocation, including predictive modelling, demand forecasting, and real-time decision support. By highlighting best practices and lessons learned from various healthcare systems, the study offers practical guidance for implementing efficient resource allocation strategies. The study further evaluates the impact of resource allocation strategies on patient outcomes and system sustainability.

## 10.2. Empirical contributions

### 10.2.1. Data-driven insights

One of this study's main empirical contributions is the generation of data-driven insights into the factors influencing healthcare transformation. The research variously employed thematic analysis, multicriteria decision-making analysis (fuzzy DEMATEL), and statistical analysis of administrative data to identify hidden patterns, trends, and correlations. This robust empirical evidence served as the foundation for the study's recommendations, providing a nuanced understanding of the variables that impact healthcare outcomes.

### 10.2.2. Evaluation of the interventions

The research employed a mixed-methods approach, integrating qualitative and quantitative data to assess the effectiveness of various interventions to transform healthcare systems. This comprehensive evaluation included process measures, such as implementation fidelity and the quality of care delivered, alongside outcome measures like patient satisfaction, clinical outcomes, and cost-effectiveness.

Overall, the study employed a rigorous research design, leveraging robust analytical approaches to ensure the validity and reliability of its findings. It also provides critical insights into effective interventions' scalability and long-term sustainability, offering a strategic foundation for guiding future healthcare reforms.

## 10.3. Academic contributions

The study analysed the benefits and challenges of several healthcare models, drawing on empirical evidence from successful implementations. Models included the *Integrated Delivery System*, *Accountable Care* and the *Patient-Centred Medical Home*. The findings underscore the importance of utilising data and digital technology, including electronic health records and information exchanges, to achieve integration. Case studies demonstrate how integrated care models can improve health outcomes, reduce costs, and enhance

patient experiences. The research further investigated the role of policy frameworks and financial incentives in promoting integrated care.

Thus, this study makes several significant academic contributions, particularly in synthesising fundamental principles and recommendations, recognising contextual variability, and emphasising the need for ongoing research and improvement. The theoretical frameworks brought to bear in this research further enrich the narrative, offering structured lenses to decipher the intricate dance of these factors within the healthcare ecosystem. This conceptual bridge ensures a unified thought trajectory, aligning macro-level aspirations with micro-level decision dynamics that offer a nuanced understanding of the transformative potential of healthcare systems.

Also demonstrated was how the proposed symbiotic healthcare model directly supports Porter and Lee's (2013) value-based healthcare model/strategic agenda for transitioning to a high-value healthcare delivery system.

### 10.3.1. Recognition of contextual variability

The study highlights the inherent variability in healthcare systems across regions, countries, and individual healthcare organisations. It acknowledges that a one-size-fits-all approach is inadequate for healthcare transformation. Instead, the research emphasises the importance of context-specific roadmaps tailored to the unique challenges and opportunities of each healthcare setting. This recognition underscores the study's commitment to practical, adaptable solutions sensitive to local contexts.

The research offers a comparative analysis of healthcare systems in different countries, examining the contextual factors influencing healthcare delivery, including cultural norms, regulatory environments, and resource availability. It provides detailed case studies of healthcare transformation initiatives in various settings, illustrating how contextual factors shape the implementation and outcomes of these initiatives. By highlighting the importance of contextual variability, the study contributes to developing more nuanced and effective healthcare policies and practices. The research also explores the role of stakeholder engagement in adapting solutions to local contexts.

### 10.3.2. Synthesis of best practices

The study distils critical principles that can guide healthcare system improvements by drawing on extensive literature and expert insights. It integrates theoretical frameworks with empirical evidence, creating a comprehensive guide addressing macro-level policy considerations and micro-level operational strategies.

The synthesis process involves rigorous review and meta-analysis of existing research, identifying common themes and successful strategies across healthcare contexts, and categorising best practices into thematic areas: governance, patient engagement, technology adoption, and quality improvement. By providing a structured and evidence-based framework, the research contributes to the academic discourse on healthcare transformation and offers a valuable resource for further studies. The synthesis also highlights gaps in the current literature, suggesting areas for research.

### 10.3.3. Enrichment of academic discourse

This study enriches academia by consolidating knowledge from diverse fields, highlighting the importance of context, and reinforcing the dynamic nature of healthcare. It serves as a foundation for research, policy development, and educational endeavours to advance healthcare systems and improve the well-being of individuals and communities. The study underscores the necessity of interdisciplinary approaches and the integration of diverse perspectives in addressing complex healthcare challenges.

By providing a comprehensive analysis of the pipeline and platform models, the study contributes to the academic discourse on healthcare transformation. It challenges the traditional dichotomy between models and advocates for a more integrated, context-sensitive approach that encourages further exploration of hybrids that combine the strengths of constituent models.

Recognising that healthcare transformation is a dynamic and evolving process, this study calls for continuous research and adaptation that combines rigorous policy analysis, evaluation and interdisciplinary collaboration to enhance healthcare systems over time. This commitment to ongoing research and improvement aligns with the academic ethos of continuous learning and innovation.

The study advocates for establishing long-term research programs and collaborative networks that bring together researchers, policymakers, and healthcare providers. It highlights the importance of iterative learning cycles, where insights from research inform practice, and experiences from practice, in turn, inform future research. By fostering a culture of continuous improvement, the study contributes to the sustainability and resilience of healthcare systems. The research also underscores the need for funding and support for ongoing research initiatives.

The study's academic contributions resonate with demands for enhanced healthcare worldwide, ultimately benefiting patients and society. As the healthcare landscape evolves, this research's findings and recommendations offer valuable insights for future studies. Researchers are encouraged to build on this

foundation by exploring new models of care, innovative technologies, and policy frameworks that can further enhance the delivery of healthcare services.

By emphasising the importance of context-specific solutions and continuous improvement, the research lays the groundwork for a more equitable, efficient, and patient-centred healthcare system that can meet the diverse needs of populations worldwide.

In conclusion, this research contributes significantly to the academic and practical understanding of healthcare transformation. It conceptualises a new symbiotic model for optimal healthcare delivery (shown in Figure 9.2), and it offers a comprehensive roadmap (Appendix M) for achieving the ideal healthcare model, enriched by a deep understanding of context, integrating best practices, and a commitment to continuous improvement. The resulting symbiotic healthcare model and roadmap will help healthcare leaders and policymakers navigate the complexities of healthcare transformation, providing a valuable resource for advancing healthcare systems and improving patient outcomes globally.

## 10.4. Practice-related contributions

The findings provide valuable insights into the perspectives of healthcare professionals in New Zealand that can guide the development of policies and inform research in the field. Firstly, these findings highlight the critical antecedents of successful implementation, including leadership, collaboration, and adoption of new technology, thereby offering support for studies that emphasise the role of leadership and collaboration (Mintzberg, 1980).

Secondly, the study sheds light on the challenges every senior healthcare manager in New Zealand faces and provides potential strategies to overcome them. For example, the participants highlighted the need for a more comprehensive and coordinated approach to healthcare delivery, adoption of new technologies, and innovative approaches to care delivery (Dionisio et al., 2023; Limna, 2023). Thus, the findings are consistent with studies emphasising the importance of coordination and adoption of new technologies for driving healthcare transformation.

Thirdly, the study provides insights into health professionals' roles in driving healthcare transformation and highlights the need for continued stakeholder engagement and collaboration. This finding is consistent with studies emphasising the importance of stakeholder engagement and collaboration in driving healthcare transformation (Hendy et al., 2012; Sharma et al., 2017).

A core practical contribution of this study is the development of a comprehensive roadmap for achieving the ideal healthcare system. Based on the synthesis of best practices, this structured roadmap provides a practical and actionable framework for healthcare leaders, policymakers, and practitioners.

The detailed roadmap in **Appendix M** encompasses ten critical steps for transforming healthcare delivery by implementing a symbiotic healthcare model that combines the strengths of pipeline and platform approaches and strives to create a system that prioritises equitable access, patient-centred care, and efficient resource sharing across healthcare entities. The roadmap provides a comprehensive, actionable guide for healthcare leaders, policymakers, and practitioners to operationalise this ideal model. Each step is critical in addressing the multifaceted challenges and opportunities inherent in the evolving healthcare landscape. The ten steps are:

1. **Defining the Vision and Objectives:** This step emphasises the importance of a clear, unified vision that guides the transformation of the healthcare system. The ideal healthcare model envisions a system where every individual, regardless of socioeconomic status, geographic location, or pre-existing conditions, has access to high-quality, personalised care. The vision statement functions as the guiding star for all stakeholders, providing a shared goal and ensuring that all actions align with the overarching aim of equity and patient-centeredness. Setting Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) objectives ensures that the vision translates into concrete, actionable steps. For example, one objective could be to reduce healthcare disparities in underserved communities by 30% within five years through targeted preventive care programs.
2. **Stakeholder Engagement:** A successful healthcare transformation requires the active involvement of a wide range of stakeholders. Mapping is crucial in identifying those primary, secondary, and regulatory stakeholders who are instrumental in implementing and supporting the model, with engagement strategies tailored to each group's needs and roles. For example, advisory councils may engage with patients to include their voices in decision-making processes. Healthcare providers receive continuous education and training, while technology vendors focus on fostering innovation and interoperability. Regulatory stakeholders advocate for policy, ensuring the model aligns with current healthcare standards and influences future policies.
3. **Technology Integration:** Technology is a crucial enabler of the ideal healthcare model. Ensuring interoperability between healthcare IT systems is essential for seamless data exchange across different platforms, which enhances coordination and reduces inefficiencies. Adherence to interoperability standards like HL7 (Health Level Seven) and FHIR (Fast Healthcare Interoperability Resources) ensures consistency in data sharing. User-friendly interfaces for both patients and providers are crucial to the adoption and success of the model, with features that facilitate ease of use and accessibility.

Moreover, building patient trust in the system and the security of patient data is paramount, with encryption, access controls, and audit trails ensuring compliance with data privacy regulations.

4. **Care Coordination:** Effective care coordination is central to achieving the goals of the symbiotic healthcare model. Care navigators are pivotal in liaising between patients and healthcare providers, ensuring patients receive seamless, coordinated care throughout their healthcare journey. Standardised clinical pathways ensure that care delivery is consistent, evidence-based, and aligned with best practices. By reducing variations in care, these pathways improve patient outcomes, increase safety, and optimise resource utilisation.
5. **Resource Sharing:** Efficient resource allocation is a cornerstone of the model, enabling the optimal use of healthcare resources across the network. A sophisticated resource allocation algorithm uses real-time data to match patient needs with available resources, considering patient acuity and geographic distribution factors. Real-time resource tracking ensures that critical resources, such as personnel and equipment, are efficiently allocated, minimising wastage and bottlenecks. This approach ensures that patients receive timely care, regardless of location, while improving overall system efficiency.
6. **Regulatory Compliance:** Navigating the complex regulatory landscape of healthcare is crucial for the model's success. Compliance teams ensure the model adheres to all relevant healthcare regulations, including data privacy laws and clinical standards. These teams proactively monitor regulatory changes and align the model with current requirements. Additionally, policy advocacy is a crucial strategy for influencing healthcare regulations, ensuring that policies evolve to support the model's principles, such as equitable access and the promotion of telehealth services.
7. **Continuous Improvement:** The model is built on a culture of constant improvement, drawing from methodologies like Lean and Six Sigma to optimise processes, eliminate waste, and reduce variations in care delivery. This approach ensures that the judicious use of resources and care pathways is as efficient and effective as possible. Continuous improvement is also driven by systematic patient feedback gathered through surveys, focus groups, and data analytics. Patient input refines care processes, ensuring that the model remains responsive to evolving needs and continues to prioritise patient-centred care.
8. **Education and Training:** The ideal healthcare model's success depends on healthcare providers and patients. Comprehensive training programs ensure that providers are well-equipped to navigate the model's technological and clinical demands, fostering a culture of lifelong learning and professional development. For patients, education materials covering health literacy and self-management strategies empower them to take an active role in their care, improving health outcomes and fostering patient engagement.

9. **Evaluation and Measurement:** The model's effectiveness is assessed continuously through Key Performance Indicators that measure success across multiple domains, such as patient satisfaction, clinical outcomes, and cost-effectiveness. Regular reviews of KPIs allow stakeholders to monitor progress, identify areas for improvement, and adjust strategies as needed. Additionally, the model actively benchmarks against best practices and peer organisations, ensuring that it remains at the forefront of healthcare delivery and incorporates lessons learned from others in the field.
10. **Scalability and Replicability:** The model is designed for scalability and replicability, ensuring its adoption in diverse healthcare settings. Detailed documentation of the model's design, implementation, and outcomes provides a blueprint for other organisations seeking to implement similar systems. Pilot programs that test and refine the model before large-scale implementation ensure the model's effectiveness is validated and challenges addressed. This approach facilitates the spread of the model's principles and practices, allowing other healthcare systems to benefit from its innovations.

**Appendix M** provides a visionary yet practical framework for transforming healthcare into a symbiotic network that integrates the best aspects of both pipeline and platform models. Through collaboration, innovation, and a commitment to continuous improvement, the roadmap guides healthcare stakeholders toward a future where quality care is accessible to all, regardless of circumstance. It also underscores the importance of ongoing research and improvement to adapt to the ever-changing healthcare landscape.

## 10.5. Limitations of the study and further work arising

In any research study, it is imperative to clearly articulate its limitations and assumptions to understand the scope and constraints of the findings, including their validity and generalisability (Maxwell, 2012). While this study has significantly contributed to healthcare transformation, acknowledging its limitations and pursuing new research directions is crucial for advancing knowledge and practice. Continued inquiry and collaboration will drive academic progress towards achieving the ideal healthcare model and improving healthcare systems worldwide:

- **Research Method:** One significant limitation is the lack of available data and evidence on transformed healthcare systems and their impact. This limitation limits the ability to draw definitive conclusions about transformational healthcare models' long-term benefits and potential drawbacks.

  Future research could address this gap by systematically collecting and analysing data on patient health improvements, cost reductions, and patient satisfaction levels (Greenhalgh et al., 2017).

- **Generalisability and Scope:** While this study's reliance on qualitative methods provides rich and detailed insights, it may limit the generalisability of the findings. Qualitative research often involves smaller sample sizes and context-specific analyses, which might not apply to broader populations or different healthcare settings.

  Future studies could complement qualitative approaches with quantitative methods to enhance the generalisability and robustness of the findings (Creswell & Clark, 2017).

- Another primary limitation is the scope of this research. The recommendations are grounded in general principles and best practices in healthcare transformation. However, these principles may not fully account for the heterogeneous nature of healthcare systems across different regions and settings and contextual factors such as local healthcare infrastructure, regulatory frameworks, and socio-economic conditions that limit the generalisability of the findings. Consequently, the roadmap should be considered a flexible, transformative guide rather than a one-size-fits-all solution.

  Future research should focus on developing and validating context-specific roadmaps adaptable to diverse healthcare environments. Such studies could involve empirical investigations of alternative healthcare systems to determine how contextual variables influence the applicability and effectiveness of recommendations. For example, computer simulation of the causal relationships identified in Figure 7.2, including the significant delays, would improve understanding of how such feedback relationships affect overall system behaviour.

- **Resource Constraints:** The recommendations for resource allocation and investment in data and digital technology assume that healthcare authorities have the financial and human resources to implement the initiatives. However, resource constraints may limit the feasibility of specific strategies, necessitating creative solutions and partnerships.

  Many healthcare systems, particularly in low- and middle-income countries, face significant constraints, highlighting the need for research into practical, scalable solutions for resource-constrained environments. Investigations should explore low-cost technological innovations, alternative financing mechanisms, and strategic partnerships with non-governmental organisations. Additionally, studies should assess how resource limitations impact the implementation of transformation initiatives and identify strategies to overcome these challenges.

- **Complexity of Healthcare Systems:** Healthcare systems are intricate and multifaceted, involving numerous stakeholders, policies, regulations, and layers of bureaucracy. While the transformational roadmap to achieving the symbiotic healthcare model outlines the main steps, accounting for the complexities may be difficult when implementations encounter administrative challenges, regulatory hurdles, and political complexities not fully addressed in the roadmap.

  Future research should explore the administrative, regulatory, and political complexities of implementing healthcare reforms. Detailed case studies and comparative analyses of systems facing various bureaucratic and political challenges can offer valuable insights into managing these complexities and adapting the roadmap to address real-world obstacles.

- **Unintended Consequences:** Implementing systemic changes in healthcare is fraught with the possibility of unintended consequences, such as disruptions in care delivery, unforeseen financial implications, and incentives that perversely affect healthcare providers' behaviour. These issues require healthcare leaders to remain vigilant and prepared to address them as they arise.

  These potential issues underscore the need for robust monitoring and evaluation mechanisms. Future research should focus on identifying and mitigating unintended effects through rigorous impact assessments and adaptive management strategies. Longitudinal studies examining the outcomes of healthcare reforms can provide critical feedback to refine the implementation process and minimise adverse effects.

- **Cultural and Contextual Variability:** Although the symbiotic care model and accompanying roadmap acknowledge the significance of cultural sensitivity, they may not fully capture the depth of cultural and contextual variability in healthcare systems globally. Cultural norms, beliefs, and attitudes toward healthcare can significantly influence the acceptance and effectiveness of transformation initiatives. Further research is needed to explore healthcare transformation's cultural and contextual dimensions in different settings.

  Although the roadmap emphasises cultural sensitivity, further research should investigate how cultural and contextual factors influence the implementation and outcomes of patient-centred care and other reforms. Comparative studies across different cultural settings can enhance understanding of these dynamics and inform more culturally attuned approaches to healthcare transformation.

For practitioners, the limitations of this study underscore the need for caution and nuanced approaches when implementing a transformational healthcare system:

- Practitioners should be aware of this study's constraints and proactively work to mitigate them. Enhanced learning could result through continuous monitoring and evaluation of the implementation process, fostering stakeholder collaboration, and developing supportive policies and infrastructure. By doing so, practitioners can better navigate the complexities associated with transformational change and increase the likelihood of successful implementation (Kotter, 1995).
- Healthcare institutions often have deeply ingrained practices and cultures that can hinder the adoption of new models and innovations. The difficulty in implementing and integrating transformational healthcare systems within traditional settings can pose a significant barrier. Future research should focus on understanding these barriers to change and identifying the factors that facilitate the successful adoption of new healthcare practices, including studying organisational culture, stakeholder engagement, and the role of leadership in driving change (Damschroder et al., 2009).

Understanding these constraints can guide future investigations to improve patient care quality and promote sustainable and efficient healthcare delivery systems. Addressing these limitations will help advance the field, leading to more effective and patient-centred healthcare models.

### 10.6. Other research opportunities

While this thesis has made significant strides in addressing the research questions and contributing to the body of knowledge, the pursuit of understanding as an ongoing process is acknowledged. Several critical areas for future research to advance the healthcare transformation field are:

- **Context-Specific Roadmaps:** Developing context-specific roadmaps for healthcare transformation is essential for addressing the diverse challenges facing different regions and systems. Future research should focus on creating detailed, adaptable frameworks for local cultural, economic, and infrastructural factors. Empirical studies examining the effectiveness of these tailored roadmaps can provide valuable insights and guide practical implementation strategies.
- **Resource-Constrained Settings:** Research should explore innovative approaches to healthcare transformation in resource-constrained settings, such as examining low-cost technological solutions, alternative funding models, and strategic partnerships. Investigating successful case studies from resource-limited environments can offer practical lessons and strategies for overcoming resource constraints while advancing healthcare transformation goals.

- **Policy Analysis and Evaluation:** In-depth policy analysis and evaluation are crucial for understanding the impacts of specific policy changes on healthcare systems. Future studies should include longitudinal analyses and case studies to assess the effectiveness and unintended consequences of various policies on healthcare systems. Researchers can examine case studies of policy implementations to identify lessons learned, best practices, and areas for improvement.
- **Patient-Centred Outcomes:** Research into patient-centred outcomes resulting from implementing patient-centred/patient-partnership care models is needed to evaluate their impact on patient satisfaction, engagement, and health-related quality of life. Studies should use robust methodologies to assess these models' effectiveness and identify areas for improvement.
- **Technological Advancements:** As healthcare technology evolves, research should carefully examine emergent technologies such as telemedicine, AI, and remote monitoring and how to integrate them into healthcare transformation efforts. Evaluating their impact on access, quality, and efficiency will be critical for harnessing potential benefits and addressing the associated challenges.
- **Cross-Cultural Studies:** Comparative studies across dissimilar cultural contexts can provide insights into the role of culture in healthcare transformation. Understanding how cultural factors influence the acceptance and success of patient-centred care and other initiatives will enhance the effectiveness of healthcare strategies globally.
- **Long-Term Sustainability:** Investigating the long-term sustainability of healthcare transformation initiatives is crucial for ensuring their continued success. Research should explore models and strategies for maintaining the gains achieved through transformation efforts and ensuring their resilience over time.
- **Equity Assessment:** Assessing the impact of healthcare transformation on equity is vital for ensuring that initiatives address disparities and promote equitable access, including in marginalised communities or communities of lower socioeconomic status. Research should focus on how transformation efforts affect vulnerable populations and identify strategies that assure the ideal of equitable access.
- **Interdisciplinary Collaboration:** Future research should promote collaboration among healthcare, policy, economics, sociology, and ethics experts. Such collaborations can provide a comprehensive understanding of the multifaceted nature of healthcare transformation and contribute to more holistic and practical solutions.
- **International Collaboration:** Collaborative research across countries and regions can facilitate knowledge exchange and best practices. International partnerships can lead to a broader understanding of effective healthcare transformation strategies and foster the adoption of successful practices on a global scale.

## 10.7. Conclusion

By inviting practitioners to reflect on their participation in healthcare provision, this study contributes to the ongoing discourse on healthcare delivery models. It provides valuable insights for researchers, policymakers, and practitioners navigating the complex world of contemporary healthcare and makes substantial academic contributions to the healthcare transformation discipline.

By synthesising best practices, recognising contextual variability, and advocating for ongoing research and improvement, the study provides a robust foundation for advancing healthcare systems. The findings support a nuanced, adaptable, and context-aware approach to healthcare transformation, envisioning a future where a symbiotic blend of pipeline and platform models leads to optimal patient outcomes and a resilient, responsive healthcare ecosystem. The developed roadmap offers practical guidance for healthcare leaders and policymakers, helping to align healthcare systems with the ideals of equitable access, patient-centred care, integration, and efficient resource allocation.

This comprehensive approach to understanding and addressing the complexities of healthcare delivery offers valuable insights to guide research and practice. By emphasising the importance of context-specific solutions and continuous improvement, the study lays the groundwork for a more equitable, efficient, and patient-centred healthcare system that can meet the diverse needs of populations worldwide.

Overall, this study sets the course for achieving the ideal healthcare model while acknowledging its limitations regarding context, resources, complexity, unintended consequences, and cultural variability. Further research and work in the identified areas will help address these limitations and improve healthcare systems worldwide, ultimately advancing the ideals of equitable access, patient-centred care, integration, and efficient resource allocation.

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# Appendices

## Appendix A: Ethics Committee Approval HREC(Health)2020#66

The University of Waikato
Private Bag 3105
Gate 1, Knighton Road
Hamilton, New Zealand

Human Research Ethics Committee
Ruth Walker
Telephone: +64 07 837 9357
Email:humanethics@waikato.ac.nz

THE UNIVERSITY OF WAIKATO
*Te Whare Wānanga o Waikato*

1 March 2021

Craig Green
WMS
By email: craig.green@tdh.org.nz

Dear Craig

**HREC(Health)2020#66 : Digital transformation, moving from Pipeline to platform: Enablers and barriers of creating a Platform Based Health Care System**

Thank you for your responses to the Committee's feedback. The amendments that you've made are entirely satisfactory and I am happy to provide you with ethical approval.

If you wish to make changes to your research, please send details to the committee in case further approval is required.

I wish you well with your research.

Regards,

RMD Walker

**Dr Ruth Walker**
**Acting Chairperson**
**University of Waikato Human Research Ethics Committee**

cc Dr Suzette Dyer
WMS
suzette.dyer@waikato.ac.nz

## Appendix B: Invitation to become a member of an expert panel

Dear Mr/Ms/Dr,

I am contacting you on behalf of my graduate student, who is researching a doctoral thesis entitled ***Transforming the Traditional Patient Pipeline: Status, Obstacles and Enablers***. The investigation will consider primary health sector model alternatives with the potential to transform New Zealand's current pipeline arrangements. Given recent government announcements, this is very topical. As a healthcare professional with extensive first-hand knowledge of the sector, we would be delighted if you might consider linking with this initiative by becoming a **member of our expert panel**.

This first stage of the research will involve the panel engaging in a trial Delphi survey on what a dramatically improved primary healthcare system would look like and the main implementation obstacles and enablers. Three Delphi rounds conducted over some 4-6 weeks should each take around 30 minutes of your consideration. All procedures have received ethical approval from the University of Waikato Human Research Ethics Committee, and although the panel members will share opinions, everyone's identity will remain confidential.

We appreciate that you are a busy person. However, by participating, you will receive a copy of the Delphi findings and a copy of the final report summary, including details of a framework for achieving such a transformational healthcare system. If you would like to be a member of the Expert Panel, please read the *Participant Information Sheet* below, complete the *Consent Form*, and reply to this email.

Either way, please reply directly to this email even if you do not wish to participate. If you have questions, please do not hesitate to ask. An early response would be very much appreciated.

Yours sincerely,

**Dr Eric Deakins (Research Coordinator)**

**BSc (Hons) MBA PhD**
**Associate Professor**
**University of Waikato Management School**
**Private Bag 3105**
**Hamilton**
**New Zealand**
**eric.deakins@waikato.ac.nz**

# Appendix C: Delphi Survey Questionnaire

# Trial Delphi Survey Questionnaire

***Transforming the Traditional Patient Pipeline: Status, Obstacles and Enablers.***

**Trial Delphi Survey – General Procedure**

Thank you for agreeing to take part in this Delphi survey as a member of the expert panel. We trust that you will find the process exciting and valuable. The data generated will not be subject to any public disclosure and will primarily be used as part of the original PhD research programme. Your participation is completely confidential, and your identity will remain anonymous throughout the study and beyond.

This Trial Delphi process has three related parts:

**The overall aim is for the panel to reach a consensus**

**Round 1:**

Each expert on the panel reflects on the nature of New Zealand's present primary healthcare system and its pros and cons. They then outline their vision for a 'solution' that is judged capable of completely transforming the performance of today's pipeline model of primary healthcare—to deliver superior outcomes that address the inefficiencies and community inequalities. The panel also lists the main factors likely to enable or inhibit acceptance/adoption of their solution.

**Round 2:**

The researcher analyses all the panel's responses from Round 1 and returns the collated findings to the forum as ranked lists. The panel members review their initial reactions in light of this new information (the panel tries to reach a consensus).

***Round 2a—only needed if the panel appears to be a long way from reaching a consensus:***

The researcher analyses all the panel's responses from Round 2 and returns the collated findings to the forum as ranked lists. The panel members again review their initial reactions in light of this new information (the panel tries to reach a consensus).

**Round 3:**

The researcher analyses all the panel's responses from Round 2/2a and returns the collated findings to the forum as the 'consensus solution'. The panel members reflect on this consensus 'solution and the main factors likely to enable or inhibit acceptance/adoption of the solution. Finally, the extent that each identified enabler/inhibitor factor impacts every other element is assessed.

# Appendix D: Delphi Survey Questionnaire – Round 1

***Confidential Demographic Information***

| | |
|---|---|
| **Name:** | |
| **Organisation:** | |
| **Position:** | |
| **(Years in this industry):** | |
| **(Years in your present role):** | |
| **Email:** | |
| **Date:** | |

For the benefit of the other respondents on the panel, please address all that follows carefully:

1. ***(To help get you started) Briefly reflect on New Zealand's primary healthcare system***

| ***New Zealand's current primary healthcare system (2021)*** | |
|---|---|
| **Description:** | |
| **Pros:** | |
| **Cons:** | |

2. ***Now imagine an ideal healthcare system that has been transformed for the better.***
   - ***How would such an affordable and effective primary healthcare system look?***
     - **What are the main characteristics?**
     - **What are the main advantages and disadvantages compared with the present system?**

| ***The Ideal primary healthcare system for New Zealand*** | |
|---|---|
| **Main characteristics:** | |
| **Advantages over the present system:** | |
| **Disadvantages compared with the present system:** | |

3. **Consider how this ideal future state might be achievable.**
   - **What would be the main *barriers and enablers* to introducing such a transformational healthcare system into New Zealand?**
     - **Please complete the table, being sure to rank the factors according to importance (Low, Medium or High):-**

| | **Organisation-side considerations (ranked by importance)** | **Patient-side considerations (ranked by importance)** |
|---|---|---|
| **Likely Enablers of Adoption at the National level:** | | |
| **Likely Barriers to Adoption at the National level:** | | |
| **Likely Enablers of Adoption at Organisational level:** | | |
| **Likely Barriers to Adoption at Organisational level:** | | |
| **Likely Enablers of Implementation at Management level:** | | |
| **Likely Barriers to Implementation at Management level:** | | |

**Examples:**

- **National-level issues might include (Org-side) political issues / (Patient-side) digital divide issues…**
- **Organisational-level issues might include (Org-side) change issues / (Patient-side) patient orientation issues…**
- **Management-level issues might include (Org-side) operational issues / (Patient-side) motivational issues…**

**Feel free to:**

- Explain your solution as thoroughly as you wish, although more is better for a richer picture
- Raise questions, concerns, issues and comments with the Research Coordinator

If you could return your response no later than seven days after receiving this correspondence, I would be extremely grateful.

Any questions? Contact the Research Coordinator (eric.deakins@.waikato.ac.nz)

**Thank you sincerely for your time**

# Appendix E: Delphi Survey Questionnaire – Round 2

## Delphi Survey (Round 2)

**Thank you for responding to the Delphi Survey (Round 1).**

### a. Summary of Responses from Round 1

**Q1. Briefly reflect on New Zealand's primary healthcare system for meeting today's needs.**

Respondents variously described the New Zealand primary care system as an inconsistent, directionless set of cottage-industry players, which is generally slow and unresponsive to change. It is process-driven by disease state, lacks integration, is probably unsustainable and has inadequate quality measures to benchmark consistency across care delivery. It generally serves 80% of the population reasonably well, but fails the other 20% and is overdue for transformation. Postcode health was discussed, with affluent areas having no barriers to care but poorer sectors having many obstacles to overcome, particularly in rural areas.

**Positives included:** capitation has reduced initial treatment costs; there is good value for money if you are not at the lower end of the population bell curve. Primary Health Organisations deliver great health promotions to communities and good network support staff.

**Negatives included:** generally, long-term care management plans not aligned, and care teams are disjointed in responsibilities and funding. Funding continues to be an issue. There is a lack of integration between providers: between professions (e.g., general practice and pharmacy) and within occupations (e.g., pharmacy-pharmacy and general practice-general practice). The absence of a shared health record inhibits truly integrated working and inter-professional referrals.

**Interesting Aspects:** the variation between regions, eligibility of patient needs subject to post-code, and the delivered programmes can considerably vary as there is no consistent approach.

**Q2. Now imagine an ideal, transformed healthcare system, one that is genuinely effective and affordable. Try to paint a rich picture as you describe your 'solution'.**

Rather than describing the features of an 'ideal, transformed healthcare system', many respondents focused on the desirable outcomes. These outcomes appear within the questions for Round 2, in the following section.

## b. Questions for Round 2

The purpose of Round 2 is to help respondents reach consensus around a set of health system scenarios derived from the desirable outcomes expressed in Round 1. For each scenario, we would like you to consider the features of a transformational **end-to-end healthcare SYSTEM for NZ** (primary care through to tertiary care) that would be needed to deliver the stated healthcare outcomes.

### *Q1. Scenario 1 – The ideal healthcare SYSTEM for NZ: equitable access, based on need*

| | |
|---|---|
| ***Imagine a new healthcare SYSTEM*** *in which power imbalance is tilted more in the patient's favour with barriers to treatment removed, sufficient hours of operation and funding. Here, treatment will be based on health needs and not ethnicity, age, sexual orientation, disability, residence, or employment status.* | |
| Is this vision for a new healthcare ***system*** achievable? (Please explain) | |
| What is **missing** from this healthcare system? | |
| What is **redundant** in this healthcare system? | |
| What are its **advantages** compared to the present system | |
| What are its **disadvantages** compared to the present system | |
| What are the key ***barriers*** to implementing this new system? | |
| What are the critical ***enablers*** to implementing this new system? | |

***Q2. Scenario 2 – The ideal healthcare SYSTEM for NZ: integrated and patient-centred***

| | |
|---|---|
| ***Imagine a new healthcare SYSTEM*** *that* connects spare healthcare provider capacity with healthcare consumers across the continuum of care, from primary care through to tertiary care, in a seamless way. This has achieved the integration and cooperation between healthcare providers to benefit patients. | |
| Is <u>this</u> vision for a new healthcare ***system*** achievable? (Please explain) | |
| What is **missing** from this healthcare system? | |
| What is **redundant** in this healthcare system? | |
| What are its **advantages** compared to the present system | |
| What are its **disadvantages** compared to the present system | |
| What are the key ***barriers*** to implementing this new system? | |
| What are the critical ***enablers*** to implementing this new system? | |

***Q3. Scenario 3 – The ideal healthcare SYSTEM for NZ: transformed by digital disruption***

| | |
|---|---|
| ***Imagine a new healthcare SYSTEM*** *transformed by technology, where post-code healthcare is eliminated, and access to care is available to everyone who needs it. A new healthcare SYSTEM that operates through integrated health hubs based in every town, city and region across the country, which is adequately resourced and funded.* | |
| Is <u>this</u> vision for a new healthcare ***system*** achievable? (please explain) | |
| What is **missing** from this healthcare system? | |

| | |
|---|---|
| What is **redundant** in this healthcare system? | |
| What are its **advantages** compared to the present system | |
| What are its **disadvantages** compared to the present system | |
| What are the key ***barriers*** to implementing this new system? | |
| What are the critical ***enablers*** to implementing this new system? | |

***Q4. Scenario 4 – The ideal healthcare SYSTEM for NZ: based on healthcare platforms and sharing***

| ***Imagine a new healthcare SYSTEM*** *transformed by technology* in which underutilised health-related resources are made available to providers having immediate need (similar to an Airbnb platform). | |
|---|---|
| Is <u>this</u> vision for a new healthcare ***system*** achievable? (Please explain) | |
| What is **missing** from this healthcare system? | |
| What is **redundant** in this healthcare system? | |
| What are its **advantages** compared to the present system? | |
| What are its **disadvantages** compared to the present system? | |

| | |
|---|---|
| What are the key ***barriers*** to implementing this new system? | |
| What are the critical ***enablers*** to implementing this new system? | |

Q5. Please reflect on your responses to the above scenarios to describe your own hybrid scenario for a new healthcare **SYSTEM.**

***Scenario 5 – The ideal healthcare SYSTEM for NZ: based on …***

| ***Imagine a new healthcare SYSTEM*** *transformed by …* | |
|---|---|
| Includes (amended) Scenario 1? | (Yes/No) |
| Includes (amended) Scenario 2? | (Yes/No) |
| Includes (amended) Scenario 3? | (Yes/No) |
| Includes (amended) Scenario 4? | (Yes/No) |
| Is <u>this</u> vision for a new healthcare ***system*** achievable? (please explain) | |
| What is **missing** from this healthcare system? | |
| What is **redundant** in this healthcare system? | |
| What are its **advantages** compared to the present system | |
| What are its **disadvantages** compared to the present system | |
| What are the key ***barriers*** to implementing this new system? | |
| What are the critical ***enablers*** to implementing this new system? | |

Q6. Finally, which elements should **be retained** when implementing **ANY new healthcare SYSTEM within New Zealand?**

| |
|---|
| |

***Thank you sincerely for your time.***

# Appendix F: Delphi Survey Questionnaire – Round 3

## Delphi Survey (Round 3)

**Thank you for responding to the Delphi Survey (Round 1 and 2).**

### A. Summary of Responses from Round 2

Taken together, respondents ranked the various solution alternatives as follows;

| | ***Priority*** |
|---|---|
| **Scenario 1** – The ideal healthcare system for NZ is founded upon "equitable access and need." | 3rd highest priority |
| **Scenario 2** – The ideal healthcare system for NZ is founded upon "patient-centred care." | 4th highest priority |
| **Scenario 3** – The ideal healthcare system for NZ is founded upon "integration." | 2nd highest priority |
| **Scenario 4** – The ideal healthcare system for NZ is founded upon "sharing of resources." | Highest priority |

***Round 2 of the Delphi, ranked the ideal healthcare SYSTEM for NZ is founded upon "sharing of resources" highest priority.***

The sharing of resources focused on system delivery, with systems being linked with mobile health interface on interoperable systems. Sharing of resources sees regional resourcing centres established to provide meaningful first level and advanced services, including surgical and radiology capacity. Sharing of resources (physical and intellectual) means health care must be patient-centred if equitable access and outcomes is to be achieved. Communication and networking is deemed to be an essential component, where healthcare providers work together to achieve the best patient outcomes.

**Round 3 Delphi – Enablers and Barriers**

In Round 2, you reported to us the specific factors you consider essential for successfully implementing the preferred solution. In Table 2 we now ask that you consider the extent that you believe each factor identified influences every other factor. The procedure is outlined here:

**How to complete Table 2 (The factors to consider are given in Table 3)**

**Please choose the degree of influence using the following scale:**

**None (0) Very Low (1) Low (2) High (3) Very High (4)**

**Consider Row 1 of the table abstract below:**

**The left-most cell contains a 0 value because F1 (Factor 1) has no influence on itself**

**The degree of influence of F2 on F1 has been assessed as Low (2) by the respondent**

**The degree of influence of F3 on F1 has been assessed as Very High (4) by the respondent**

**The degree of influence of F4 on F1 has been assessed as Low (2) by the respondent**

**The degree of influence of F5 on F1 has been assessed as High 3) by the respondent**

**… and so on until the end of Row 1.**

**Now consider Row 2 of the table abstract below:**

**The degree of influence of F1 on F2 has been assessed as High (3) by the respondent**

**The next cell contains a 0 value because F2 has no influence on itself**

**The degree of influence of F3 on F2 has been assessed as Low (2) by the respondent**

**… and so on until the end of Row 2**

**(Repeat the procedure for every row of the table)**

| | | F1 | F2 | F3 | F4 | F5 |
|---|---|---|---|---|---|---|
| **Row 1** | **F1** | 0 | 2 | 4 | 2 | Etc |
| **Row 2** | **F2** | 3 | 0 | 2 | Etc. | |

**B2. Now it is your turn. Please complete Table 2 below, indicating the degree of influence of each factor on every other factor.**

**The factors are given in Table 3 ON THE FINAL PAGE:**

**Table 2. Relationships between the implementation factors (refer to Table 3 below)**[2]

| Please choose the degree of influence BETWEEN THE FACTORS using the following scale:<br>None (0) Very Low (1) Low (2) High (3) Very High (4) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **F1** | **F2** | **F3** | **F4** | **F5** | **F6** | **F7** | **F8** | **F9** | **F10** | **F11** | **F12** | **F13** |
| **F1** | 0 | | | | | | | | | | | | |
| **F2** | | 0 | | | | | | | | | | | |
| **F3** | | | 0 | | | | | | | | | | |
| **F4** | | | | 0 | | | | | | | | | |
| **F5** | | | | | 0 | | | | | | | | |
| **F6** | | | | | | 0 | | | | | | | |
| **F7** | | | | | | | 0 | | | | | | |
| **F8** | | | | | | | | 0 | | | | | |
| **F9** | | | | | | | | | 0 | | | | |
| **F10** | | | | | | | | | | 0 | | | |
| **F11** | | | | | | | | | | | 0 | | |
| **F12** | | | | | | | | | | | | 0 | |
| **F13** | | | | | | | | | | | | | 0 |

**B4.** Last but not least, we appreciate that this has been a workout and appreciate all your efforts. We are keen to improve our procedures, so we now invite you to reflect on the process we put you through. **Please provide any feedback you might have on all three rounds, including what worked well and what could be improved.**

**The Process**

**The Contents**

**The Interactions**

***Thank you sincerely for your time. We will be in touch with a summary of findings once we have them.***

[2] You may prefer to complete the Excel spreadsheet we sent to you, instead

**Table 3. Success Factors for implementing the 'ideal solution' described in B1.**

| Factor | Concept | Indicators |
|---|---|---|
| **National-level (Acceptance) Factors – Organisation-side** | | |
| F1 | Appetite for change | NO1 = Medical Council attitude<br>NO2 = Provider attitude<br>NO3 = Policymaker appetite for change<br>NO4 = Government support for the effort<br>NO5 = Nationwide Internet provision |
| F2 | Available Funding | NO6 = Sector funding size<br>NO7 = Agreed division of resources<br>NO8 = Targeted funding for highest needs |
| F3 | Governance | NO9 = Agreement on governance and consents<br>NO10 = Recent health and disability review outcomes/pending legislation<br>NO11 = Quality of leadership<br>NO12 = Quality of communication |
| F4 | Industry structure | NO13 = Decentralised and independent healthcare entities<br>NO14 = The National Health Information Platform (Hira) and Telehealth |
| **Organisation-level (Adoption) Factors – Organisation-side** | | |
| F5 | Strategic intent | OO1 = Upfront investment<br>OO2 = Attitude to patients<br>OO3 = Cooperation with providers<br>OO4 = Services coordinated for each area |
| F6 | Provider relationships | OO5 = Shared physical resources<br>OO6 = Shared intellectual resources<br>OO7 = Health burden shared with allied health services (e.g. pharmacists) |
| F7 | Systems capability | OO8 = Proactive-care platforms (telehealth)<br>OO9 = Integrated healthcare systems<br>OO10 = Common data standards across partner organisations |
| **Management-level (Implementation) Factors – Organisation-side** | | |
| F8 | Change readiness | MO1 = Top management support<br>MO2 = Clinicians' attitude to the new business model<br>MO3 = Managers' perception of the need to change<br>MO4 = Funding incentives<br>MO5 = Unconscious bias<br>MO6 = Staff morale |

| | | |
|---|---|---|
| F9 | Systems and processes | MO7 = Decision support capability<br>MO8 = Trust in the system information |
| F10 | Accountability | MO9 = Transparent end-to-end accountability |
| **Organisation-level (Adoption) Factors – Patient-side** | | |
| F11 | Strategic intent | OP1 = Communication of strategic change<br>OP2 = Patient demand for more/better healthcare<br>OP3 = Cost to the patient |
| F12 | Systems capability | OP4 = IT platforms that offer convenience (e.g. telehealth) |
| **Management-level (Implementation) Factors – Patient-side** | | |
| F13 | Systems and processes | MP1 = Patient trust in the information systems<br>MP2 = Access to a smart device/phone |

# Appendix G: Semi-Structured Interview Guide

- **Preferred method of interview**: In-person. Alternatively, if necessary, the interview can be scheduled via Team/Zoom.

***[Read the following script to the interviewee prior to commencing the interview]:***

As you know, my study is concerned with discovering a more effective healthcare system for New Zealand and understanding its practical feasibility. It follows on from a Delphi study with health professionals involved with Telehealth.

The interview will take 60 minutes, and it has two main parts. Part 1 covers today's health sector challenges and practices, and Part 2 concerns the likely barriers and enablers of your favoured healthcare system alternative.

There are no right or wrong answers, and your answers are confidential. Every document, recording and transcription will be treated in the strictest confidence, and the identities of every participating organisation and individual will be made anonymous. Your responses and those of other healthcare Executives will be recorded and transcribed, before being analysed to identify common themes.

Only my supervisors and I will be privy to the data collected, which will be stored securely for five years and then destroyed.

The consent form that you signed explains this research study in more detail, including the risks, benefits, compensation, and how confidentiality will be maintained.

**Do you have any questions at this time?**

**Notes:**

**Part 1:**

**Today's health sector challenges and practices**

In this context, the patient pipeline model refers to the current healthcare system, in which we see a constant flow of patients entering our Emergency Departments, being admitted to the ward, entering our General Practices, and being referred to our specialist services.

1. What are the key benefits of New Zealand's current healthcare system?
2. Do you perceive the need to transform today's healthcare system?
    - If so, what do you see is required to effect enduring transformation of the New Zealand healthcare system?

**Part 2:**

**The barriers and enablers of a transformational healthcare system alternative**

***[hand over a copy of the Accenture Model and be prepared to elaborate on it for health]***

This diagram illustrates a platform business model and a traditional pipeline model

3. What is your understanding of how a platform-based business operates?
4. What would be the main benefits of adopting a platform business model for healthcare provision in New Zealand, rather than keeping with today's pipeline model?
5. What would be the main disadvantages of adopting such a platform business model?
6. Regardless of whether such transformational change is possible, what do you see as the critical success factors for sustaining organisational change within the healthcare sector?

***[Now reveal the healthcare system components most preferred by the Delphi panel]***

***This diagram outlines the healthcare system components that were most favoured by the Delphi panel. Please read through the descriptions.***

**Notes:**

**Component 1**
***Guiding Principle:***
The ideal healthcare system for New Zealand is founded on the principle of **"equitable access."**
***Vision Statement:***
**A healthcare system** where treatment is based on need, not ethnicity, age, sexual orientation, disability, location, or employment status. Power imbalances are tilted more in the patient's favour, and **barriers to treatment** are removed.

**Component 2**
***Guiding Principle:***
The ideal healthcare system for New Zealand is founded on the principle of **"patient-centred care."**
***Vision Statement:***
**A healthcare system** that connects healthcare providers seamlessly with healthcare consumers across the continuum of care, from primary care to tertiary care.

**Component 3**
***Guiding Principle:***
The ideal healthcare system for New Zealand is founded on the principle of **"integration."**
***Vision Statement:***
**A healthcare system** that is adequately resourced and funded, and transformed by technology. It operates via integrated healthcare hubs in every town, city and region across the country.

**Component 4**
***Guiding Principle:***
The ideal healthcare system for New Zealand is founded on the principle of **"sharing of resources."**
***Vision Statement:***
**A healthcare system** in which unused/underutilised health-related resources are dynamically available to healthcare providers with immediate need (via platforms similar to Airbnb, for example).

7. *How would you rank these components by importance (1 being least important and 4 being most important)?*

| | ***Ranking: 1 = least important; 4 = most important*** |
|---|---|
| **Component 1:** The ideal healthcare system for NZ is founded on the principle of **"equitable access."** | |
| **Component 2:** The ideal healthcare system for NZ is founded on the principle of **"patient-centred care."** | |
| **Component 3:** The ideal healthcare system for NZ is founded on the principle of **"integration."** | |
| **Component 4:** The ideal healthcare system for NZ is founded on the principle of **"sharing of resources."** | |

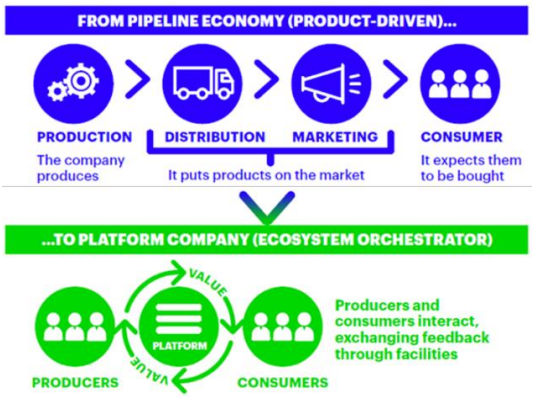
***[Might need to consider the possibility of them wanting more than one component, when asking the following questions]:***

The final batch of questions concern the component(s) you have ranked highly:

8. Can you paint a picture of what this healthcare system would look like, overall?
9. Is this healthcare ***system*** achievable? (please explain)
10. What is **missing** from it, and why?
11. What is **redundant** in such a healthcare system, and why?
12. What main **mechanisms** would be needed, to deliver the stated outcomes?
13. What stakeholder **behaviours** would be needed, to deliver the stated outcomes?
14. What aspects of the present New Zealand healthcare system must a new system retain at all costs?
15. Do you have any thoughts about the barriers to transforming today's healthcare system from a pipeline to a platform model?
16. Do you have any thoughts about the enablers?

***Summarise the main points of the interview—the main things heard, then ask if he/she would like to add or change anything they have said.***

***Thank you…***



# Appendix H: Letter to the Chief Executive

Dear Mr/Ms (Chief Executive)

I am undertaking doctoral research at the University of Waikato as part of a PhD Programme. My study is entitled Transforming the Traditional Patient Pipeline: Status, Obstacles and Enablers.

I am seeking your permission to gain access to your DHB site(s) as well as consent to interview six executive members of your DHB to take part in a 60-minute, semi-structured interview. The six executive members include the Chief Executive, Chief Financial Officer, Chief Medical Officer, Chief Operating Officer, GM/Director Hauora Māori and Chief Information Officer. The questions, which derive from an earlier Delphi study, concern present health sector practices and challenges and the barriers and enablers of an alternative (platform-based) healthcare model.

I will use this information to write a PhD thesis and disseminate the findings in articles and presentations. The identities of every participating organisation and interviewee will be disguised to ensure confidentiality, and all documents, recordings and transcriptions will be treated in the strictest confidence.

Only the Researcher and my supervisors will be privy to the data collected, which will be stored securely for five years and then destroyed. The University of Waikato Human Research Ethics Committee has approved the procedures—application number HREC(Health)2021#67.

Agreement to take part in this study would be greatly appreciated, and your organisation will incur no costs. To do so, you need only reply to this email in the affirmative. I will follow up with a phone call when I will be delighted to receive a list of potential interviewees and address any questions.

Finally, please reply to this email even if you do not wish your organisation to participate. An early response would be very much appreciated.

Yours sincerely,

Craig Green
Primary Researcher


Craig Green
Chief Financial Officer
Group Manager Finance, Procurement and Facilities
Tairāwhiti District Health Board
BBS-Acctg; PGDipProfAcc; CA; MBA; ALT

# Appendix I: Participant Information Sheet


## Participant Information Sheet

### Title
***Transforming the Traditional Patient Pipeline: Status, Obstacles and Enablers***

### Purpose
This research is a partial requirement for a PhD in Management Systems at the University of Waikato.

### What this research study is about
This study involves consideration of new business models with the potential to transform New Zealand's pipeline model of primary healthcare. It aims ultimately to propose an acceptance/adoption model for achieving superior healthcare outcomes.

Specifically, this research will:
- Investigate perceived obstacles and enablers to transforming NZ's traditional pipeline model of healthcare provision. For example, a platform-style business model would require (DHB) producers and (DHB) consumers to be linked dynamically
- Use the knowledge gained to formulate a new healthcare business model that offers equitable, accessible, and financially sustainable healthcare.

### What will you have to do, and how long will it take?
You will be asked to complete three rounds of survey questionnaires, each of which should take no longer than *30 minutes* to complete. The researcher may also request documents and other sources relevant to the study. You will be asked to give your consent before completing the questionnaires.

### What will happen to the information collected?
The researcher will use the collected information to write a PhD thesis and disseminate the findings via articles and presentations. The identities of participating organisations and respondents will always be disguised to ensure confidentiality. The researcher will also treat any documents, recordings and transcriptions in the strictest confidence. Only the researcher and supervisors will be privy to the contents, which will be stored securely for five years and then destroyed.

### Declaration to participants
Please note that participation is voluntary.
If you agree to take part in the study, you have the right to:
- Refuse to answer any question
- Withdraw from the study at any time up to three weeks from the date of the final Delphi round
- Ask further questions about the study anytime during participation
- Be given access to a summary of the findings.

### Who is responsible?
The researcher will perform the research. No funding agencies or sponsors are associated with this research.

If you have questions or concerns about the project, please contact the person who sent you this email (eric.deakins@waikato.ac.nz).

## Appendix J: Participant Consent Form


# Consent Form for Participants

***Transforming the Traditional Patient Pipeline: Status, Obstacles and Enablers.***

***Declarations:***

- I have read the *Participant Information Sheet* for this study, and I understand its contents
- Any questions that I had regarding this study were answered to my satisfaction, and I understand that I may ask further questions at any time
- I understand that I am free to withdraw from this study at any time, and I can decline to answer any question asked of me
- I also know that I can have any information that I provided removed up to three weeks following the final Delphi round.

***Please <u>delete</u> one of the following before emailing the response:***

Yes—I agree to participate in this study under the conditions set out in the Participant Information Sheet

Or

No—I do not wish to participate in this study

**Name:**

**Date:**

**Thank you very much for your consideration.**

# Appendix K: Ethics Approval HREC(Health)2021#67

The University of Waikato
Private Bag 3105
Gate 1, Knighton Road
Hamilton, New Zealand

Human Research Ethics Committee
Roger Moltzen
Telephone: +64021658119
Email:humanethics@waikato.ac.nz

THE UNIVERSITY OF WAIKATO
*Te Whare Wānanga o Waikato*

31 August 2021

Craig Green
WMS
By email: craig.green@tdh.org.nz

Dear Craig

**HREC(Health)2021#67: Transforming the Traditional Patient Pipeline into a Platform-based Healthcare System: Status, Obstacles and Enablers**

Thank you for your responses to the Committee feedback.

We are now pleased to provide formal approval for your project.

Please contact the Committee by email (humanethics@waikato.ac.nz) if you wish to make changes to your project as it unfolds, quoting your application number with your future correspondence. Any minor changes or additions to the approved research activities can be handled outside the monthly application cycle.

We wish you all the best with your research.

Regards,

**Emeritus Professor Roger Moltzen MNZM**
**Chairperson**
**University of Waikato Human Research Ethics Committee**

# Appendix L: NVivo Thematic Coding

| Theme | Sub-Theme | Question | Interviewee | Quote |
|---|---|---|---|---|
| **Patient-Centred Care and Improved Access** | Improved Access to Care | What improvements are needed in access to healthcare? | 1 | Telehealth is a great tool for improving access, especially for rural areas, but there needs to be investment in infrastructure to make it work. |
| | | | 2 | Patients living in remote areas face huge gaps in follow-up care. We need to prioritize home care services and better post-discharge support. |
| | | | 3 | If we focus on the patient, improving access will follow. It's about giving them control, enabling their involvement in care decisions. |
| | Patient Engagement and Participation | How can we ensure patients are more engaged in their care? | 4 | Involving patients in decision-making is essential. If they have a say in how they receive care, their engagement levels go up. |
| | | | 5 | We need to move away from a one-size-fits-all model and allow patients to choose the type of care and where they receive it, whether at home, through telehealth, or in clinics. |
| | | | 6 | Patient-centred care means putting the patient's preferences and needs first. It's not just about convenience; it's about improving outcomes by empowering them. |
| **Addressing Inequities** | Reducing Healthcare Disparities | How can we address healthcare inequities in New Zealand? | 1 | Rural populations, Māori, and Pacifica communities are still left behind in our system. We need targeted programs to reduce these disparities. |
| | | | 2 | Equitable access means bringing resources to where they're needed the most. Marginalized populations shouldn't be an afterthought. |
| | | | 3 | Addressing inequities involves more than providing the same service to everyone. We need to tailor healthcare to meet the needs of our diverse population. |
| | Tailored Healthcare for Marginalized Populations | Q2: How can we ensure marginalized groups receive equitable care? | 4 | The Māori and Pacifica populations need healthcare that's culturally sensitive and locally available, not just a Western model imposed on them. |

| | | | | |
|---|---|---|---|---|
| | | | 5 | Reducing inequities involves a shift in resource allocation. More investment in primary care for underserved communities is crucial. |
| | | | 6 | We need to focus on specific challenges faced by marginalised groups. It's not about treating everyone the same but ensuring everyone has the same opportunities to access care. |
| **Transforming the Healthcare System** | Bureaucracy and System Change | Q3: What are the key areas that need transformation in the healthcare system? | 1 | The current system is far too bureaucratic. The administrative layers slow down decision-making and create inefficiencies. |
| | | | 2 | Transformation needs to start with breaking down the silos and improving communication between different sectors of healthcare. |
| | | | 3 | True transformation is not just about adding more technology, it's about changing the way we think about patient care and how we structure the system. |
| | Seamless Care and Continuity | Q3: How can the healthcare system ensure better continuity of care? | 4 | Patients get lost in the system. We need better coordination between providers to ensure that care transitions are smooth and that there's continuity. |
| | | | 5 | Too often, patients fall through the cracks because different parts of the healthcare system don't talk to each other. An integrated approach is critical. |
| | | | 6 | Improving continuity of care means creating a system where patients are followed through all stages of their healthcare journey. Right now, the system is fragmented. |
| **Integration and Collaboration** | Breaking Down Silos | Q4: How can we improve collaboration between healthcare providers? | 1 | We need to break down the silos between specialties and different parts of the healthcare system. Digital solutions can play a big role in that. |
| | | | 2 | Integration between primary and secondary care is crucial. Right now, there's a lot of duplication and inefficiency. |
| | | | 3 | To improve patient outcomes, we need better collaboration across all sectors, from GPs to specialists. That includes information sharing and coordinated care. |
| | Use of Digital Solutions for Integration | Q4: How can digital solutions aid in better | 4 | Digital solutions, like shared electronic health records and scheduling systems, |

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| | | integration and collaboration? | | can bridge the gap between healthcare providers. |
| | | | 5 | Telehealth and electronic records are essential tools for creating a more integrated system. If done right, they can reduce fragmentation. |
| | | | 6 | Technology has the potential to link different healthcare providers, ensuring that patient data is accessible and that transitions between care providers are seamless. |
| **Financial Investment and Resource Management** | Effective Resource Allocation | Q5: How should resources be managed to support healthcare transformation? | 1 | Our current system is too focused on hospitals and secondary care. We need to reallocate resources to prevention and community-based services. |
| | | | 2 | Centralizing resource management, especially for things like IT infrastructure, could lead to more efficient use of resources across the system. |
| | | | 3 | We need a better balance between funding for tertiary services and preventive care. Right now, we're overburdening hospitals while neglecting primary care. |
| | Re-evaluating Funding Models | Q5: How can funding models be improved to support a platform-based healthcare model? | 4 | The funding models we have in place are not sustainable. We need to focus on models that incentivize prevention, not just treatment. |
| | | | 5 | We can't just keep pouring money into hospitals. The community should be the first line of defence, and that requires a shift in funding. |
| | | | 6 | If we want to build a sustainable system, we have to rethink how we allocate our healthcare budget. More needs to go into primary care and prevention. |
| **Technology and Digital Solutions** | Leveraging Technology for Healthcare Delivery | Q6: What role should technology play in transforming healthcare? | 1 | Telehealth has so much potential, but we need the infrastructure to support it. We also need to ensure that patients know how to use these tools. |
| | | | 2 | We need to move beyond electronic health records to full digital solutions that allow for real-time data sharing and care coordination. |
| | | | 3 | Technology can help streamline care, but we need to focus on the outcomes it delivers, not just the process. |

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| | Investing in Digital Infrastructure | Q6: What infrastructure investments are required for technology to support healthcare? | 4 | Infrastructure investment is key. We need to ensure that all regions, especially rural areas, have the necessary tools to access telehealth and other digital healthcare services. |
| | | | 5 | To fully realize the benefits of telehealth and other digital solutions, we need to invest in broadband, hardware, and training for both providers and patients. |
| | | | 6 | The technology is there, but we need to invest in making it accessible and user-friendly for both healthcare professionals and patients. |
| **Leadership, Culture, and Change Management** | Driving Culture and Organisational Change | Q7: What role does culture play in the transformation of healthcare? | 1 | Changing the culture of healthcare organizations is key to making transformation work. It's not just about technology, it's about changing how people approach care. |
| | | | 2 | Leadership is the key to cultural change. Without strong leadership, the system will stay stuck in its old ways. |
| | | | 3 | We need to empower local communities, particularly Māori, to have a say in how healthcare is delivered. It's about respect and inclusion. |
| | Empowering Local Communities | Q7: How can local communities and stakeholders be involved in healthcare decision-making? | 4 | If we don't involve local communities in decision-making, any change we implement will fail. The healthcare system needs to reflect their needs. |
| | | | 5 | We've seen that involving indigenous communities in healthcare planning leads to better outcomes. It's time to make that the norm across the board. |
| | | | 6 | For real change to happen, communities need to feel like they have ownership of their healthcare. This is especially important for Māori and other marginalised groups. |
| **Continuous Improvement and Efficiency** | Simplifying Processes and Reducing Duplication | Q8: How can we make the healthcare system more efficient? | 1 | There's so much duplication in our current system. We need to streamline processes and eliminate unnecessary steps. |
| | | | 2 | Efficiency doesn't just come from cutting costs; it comes from doing things smarter. That means simplifying the patient journey and reducing the fragmentation of services. |
| | | | 3 | We need to adopt a continuous improvement mindset where we're |

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| | | | | always looking for ways to enhance the patient experience and outcomes. |
| | Embracing Innovation and Evidence-Based Practices | Q8: What role does innovation play in continuous improvement? | 4 | Innovation should be at the heart of our healthcare system. That means adopting new technologies and practices that have been proven to work. |
| | | | 5 | Healthcare providers need to be open to change and willing to embrace new, evidence-based practices. Without that mindset, improvement will be slow. |
| | | | 6 | The key to improvement is innovation, but it has to be supported by evidence. It's not enough to change for the sake of it; we need to focus on what works. |

# Appendix M: Symbiotic Healthcare Model – A Roadmap

## Part A: Operationalising the Model

The healthcare landscape is evolving rapidly, driven by technological advancements, shifting patient expectations, and the need for improved efficiency. The pipeline and platform models have emerged as two distinct paradigms, each with unique advantages and challenges. However, pursuing an ideal healthcare model necessitates transcending these paradigms by embracing a holistic approach that combines their strengths within a symbiotic network of healthcare entities. This section aims to provide a comprehensive blueprint for operationalising the ideal healthcare model that ensures equitable access, prioritises patient-centred care, promotes integration, and optimises the utilisation of shared resources.

The 10-step roadmap in Figure 1 encapsulates a visionary and systematic approach to realising the ideal healthcare model: a symbiotic network of healthcare entities that seamlessly combine pipeline and platform elements, offering equitable, patient-centred, integrated, and resource-shared care.

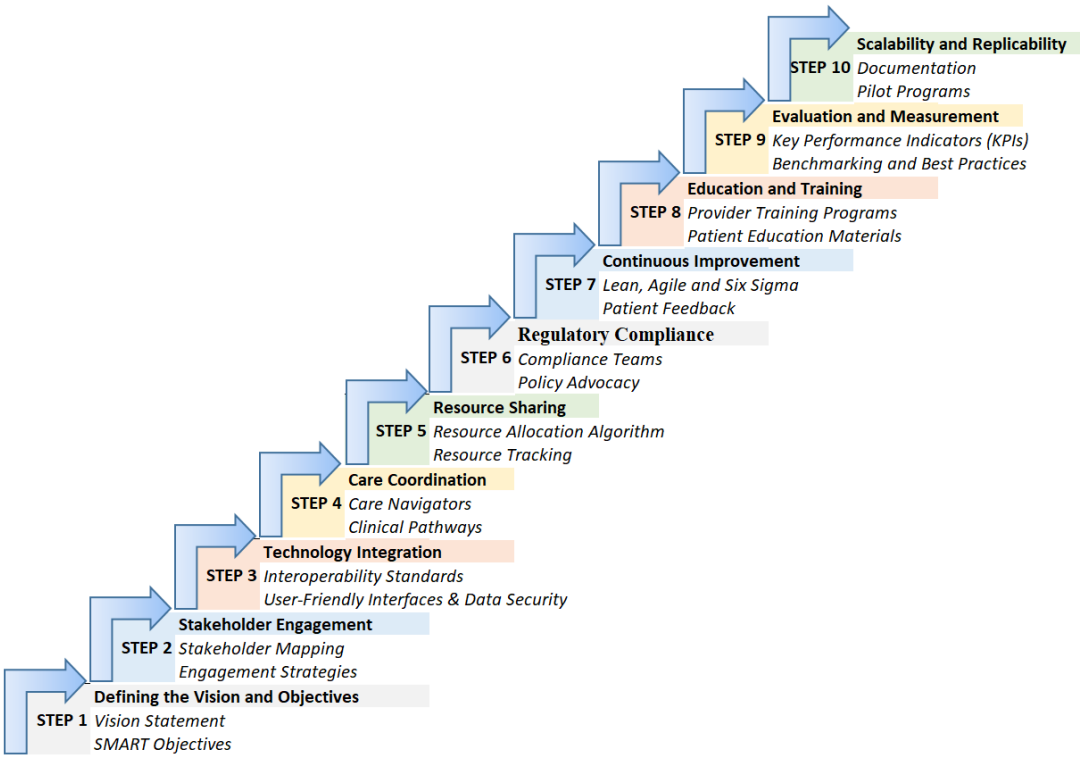


**Figure 1. Operationalising the ideal healthcare model**

Source: The Author

This roadmap, crafted through comprehensive research and stakeholder engagement, is the North Star guiding healthcare transformation. It envisions a future where the healthcare ecosystem flourishes in a harmonious blend of traditional and innovative models, ultimately achieving the pinnacle of quality, accessibility, and efficiency for the benefit of all.

The operational details of the 10-step roadmap are:

**1. Defining the Vision and Objectives:**

The ideal healthcare model envisions a healthcare ecosystem where every individual, regardless of socioeconomic status, geographic location, or pre-existing conditions, can access personalised, seamless, and holistic care. This vision rests upon equity, patient-centredness, integration, and resource sharing.

***Vision Statement:*** The vision statement for the ideal healthcare model is the guiding star that illuminates the path towards transformation. It encapsulates the model's core principles and vividly depicts the desired future. For example, it envisions a healthcare ecosystem where "*healthcare is a fundamental right, accessible to all, regardless of socioeconomic background, geographic location, or pre-existing health conditions.*"

***SMART Objectives:*** Specificity in setting objectives is paramount. Each objective should be specific in detailing what needs achieving, measurable in quantifiable terms, achievable within the model's capacity, relevant to the overarching vision, and time-bound to provide a clear timeframe for accomplishment. An example of a SMART objective could be: "Within five years, reduce healthcare disparities in underserved communities by at least 30% by enhancing access to preventive care and health education programs."

**2. Stakeholder Engagement**

***Stakeholder Mapping:*** Stakeholder mapping is a meticulous process that identifies and categorises the various stakeholders involved in the model. Primary stakeholders like patients and healthcare providers are at the heart of care delivery. Secondary stakeholders, including technology vendors and insurers, play supporting roles, while regulatory stakeholders, encompassing government agencies and accreditation bodies, wield authority over healthcare policies and standards.

***Engagement Strategies:*** Engaging diverse stakeholders is critical for the model's success, with strategies tailored to each stakeholder group. As primary stakeholders, patients engage actively through mechanisms like patient advisory councils, where they participate in decision-making processes related to their care.

Continuous education and training programs are implemented for healthcare providers to ensure their preparation for the model's transition. Collaborations with technology vendors focus on interoperability and innovation, fostering an ecosystem conducive to technological advancement. Regulatory stakeholders are engaged through policy advocacy, lobbying for reforms that align with the model's principles, such as advocating for changes in telehealth reimbursement policies to encourage adoption.

**3. Technology Integration**

***Interoperability Standards:*** Interoperability is the backbone of the ideal healthcare model. It ensures that diverse healthcare IT systems seamlessly communicate and share data. Adherence to recognised standards like HL7 (Health Level Seven) and FHIR (Fast Healthcare Interoperability Resources) is critical. These standards define the structure and semantics of healthcare data, enabling its consistent and meaningful exchange across different platforms and systems.

***User-Friendly Interfaces:*** User-friendly interfaces are essential for patients and healthcare providers to embrace the model. Incorporating usability principles offers intuitive navigation, responsive design for various devices, and accessibility features. Patient-facing platforms should empower individuals to manage appointments, access telehealth services, and securely share their health information. For healthcare providers, user-friendly interfaces facilitate efficient workflows and access to patient data, ultimately improving the quality of care.

***Data Security:*** Patient data security is non-negotiable in the healthcare model. Robust security measures safeguard sensitive information. Encryption mechanisms protect data both at rest and during transmission. Meticulously designed access controls ensure that only authorised personnel can access patient records. Audit trails provide transparency and accountability by tracking every interaction with patient data. The model aligns rigorously with privacy regulations, such as HIPAA (Health Insurance Portability and Accountability Act), to safeguard patient confidentiality and trust.

**4. Care Coordination:**

***Care Navigators:*** Care navigators are a linchpin of care coordination within the model. These dedicated professionals bridge patients and healthcare providers, ensuring that care is seamless, continuous, and tailored to individual needs. They facilitate communication and information exchange among healthcare entities, acting as patient advocates. Patients experience enhanced coordination and greater involvement in their care decisions by having a single point of contact.

***Clinical Pathways:*** Standardised clinical pathways are fundamental to achieving consistent, evidence-based care. These pathways define a set of best practices and protocols for diagnosing and treating common medical conditions. They guide healthcare providers in delivering care that aligns with the latest clinical guidelines, research findings, and quality standards. By reducing variations in care, clinical pathways contribute to improved outcomes, patient safety, and the efficient use of resources.

**5. Resource Sharing:**

***Resource Allocation Algorithm:*** Efficient resource allocation is a cornerstone of the ideal healthcare model, requiring a sophisticated resource allocation algorithm. This algorithm leverages real-time data on patient needs, resource availability, and historical utilisation patterns. The algorithm optimally allocates resources by analysing patient acuity, geographic distribution, and clinical expertise, including healthcare facilities, personnel, equipment, and virtual care capabilities like telehealth. This real-time approach minimises resource wastage and ensures patients receive timely care regardless of location.

***Resource Tracking:*** Resource tracking systems are instrumental in monitoring the availability and utilisation of shared resources. Real-time data on resource allocation and usage informs decisions about resource allocation, preventing bottlenecks and resource shortages. These systems continuously monitor the status of critical resources, providing insights into their utilisation rates and potential bottlenecks. Healthcare entities can make informed resource allocation and redistribution decisions by collating data from across the network. This data-driven approach ensures efficient, equitable resource allocation, improving patient outcomes and cost-effectiveness.

**6. Regulatory Compliance:**

***Compliance Teams:*** In an ever-evolving healthcare landscape, adherence to regulations is paramount. To navigate this complex terrain, the model establishes dedicated compliance teams. These teams are composed of experts well-versed in healthcare regulations, including data privacy laws, clinical standards, and reimbursement policies. They continuously monitor regulatory changes and ensure the model complies with all relevant requirements. This proactive approach mitigates legal risks and fosters trust among patients, providers, and regulatory bodies.

***Policy Advocacy:*** Advocacy is a proactive strategy the model employs to influence healthcare policy and regulation. Collaborating with industry associations, government agencies, and policymakers, the model advocates for policy changes that align with its principles. For instance, it may lobby for reforms in telehealth reimbursement policies to incentivise healthcare providers to embrace telemedicine. It may also

advocate for data-sharing regulations that balance patient privacy and the need for seamless information exchange. By actively shaping healthcare policies, the model ensures that the regulatory environment is conducive to its goals of equitable access, patient-centred care, integration, and resource sharing.

**7. Continuous Improvement:**

***Lean and Six Sigma:*** Continuous improvement is a foundational philosophy ingrained in the culture of the ideal healthcare model. It draws inspiration from methodologies such as Lean and Six Sigma. Healthcare entities within the model regularly engage in process analysis and optimisation. Root cause analysis identifies bottlenecks and inefficiencies in care delivery processes. By systematically eliminating waste, reducing unnecessary variation, and enhancing the efficiency of care pathways, the model ensures the judicious allocation of resources and that patients receive effective and efficient care.

***Patient Feedback:*** Systematic patient feedback utilises surveys, focus groups, and data analytics. This feedback serves as a driving force for continuous improvements in care quality, accessibility, and patient satisfaction. Patients are active partners in shaping their care experiences. Patients' insights into their care experiences, from appointment scheduling to the quality of clinical interactions, drive refinements in care delivery processes. Their voices shape the model's evolution, ensuring that care remains patient-centred and responsive to evolving needs.

**8. Education and Training:**

***Provider Training Programs****:* Providers are a linchpin of healthcare delivery, and their proficiency is crucial to the model's success. Comprehensive training equips them for the transition, covering a spectrum of topics, from proficient use of advanced technologies and electronic health records to adherence to clinical pathways and evidence-based practices. Providers are encouraged to embrace a culture of lifelong learning, ensuring that they remain at the forefront of healthcare innovation and best practices.

***Patient Education Materials:*** Empowering patients to participate actively in their care is a core principle of the model. To this end, comprehensive patient education materials encompass various topics, from health literacy to self-management strategies for chronic conditions. Easily accessible and understandable resources enable them to make informed decisions about their health. By enhancing health literacy and patient engagement, the model fosters a sense of ownership and responsibility among patients, ultimately leading to better health outcomes.

**9. Evaluation and Measurement:**

***Key Performance Indicators (KPIs):*** Measuring progress and performance is integral to the success of the ideal healthcare model. A carefully curated set of Key Performance Indicators (KPIs) is the compass for ongoing assessment, spanning diverse domains, offering a comprehensive view of the model's impact and effectiveness. Regular review of the KPIs aims to align with evolving goals and healthcare best practices, for instance, scrutiny of patient satisfaction and clinical outcomes for adherence to evidence-based practices, cost-effectiveness, and equity indicators.

***Benchmarking and Best Practices:*** The ideal healthcare model does not exist in isolation but is part of a broader healthcare ecosystem. As such, it actively benchmarks against best practices and peer organisations. By studying successful models and practices from around the world, the model gains insights into potential improvements and innovations. It ensures that it remains at the forefront of healthcare delivery and incorporates lessons learned from others. Benchmarking activities help identify areas where the model excels and areas that require further refinement and contribute to a continuous learning and excellence culture.

**10. Scalability and Replicability:**

***Documentation:*** Documenting every facet of the model's design, implementation, and refinement is crucial for scalability and replicability. This documentation serves as a blueprint for others who seek to adopt similar models in different contexts. It includes detailed protocols, best practices, lessons learned from pilot programs, and insights gained through benchmarking activities. The model ensures that its successes and innovations can be shared with the broader healthcare community by meticulously documenting processes. This documentation is a foundation for knowledge dissemination, facilitating the spread of the model's principles and practices.

***Pilot Programs:*** Before implementing large-scale, the model conducts pilot programs in smaller settings. These pilot programs serve as testbeds for the model's concepts and strategies and allow the identification of potential challenges, fine-tuning processes, and validating the model's effectiveness in real-world scenarios. Pilot programs involve diverse stakeholders, including patients, providers, and technology vendors, providing a comprehensive evaluation of the model's feasibility and impact. The lessons learned from pilot programs inform adjustments and refinements, ensuring a successful and efficient scale-up.

The operationalisation of the ideal healthcare model, a symbiotic network of healthcare entities, is a multifaceted and rigorous process. The ten steps are crucial in constructing a healthcare system, prioritising

equitable access, patient-centred care, integration, and resource sharing. By meticulously following these steps, stakeholders can collectively work towards a healthcare future where the best pipeline and platform models coexist harmoniously. This model bridges the gap between the traditional and the innovative, ensuring that individuals receive the highest quality care, regardless of their circumstances. Through collaboration, innovation, and unwavering commitment to continuous improvement, the vision of the ideal healthcare model can be turned into a tangible reality, benefiting patients and communities worldwide.

## Part B: Implementation

The ideal healthcare model is characterised by equitable access, patient-centred care, integration, and efficient resource allocation. Focusing on the barriers and enablers led to Figure 2, which presents a systematic and comprehensive ten-step implementation approach for achieving the ideal healthcare model.

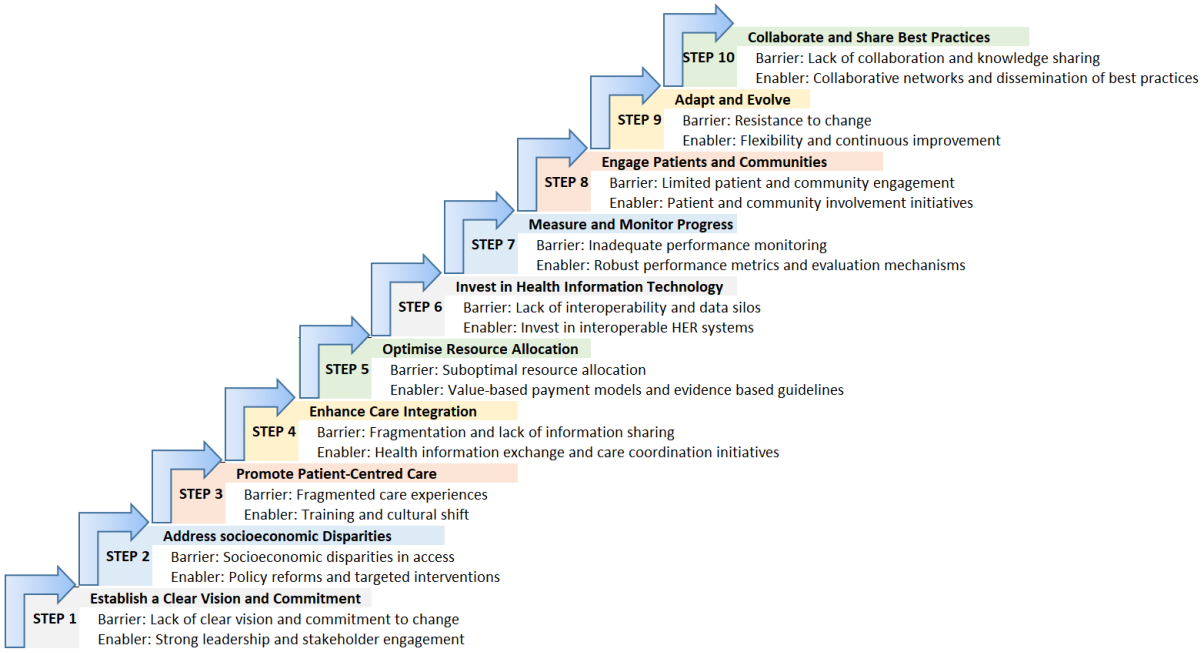


**Figure 2. Implementing the ideal healthcare model**

Source: The Author

### a) The 10 Steps: Barriers and Enablers

The critical steps and strategies for transforming the healthcare system to align with the ideal model are as follows:

**Step 1: Establish a Clear Vision and Commitment**

*Barrier: Lack of clear vision and commitment to change*

*Enabler: Strong leadership and stakeholder engagement*

The first step is establishing a clear and compelling vision for the ideal healthcare model. This vision should be rooted in equitable access, patient-centredness, integration, and efficient resource allocation and must be communicated effectively to all stakeholders, including policymakers, healthcare providers, and the public. Strong leadership within healthcare organisations and at the policy level is essential to drive this vision forward.

**Step 2: Address socioeconomic Disparities**

*Barrier: Socioeconomic disparities in access*

*Enabler: Policy reforms and targeted interventions*

Bridging the equitable access gap requires policymakers to prioritise socioeconomic disparities. It involves implementing policies that expand access to care for marginalised communities, providing subsidies or financial assistance for low-income individuals, and increasing the availability of healthcare services in underserved areas. Targeted interventions, such as community health programs and outreach initiatives, can further reduce disparities.

**Step 3: Promote Patient-Centred Care**

*Barrier: Fragmented care experiences*

*Enabler: Training and cultural shift*

To advance patient-centred care, healthcare organisations must invest in training healthcare providers in shared decision-making and communication skills. Requiring fostering is a cultural shift towards patient empowerment and engagement. Patient-centred care models, like the Patient-Centred Medical Home, can serve as a framework for delivering care that aligns with the ideal.

**Step 4: Enhance Care Integration**

*Barrier: Fragmentation and lack of information sharing*

*Enabler: Health information exchange and care coordination initiatives*

Enhanced care integration should focus on improving information sharing among healthcare providers. Establishing or expanding Health Information Exchange (HIE) systems will facilitate the secure and seamless exchange of patient data. Care coordination initiatives, supported by interdisciplinary teams and care transition protocols, can promote a unified approach to patient care.

**Step 5: Optimise Resource Allocation**

*Barrier: Suboptimal resource allocation*

*Enabler: Value-based payment models and evidence-based guidelines*

Resource allocation should transition away from fee-for-service models towards value-based payment structures that reward quality and outcomes rather than volume. Developing and implementing evidence-based clinical guidelines can guide resource allocation decisions, ensuring that resources are allocated efficiently based on patient needs.

**Step 6: Invest in Health Information Technology**

*Barrier: Lack of interoperability and data silos*

*Enabler: Invest in interoperable EHR systems*

Investing in interoperable electronic health record (EHR) systems is crucial to overcoming barriers related to data silos and interoperability. Standardisation of health data formats and protocols can facilitate the seamless exchange of patient information across healthcare settings and providers.

**Step 7: Measure and Monitor Progress**

*Barrier: Inadequate performance monitoring*

*Enabler: Robust performance metrics and evaluation mechanisms*

Robust performance metrics and evaluation mechanisms will help to ensure progress towards the ideal healthcare model. Key performance indicators related to equitable access, patient-centredness, care integration, and resource optimisation should be regularly measured and monitored. This data-driven approach allows for adjustments and improvements as needed.

**Step 8: Engage Patients and Communities**

*Barrier: Limited patient and community engagement*

*Enabler: Patient and community involvement initiatives*

Engaging patients and communities in healthcare decision-making processes is essential. Initiatives such as patient advisory councils, community health programs, and educational campaigns can empower individuals to participate in their healthcare and advocate for their needs actively.

**Step 9: Adapt and Evolve**

*Barrier: Resistance to change*

*Enabler: Flexibility and continuous improvement*

Recognise that achieving the ideal healthcare model is an ongoing process. Healthcare systems must remain flexible and adaptive, responding to changing patient needs, emerging technologies, and evolving best practices, requiring a continuous improvement and innovation culture within healthcare organisations.

**Step 10: Collaborate and Share Best Practices**

*Barrier: Lack of collaboration and knowledge sharing*

*Enabler: Collaborative networks and dissemination of best practices*

Collaboration among healthcare organisations and the sharing of best practices can accelerate progress. Collaborative networks, both at the regional and national levels, can facilitate knowledge exchange and the adoption of successful strategies. Disseminating case studies and success stories can inspire other organisations to replicate practical approaches.

Navigating the journey towards the ideal healthcare model, characterised by equitable access, patient-centred care, integration, and efficient resource allocation, requires a strategic roadmap that addresses identified barriers and leverages enablers. This roadmap outlines critical steps, from establishing a clear vision and commitment to fostering collaboration and continuous improvement. By following this roadmap, healthcare systems can move closer to realising the ideals of a healthcare model that prioritises the well-being of individuals and communities, ultimately leading to improved health outcomes for all.

The roadmap provided offers a structured approach to navigating this complex journey. However, exercising caution and adapting the roadmap to the specific context is crucial. This comprehensive guide expands on the recommendations for using the roadmap effectively, considering its limitations and the need for flexibility in implementation.

## b) Contextual Assessment

The first and foremost recommendation in using the roadmap for healthcare transformation is to conduct a comprehensive contextual assessment. Healthcare systems are highly diverse and shaped by many factors, such as geographic location, cultural norms, existing infrastructure, and healthcare policies. Understanding the context is paramount for tailoring the roadmap to a healthcare system's unique needs and challenges.

Healthcare systems differ significantly from one country to another, even from one region to another within the same country. The prevalence of diseases, demographics of the population, existing healthcare infrastructure, and cultural factors all play a role in shaping the healthcare landscape.

For example, a roadmap developed for a densely populated urban area may need to focus on issues such as congestion. In contrast, a roadmap for a rural region might emphasise strategies for addressing geographic barriers.

**Recommendation:**

- Engage in a thorough situational analysis that considers the current state of healthcare, including strengths, weaknesses, opportunities, and threats.
- Involve diverse stakeholders, including healthcare providers, patients, community leaders, and policymakers, in the assessment process to gain multiple perspectives.
- Prioritise data collection and analysis to inform decision-making. Data on healthcare utilisation, patient demographics, health outcomes, and resource allocation are essential for understanding the context.

## c) Stakeholder Engagement

The success of any healthcare transformation initiative hinges on the engagement and support of critical stakeholders. Involving a broad spectrum of stakeholders from the outset is crucial for customising the roadmap, building consensus, and ensuring commitment throughout the implementation process. Stakeholders in healthcare are varied and include healthcare providers, policymakers, patients, families, advocacy groups, and community organisations. Each group brings unique insights, priorities, and concerns to the table. Failure to engage stakeholders effectively can lead to resistance, misalignment, and, ultimately, the failure of transformation efforts.

**Recommendation**

- Establish a multidisciplinary and multi-stakeholder steering committee or task force responsible for overseeing the implementation of the roadmap.
- Conduct regular and inclusive stakeholder meetings or forums to gather input, share progress, and address concerns.
- Employ strategies for effective communication, such as clear and transparent reporting mechanisms, to keep stakeholders informed and engaged.

## d) Prioritisation

Attempting to address all identified barriers and enablers simultaneously may overwhelm a healthcare system with limited resources and capacity. Prioritisation is essential to ensure focused efforts are on areas that will significantly impact achieving the ideal healthcare model.

Healthcare systems typically operate under resource constraints, including budget limitations and workforce shortages. Prioritisation helps allocate resources effectively and ensures the most critical and feasible objectives. It also prevents the dilution of efforts across too many initiatives, which can lead to suboptimal outcomes.

**Recommendation:**

- Establish clear criteria for prioritisation, such as the potential impact on health outcomes, feasibility, and alignment with the overall vision.

- Engage stakeholders in the prioritisation process to ensure that decisions reflect a consensus on what to address first.
- Develop a phased implementation plan that outlines the sequence of initiatives, and their timelines based on prioritisation.

## e) Flexibility

A rigid adherence to a predefined roadmap can be counterproductive when unexpected challenges arise during implementation. Flexibility is crucial for changing circumstances and ensuring the roadmap remains relevant. The healthcare landscape is dynamic, characterised by evolving technologies, emerging trends, and shifting patient needs. Flexibility allows healthcare systems to respond promptly to emerging challenges and opportunities, making necessary course corrections as required.

**Recommendation:**

- Build flexibility into the roadmap by allowing for adjustments and refinements as circumstances evolve.
- Establish ongoing monitoring and feedback mechanisms to identify areas where the roadmap may need to be adapted.
- Encourage a culture of continuous improvement and learning within the healthcare organisation to foster adaptability.

## f) Continuous Evaluation

Healthcare systems must implement robust monitoring and evaluation mechanisms to gauge progress and the effectiveness of the roadmap's strategies. Regularly reviewing key performance indicators and outcomes is essential to determine whether the roadmap's strategies achieve the desired impact.

Evaluation provides a means to assess whether the implemented initiatives produce the intended results and helps identify areas for improvement. It also serves as a basis for accountability and transparency, ensuring stakeholders are informed about the impact of transformation efforts.

**Recommendation**

- Establish a comprehensive framework for performance measurement that includes relevant metrics and indicators for each aspect of the roadmap.

- Ideally, independent evaluators or teams should conduct regular evaluations to provide unbiased progress assessments.
- Use evaluation findings as a basis for informed decision-making, making necessary adjustments to strategies or initiatives.

## g) Cultural Sensitivity

Transformation efforts often involve shifts in organisational culture and practices. Healthcare organisations should recognise the importance of cultural sensitivity and awareness to ensure a smoother transition and acceptance of new practices. Organisational culture is pivotal in shaping how healthcare providers and staff deliver care. Changes to care delivery models, communication practices, and patient engagement approaches may meet with resistance if they clash with the existing culture.

**Recommendation**

- Conduct cultural assessments within healthcare organisations to understand the current culture and identify areas for alignment with the roadmap.
- Develop strategies for promoting cultural sensitivity and cultural competence among healthcare providers.
- Recognise that cultural change is a gradual process and may require ongoing efforts, including training and education.

## h) Resource Allocation

Efficient resource allocation is critical for implementing the initiatives outlined in the roadmap. Healthcare systems must ensure adequate resources, including financial and personnel, are allocated to support transformation efforts. Insufficient resource allocation can hinder progress and lead to implementation challenges. Sufficient resources are necessary to support healthcare providers' training, invest in health information technology, and sustain ongoing initiatives.

**Recommendation:**

- Conduct a thorough resource assessment to determine the financial, human, and technological resources required for each initiative within the roadmap.
- Advocate for budget allocations and secure funding sources to support transformation efforts.

- Prioritise resource allocation based on the initiatives' potential for impact and alignment with the roadmap's overarching goals.

## i) Pilot Initiatives

Before scaling up initiatives across the healthcare system, consider piloting specific strategies or interventions in a controlled environment. Pilots allow for testing and refining approaches before full implementation. Pilots provide an opportunity to identify potential challenges, assess the feasibility of initiatives, and gather real-world data on their impact. They also allow for adjustments and improvements based on lessons learned during the pilot phase.

**Recommendation**

- Select a representative sample or a specific healthcare facility to serve as a pilot site for testing initiatives.
- Develop a robust evaluation plan for the pilot, including key performance indicators and data collection methods.
- Use pilot findings to inform strategies refinement and rollout to a broader scale.

## j) Learning from Others

Learning from the experiences of other healthcare systems that have undertaken similar transformations can provide valuable insights and guidance. Case studies and best practice sharing can inform decision-making and improve the effectiveness of roadmap implementation. Healthcare systems worldwide face common challenges and can benefit from each other's successes and failures. Learning from others accelerates the adoption of evidence-based practices and can help healthcare systems avoid common pitfalls.

**Recommendation:**

- Establish knowledge-sharing mechanisms and collaboration with other healthcare organisations locally and internationally.
- Participate in healthcare networks, forums, and conferences where experiences and best practices are shared.

- Consider partnerships or collaborations with organisations that have successfully implemented similar initiatives.

## k) Caution in Policy Changes

If the roadmap involves policy changes, it is essential to approach them with caution and thorough analysis. Policymakers should conduct a rigorous policy analysis process, considering potential unintended consequences and soliciting stakeholder feedback. Policy changes can have far-reaching implications for healthcare systems, providers, and patients. Unintended consequences, such as disruptions in care delivery or unintended incentives, can occur if policies are not comprehensive.

**Recommendation:**

- Engage policy experts and conduct policy impact assessments to understand the potential consequences of proposed changes.
- Seek input and feedback from various stakeholders, including healthcare providers, patients, advocacy groups, and policymakers.
- Pilot policy changes in a limited scope or carefully phase them in to monitor their effects before full-scale implementation.

## l) Communication

Effective communication is a linchpin for successful roadmap implementation. Clear and transparent communication ensures stakeholders are well-informed about progress, challenges, and successes, fostering trust and engagement. Communication serves as a vehicle for conveying the roadmap's vision, goals, and strategies. It also provides a means for addressing concerns, soliciting input, and maintaining open lines of dialogue with stakeholders.

**Recommendation:**

- Develop a communication plan that outlines key messages, target audiences, communication channels, and timelines.
- Engage in regular and transparent reporting on progress, challenges, and outcomes to keep stakeholders informed.

- Encourage two-way communication, allowing stakeholders to provide feedback and express concerns.

## m) Ethical Considerations

All actions taken as part of the roadmap should prioritise ethical considerations. Ethical principles, such as patient autonomy, beneficence, non-maleficence, and justice, should underpin decisions and practices throughout the transformation process. Healthcare is fundamentally a field grounded in ethics. Every decision, from resource allocation to patient care, carries ethical implications. Prioritising ethical considerations ensures that decisions align with the values of patient well-being, equity, and individual rights.

**Recommendation:**

- Establish an ethics committee or consult with ethicists to guide challenging ethical dilemmas that may arise.
- Ensure ethical principles are integrated into decision-making frameworks, policies, and clinical guidelines.
- Promote a culture of ethical reflection and dialogue within healthcare organisations.

## n) Address Resistance

Resistance to change is a common challenge in healthcare transformation efforts. Resistance can come from various stakeholders, including healthcare providers, administrators, and patients who may be hesitant about the proposed transformations. Resistance often stems from fear of the unknown, concerns about job security, and the perception of added complexity. It can manifest as reluctance to adopt new practices, scepticism about the benefits of change, or outright opposition to transformation initiatives.

**Recommendation:**

- Conduct change management training for healthcare leaders to equip them with strategies for addressing resistance.
- Engage actively with resistant stakeholders to understand their concerns and provide information and reassurance.

- Communicate the benefits and positive outcomes of the roadmap's initiatives to build support and alleviate concerns.

## o) Iterative Approach

The implementation of the roadmap is an iterative process. Healthcare systems must remain open to learning from experiences, improving, and redefining strategies. The journey towards the ideal healthcare model is ongoing and requires a commitment to continuous improvement. Iteration acknowledges that the transformation of healthcare systems is not a one-time event but a dynamic process. It concedes that initial strategies may require adjustments based on feedback, evolving best practices, and changing circumstances.

**Recommendation:**

- Establish mechanisms for ongoing review and evaluation of initiatives, with the flexibility to adjust as needed.
- Encourage a culture of learning and innovation within healthcare organisations, where feedback and continuous improvement are valued.
- Regularly convene stakeholders to assess progress, share lessons learned, and identify opportunities for refinement.

The recommendations provided in this comprehensive guide emphasise the importance of contextual assessment, stakeholder engagement, prioritisation, flexibility, continuous evaluation, cultural sensitivity, resource allocation, piloting, learning from others, caution in policy changes, communication, ethical considerations, addressing resistance, and adopting an iterative approach. By following these recommendations, healthcare systems can navigate the transformation journey more effectively, increasing the likelihood of success and ultimately moving closer to the realisation of the ideal healthcare model that prioritises the well-being of individuals and communities. Such a model promises improved health outcomes, equity, and a more resilient healthcare system.

## p) Value streams and cohorts

The concept of value streams and cohorts flowing through a new symbiotic model of care represents a holistic approach to healthcare delivery that emphasises collaboration, patient-centric care, and the efficient allocation of resources. This model recognises that healthcare is a complex ecosystem involving multiple

stakeholders, including patients, healthcare providers, payers, and technology partners, and aims to optimise care delivery by aligning their efforts.

In the symbiotic model of care, value streams efficiently deliver high-quality care. This involves streamlining processes, reducing redundant tests and procedures, and ensuring that care is timely and appropriate.

Cohorts segment patient populations based on various factors, such as age, condition, risk factors, and social determinants of health. This segmentation allows healthcare providers to tailor interventions and resources to specific cohorts. For example, a cohort of elderly patients with chronic conditions may receive home-based care and remote monitoring, while a cohort of pregnant women may receive specialised prenatal care.

By aligning value streams with the unique needs of patient cohorts, the symbiotic model of care can lead to improved outcomes, increased patient satisfaction, and cost savings. It also promotes the continuous use of data and analytics to refine and optimise care pathways for different cohorts.

## q) Value Streams in Healthcare

Value streams in healthcare refer to the sequence of activities or processes that collectively provide value to patients and other stakeholders in the healthcare system. These activities often involve the flow of information, resources, and patients through various care stages. Value stream mapping, a lean methodology, identifies and optimises these processes to eliminate waste and improve efficiency.

In a symbiotic model of care, value streams could represent the pathways that patients follow when seeking care, from initial symptoms and diagnosis to treatment and follow-up. By optimising these value streams, healthcare organisations can enhance patient experiences, reduce costs, and improve overall outcomes.

- **Definition:** Value streams in healthcare refer to the sequences of activities and processes involved in delivering value to patients. They encompass all the steps, from initial patient contact to care delivery and follow-up. The goal is to streamline these processes to minimise waste and maximise value.
- **Importance:** In a symbiotic model of care, value streams are crucial for improving the overall patient experience, reducing costs, and enhancing the quality of care. By mapping and optimising value streams, healthcare organisations can identify bottlenecks and inefficiencies, leading to better resource allocation and patient outcomes.

- **Examples of Value Streams:**
  - **Chronic Disease Management:** A value stream for managing chronic diseases might include patient education, regular check-ups, medication management, and lifestyle counselling.
  - **Emergency Care:** An emergency care value stream may involve triage, diagnostic tests, treatment, and post-treatment follow-up.

## r) Cohorts in Healthcare

Cohorts in healthcare represent groups of patients who share similar characteristics or conditions. Cohort-based care allows healthcare providers to tailor their approaches to specific patient populations, considering their unique needs, risks, and preferences. This approach can improve outcomes and patient satisfaction by delivering more personalised care.

In a symbiotic care model, cohorts might represent different patient populations or segments that receive care within this model. These cohorts could be defined based on age, medical conditions, geographic location, or specific needs. Understanding these cohorts' unique requirements and preferences can help healthcare providers tailor their services and interventions.

- **Definition:** In healthcare, cohorts refer to groups of patients who share similar characteristics or conditions. Cohort-based care allows healthcare providers to tailor their approaches and interventions to the specific needs of each group.
- **Importance:** Cohort-based care recognises that not all patients are the same, and one-size-fits-all approaches may not be practical. By grouping patients into cohorts based on diagnoses, risk factors, or demographics, healthcare providers can design more targeted and personalised care plans.

**Examples of Cohorts:**

- **Diabetic Patients:** A cohort of diabetic patients would receive care plans tailored to their needs, including regular glucose monitoring, medication adjustments, and dietary guidance.
- **Geriatric Population:** Older persons may form a cohort with distinct healthcare needs, including fall prevention, medication management, and cognitive health assessments.

# Appendix N: Validation Questionnaire

**Code #: XXX**

## A New Healthcare Model for New Zealand (Validation Survey)

This survey aims to assess the validity of a transformational healthcare model for New Zealand that challenges the sector to think beyond cost-cutting and piecemeal improvement initiatives. Your feedback on this new healthcare model and its implementation roadmap will help us fine-tune them.

**Section 1** **Characteristics of MY Ideal Healthcare System for New Zealand**

1. Please indicate your agreement with each statement by highlighting a suitable number in each row.

| | | Strongly agree | | Somewhat agree | | Strongly disagree | Don't Know |
|---|---|---|---|---|---|---|---|
| | **The guiding principles for MY ideal healthcare system are:** | **5** | **4** | **3** | **2** | **1** | **0** |
| 1 | Equitable access to health services for all eligible individuals: A system that is equitable and accessible to anyone requiring healthcare anywhere | 5 | 4 | 3 | 2 | 1 | 0 |
| 2 | Patient-centred care: A system that truly puts patient needs at the heart of everything it does | 5 | 4 | 3 | 2 | 1 | 0 |
| 3 | Integration: An integrated system overall, where each locality contains a fully resourced and integrated health hub | 5 | 4 | 3 | 2 | 1 | 0 |
| 4 | Resource sharing: A system in which the healthcare arrangement contains a pool of resources that is accessible to everyone | 5 | 4 | 3 | 2 | 1 | 0 |
| 5 | Other (please specify): | | | | | | |

2. Please indicate your agreement with each statement by highlighting a suitable number in each row.

| | **In MY ideal healthcare system:** | **Strongly agree** 5 | 4 | **Somewhat agree** 3 | 2 | **Strongly disagree** 1 | **Don't Know** 0 |
|---|---|---|---|---|---|---|---|
| **1** | Patients can seamlessly access care, schedule appointments, access digital services like telehealth, and securely share their health data with providers | 5 | 4 | 3 | 2 | 1 | 0 |
| **2** | Resource allocation is optimised through real-time tracking and allocation algorithms, maximising efficiency and minimising waste | 5 | 4 | 3 | 2 | 1 | 0 |
| **3** | Dedicated care navigators facilitate comprehensive care coordination, and clinical pathways provide evidence-based treatment guidance, ensuring consistent and high-quality care | 5 | 4 | 3 | 2 | 1 | 0 |
| **4** | Patient feedback and evidence-based decision-making drive continuous improvement. Strict compliance with healthcare regulations and active advocacy for supportive policies | 5 | 4 | 3 | 2 | 1 | 0 |
| **5** | Education programs empower providers and patients to make informed care decisions together. Performance is consistently measured against KPIs and benchmarked against best healthcare practice | 5 | 4 | 3 | 2 | 1 | 0 |
| **6** | Pilot programs and well-documented processes enable system scalability | 5 | 4 | 3 | 2 | 1 | 0 |
| **7** | Stakeholders, including patients, healthcare providers, payers, and technology companies, collaborate to achieve superior health outcomes | 5 | 4 | 3 | 2 | 1 | 0 |
| **8** | Partnerships between healthcare providers, patients, and other stakeholders are the norm | 5 | 4 | 3 | 2 | 1 | 0 |
| **9** | Healthcare providers share available resources | 5 | 4 | 3 | 2 | 1 | 0 |
| **10** | Shared decision-making and coordination across the healthcare disciplines add value to the patient and provider experience | 5 | 4 | 3 | 2 | 1 | 0 |
| **11** | Other (please specify): | | | | | | |

3. Please indicate your agreement with each statement by highlighting a suitable number in each row.

| | **In MY ideal healthcare system, tailored care plans:** | **Strongly agree** 5 | 4 | **Somewhat agree** 3 | 2 | **Strongly disagree** 1 | **Don't Know** 0 |
|---|---|---|---|---|---|---|---|
| **1** | Provide a patient-centric focus to prioritise patient needs and preferences | 5 | 4 | 3 | 2 | 1 | 0 |
| **2** | Involve cohorts - specific patient groups with unique needs - to identify cost-effective interventions | 5 | 4 | 3 | 2 | 1 | 0 |
| **3** | Utilise extensive data sharing, including electronic health records, patient data from wearables, and real-time communication between care team members | 5 | 4 | 3 | 2 | 1 | 0 |
| **4** | Make use of integrated service delivery | 5 | 4 | 3 | 2 | 1 | 0 |
| **5** | Are continuously improved to give more personalised care and improve patient satisfaction and health outcomes | 5 | 4 | 3 | 2 | 1 | 0 |

4. Combining the strengths of the traditional health 'pipeline' model with those of the 'platform' model (think Uber) led us to the hybrid arrangement shown in Figure 1, which dynamically connects supply and demand. The benefits of establishing such a symbiotic network of healthcare entities that provides standardised care while preserving flexibility are manifold and potentially transformative and include:

   - Holistic, patient-centred care
   - Customised care plans
   - Optimised resource allocation
   - Data-driven insights
   - Interdisciplinary collaboration
   - Resource sharing
   - Innovation and adaption…

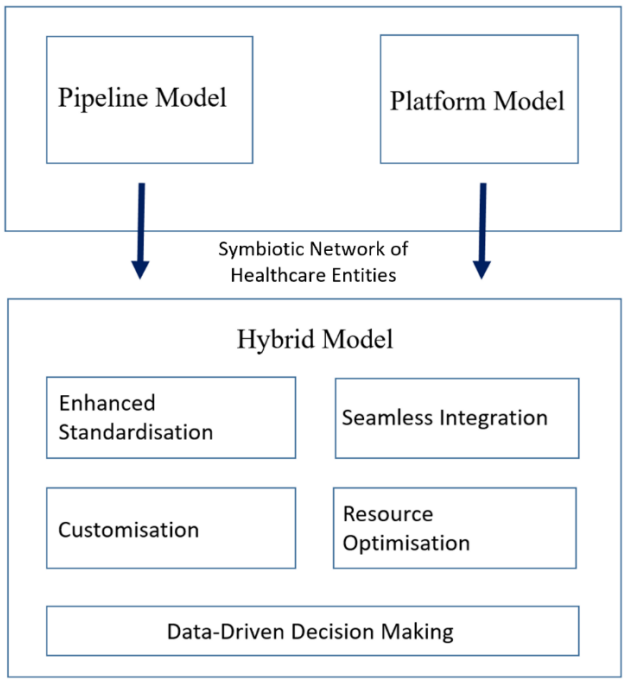


**Figure 1. Proposed symbiotic network ecosystem**

| **If you have suggestions for IMPROVING the model indicated in Figure 1, please add them here. We are interested in capturing your opinions, experiences and values.** |
| --- |
| |

## Section 2 Governing the Proposed Healthcare System

5. The cause-effect diagram shown in Figure 2 (from the last Delphi round) indicates the significant factors influencing the implementation and maintenance of such a system. *Change Readiness* and *Strategic Intent* are the two most crucial causal factors. *Appetite for Change* is also essential, given its considerable effect on the overall system. Consequently, realising the vision of the symbiotic network necessitates careful deployment of:

    - Standardised protocols
    - Interoperability
    - Resources allocation algorithms
    - Data governance
    - Continuous evaluation and improvement
    - Education and training…

| **If you have any observations or questions concerning the relational diagram in Figure 2, please add them here. We are interested in capturing your opinions, experiences and values.** |
| --- |
| |

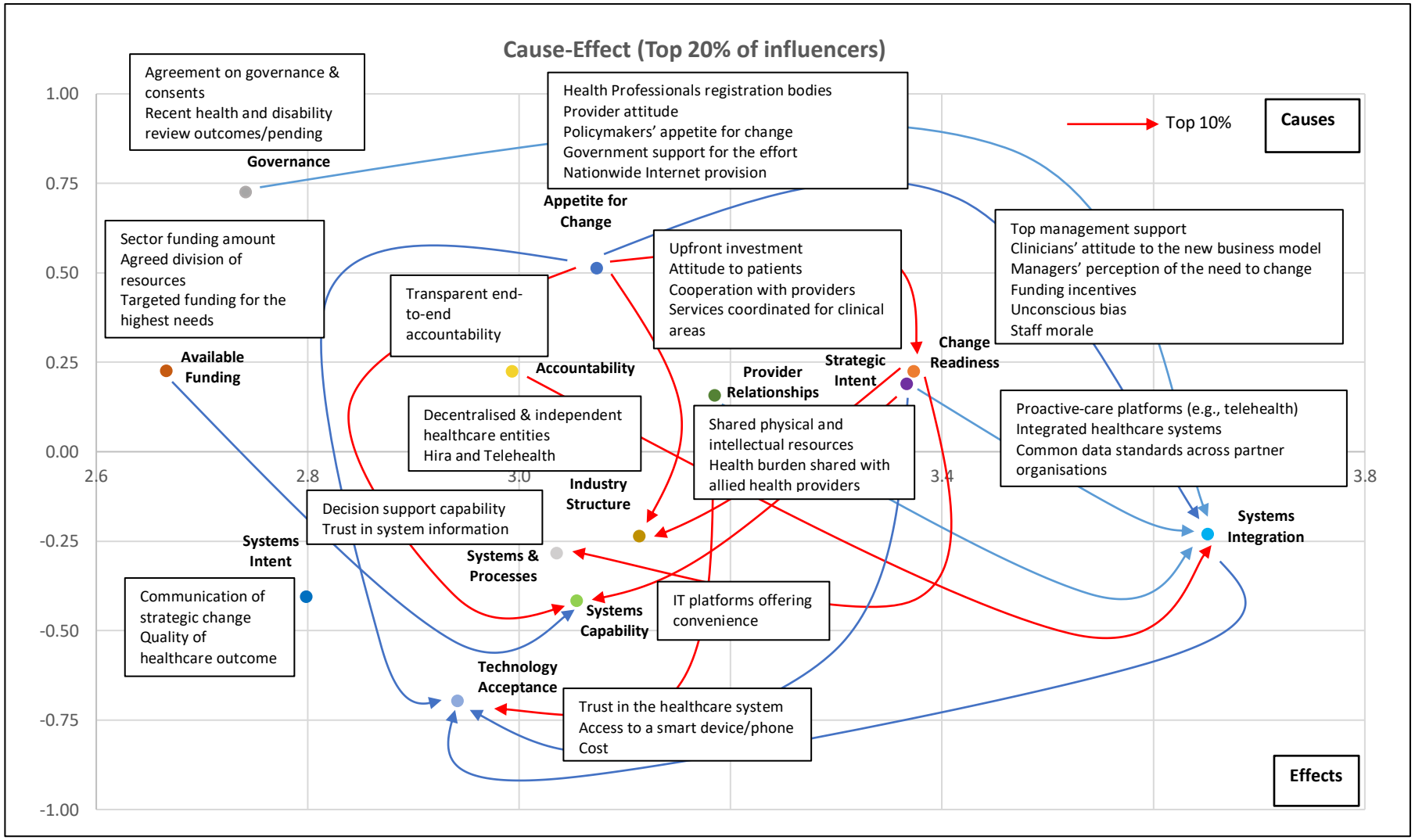


**Figure 2. Relational diagram for the ideal healthcare system**

## Section 3 Achieving the Proposed Healthcare System

6. These and other considerations led to the 10-step roadmap shown in Figure 3, a systematic approach for turning New Zealand's healthcare system into a symbiotic network of healthcare entities that seamlessly integrates pipeline and platform elements to offer equitable, patient-centred, integrated, and resource-shared care.

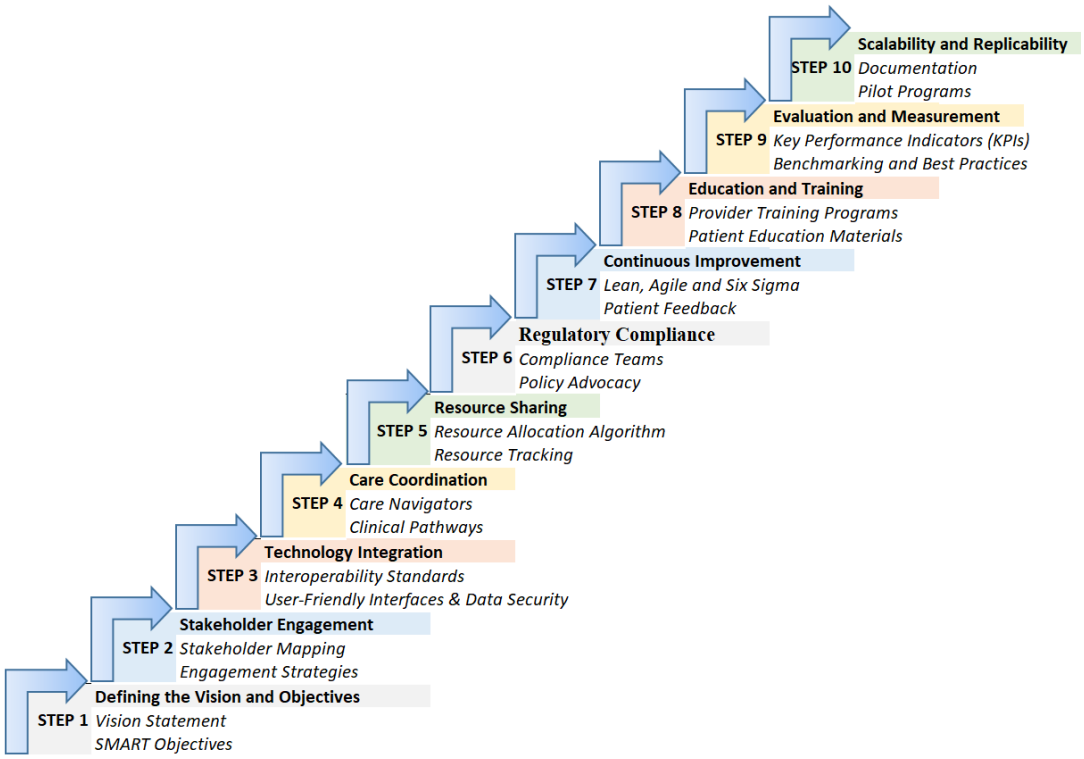


**Figure 3. Operationalising the proposed healthcare model**

| **If you have suggestions for amending the 10-step roadmap shown in Figure 3, please add them here. We are interested in capturing your opinions, experiences and values.** |
| --- |
| |

7. By focusing on the barriers and enablers, these considerations also led to the 10-step roadmap in Figure 4, which presents a systematic and comprehensive implementation approach for successfully achieving the 'ideal' healthcare model.

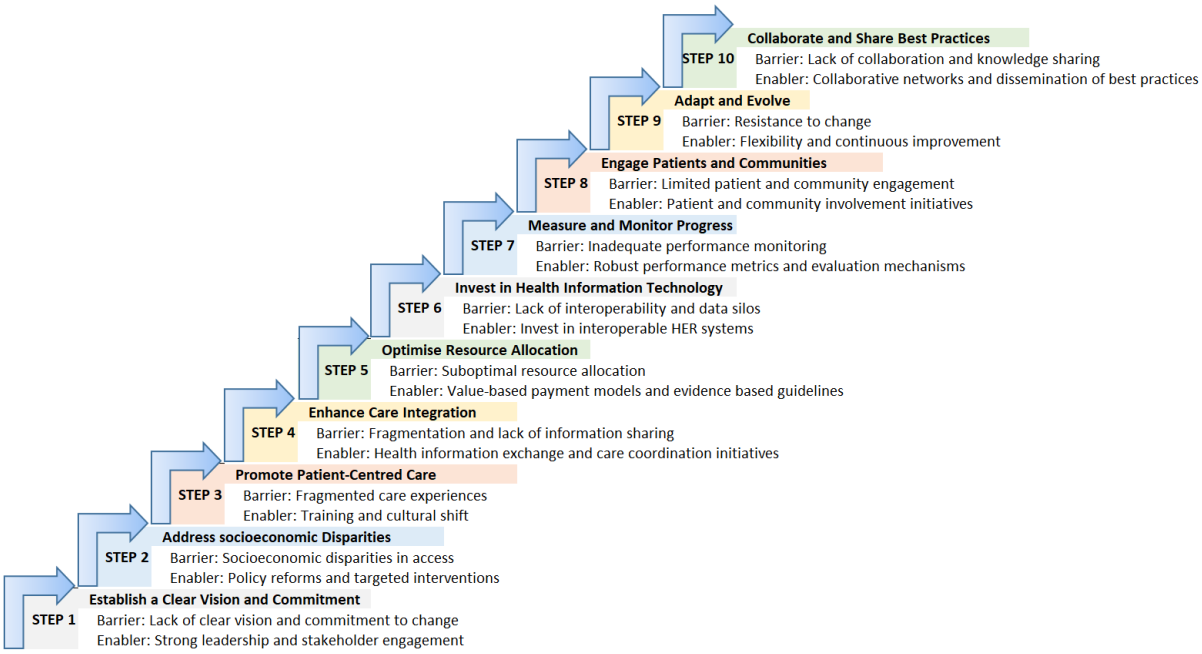


**Figure 4. Implementing the proposed healthcare model**

| **If you have suggestions for amending the 10-step roadmap shown in Figure 4, please add them here. We are interested in capturing your opinions, experiences and values.** |
| --- |
| |

These diagrams provide practical frameworks for healthcare leaders, policymakers, and practitioners. They will help create and maintain a symbiotic network that leverages the strengths of pipeline and platform models to deliver comprehensive, patient-centred care.

8. **Final Thoughts**

| **If you have any final questions or observations about this study, please add them here:** |
| --- |
| |

We would greatly appreciate it if you could email this completed form by Monday, 23rd September.

**Questions?**

Contact the Research Supervisor (eric.deakins@.waikato.ac.nz)

***Once again, we thank you most sincerely for your time.***

## Reflections on the PhD journey

Having successfully defended the thesis and been awarded my PhD, I find myself reflecting on a journey that has been as transformative as it has been challenging — a journey marked by deep inquiry, critical reflection, and profound personal growth. It has been a process of unfolding curiosity into structured understanding, turning questions into insights, and ideas into impact.

This journey began with a simple but compelling question: "How can we better design healthcare systems to serve diverse populations equitably and sustainably?" What started as an academic curiosity evolved into a mission to contribute meaningfully to the field of public healthcare transformation. As I navigated the complexities of systems thinking, stakeholder dynamics, and causal relationships, I found myself increasingly drawn to the human side of change — the stories, struggles, and aspirations of those who shape and are shaped by our health systems.

The path to this achievement was far from linear. From the early stages of methodological design to the ethical considerations of human-centred research, each phase presented its own set of challenges. Triangulating diverse perspectives, validating data through member checking, and refining my conceptual framework required both technical rigour and emotional resilience. Yet, each obstacle became an opportunity for deeper learning, reinforcing my commitment to rigour, transparency, and impact.

Central to this journey has been the support of an inspiring academic community. Conversations with mentors, peers, and fellow researchers have broadened my perspective, challenged my assumptions, and enriched my work. These interactions reminded me that research is not a solitary pursuit, but a collaborative effort grounded in shared curiosity and collective insight. I am particularly grateful for the guidance of my supervisors, whose belief in my potential pushed me to achieve more than I initially imagined possible.

This PhD journey has not just tested my intellectual limits but also reshaped my sense of self. I have grown as a thinker, a writer, and a leader. The moments of doubt — when imposter syndrome threatened to derail my progress or when analysis paralysis set in — taught me the value of perseverance, self-compassion, and staying true to one’s purpose. These moments of struggle were, in hindsight, the crucibles for my most significant breakthroughs.

As I stand at the threshold of a new chapter, I am deeply proud of this achievement, but equally aware that this is just the beginning. My thesis, centred on a symbiotic model for healthcare transformation, has laid the groundwork for future inquiry, collaboration, and impact. It has given me a platform to

engage with policy leaders, health professionals, and communities in reimagining a more equitable, integrated, and resilient healthcare system.

I am profoundly grateful to my supervisors, colleagues, family, and friends for their unwavering support and the countless health professionals who generously shared their insights, helping shape this work. Their trust, openness, and belief in the potential for meaningful change have been my greatest motivation.

As I reflect on this journey, I am reminded that the pursuit of knowledge is not just about discovering facts but about making a difference. It is about creating value, inspiring others, and contributing to a shared vision of a healthier, more connected world.

Thank you for being part of this journey. Here's to the next chapter.